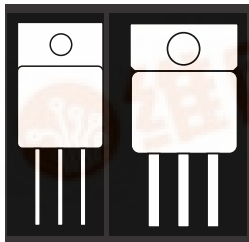


OM55N10SC OM60N10SC OM75N05SC OM75N06SC  
OM55N10SA OM75N05SA OM75N06SA

## LOW VOLTAGE, LOW $R_{DS(on)}$ POWER MOSFETS IN HERMETIC ISOLATED PACKAGE



50V, 60V, And 100V Ultra Low  $R_{DS(on)}$   
Power MOSFETs In TO-254 And TO-258  
Isolated Packages

### FEATURES

- Isolated Hermetic Metal Packages
- Ultra Low  $R_{DS(on)}$
- Low Conductive Loss/Low Gate Charge
- Available Screened To MIL-S-19500, TX, TXV And S Levels
- Ceramic Feedthroughs available

### DESCRIPTION

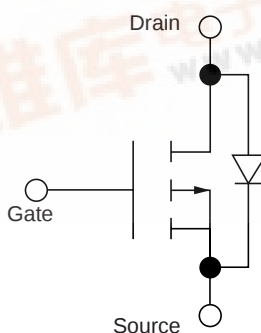
This series of hermetic packaged MOSFETs are ideally suited for low voltage applications; battery powered voltage power supplies, motor controls, dc to dc converters and synchronous rectification. The low conduction loss allows smaller heat sinking and the low gate change simpler drive circuitry.

### MAXIMUM RATINGS (Per Device)

| PART NO.  | $V_{DS}$ (V) | $R_{DS(on)}$ ( ) | $I_D$ (A) | Package  |
|-----------|--------------|------------------|-----------|----------|
| OM60N10SC | 100          | .025             | 60        | TO-258AA |
| OM55N10SC | 100          | .030             | 55        | TO-258AA |
| OM55N10SA | 100          | .035             | 55        | TO-254AA |
| OM75N06SC | 60           | .016             | 75        | TO-258AA |
| OM75N06SA | 60           | .018             | 75        | TO-254AA |
| OM75N05SC | 50           | .016             | 75        | TO-258AA |
| OM75N05SA | 50           | .018             | 75        | TO-254AA |

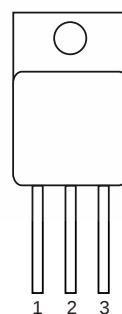
3.1

### SCHEMATIC



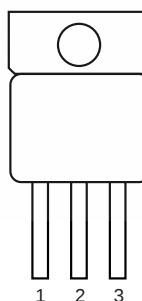
### PIN CONNECTION

TO-254AA



Pin 1: Drain  
Pin 2: Source  
Pin 3: Gate

TO-258AA



Pin 1: Drain  
Pin 2: Source  
Pin 3: Gate

OM55N10SA - OM75N06SC

ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted)

| Parameter                                       |                                             | 60N10SC    | 55N10SA<br>55N10SC | 75N06SA<br>75N06SC | 75N05SA<br>75N05SC | Units |
|-------------------------------------------------|---------------------------------------------|------------|--------------------|--------------------|--------------------|-------|
| V <sub>DS</sub>                                 | Drain-Source Voltage                        | 100        | 100                | 60                 | 50                 | V     |
| V <sub>DGR</sub>                                | Drain-Gate Voltage (R <sub>GS</sub> = 1 M ) | 100        | 100                | 60                 | 50                 | V     |
| I <sub>D</sub> @ T <sub>C</sub> = 25°C          | Continuous Drain Current <sup>2</sup>       | 60         | 55                 | 75                 | 75                 | A     |
| I <sub>D</sub> @ T <sub>C</sub> = 100°C         | Continuous Drain Current <sup>2</sup>       | 37         | 33                 | 45                 | 45                 | A     |
| I <sub>DM</sub>                                 | Pulsed Drain Current <sup>1</sup>           | 180        | 180                | 225                | 225                | A     |
| P <sub>D</sub> @ T <sub>C</sub> = 25°C          | Maximum Power Dissipation                   | 130        | 125                | 125                | 125                | W     |
| P <sub>D</sub> @ T <sub>C</sub> = 100°C         | Maximum Power Dissipation                   | 55         | 50                 | 50                 | 50                 | W     |
| Junction-To-Case                                | Linear Derating Factor                      | 1.00       | 1.00               | 1.00               | 1.00               | W/°C  |
| T <sub>J</sub>                                  | Operating and                               | -55 to 150 | -55 to 150         | -55 to 150         | -55 to 150         | °C    |
| T <sub>stg</sub>                                | Storage Temperature Range                   |            |                    |                    |                    |       |
| Lead Temperature (1/16" from case for 10 secs.) |                                             | 300        | 300                | 300                | 300                | °C    |

1 Pulse Test: Pulse width 300 µsec. Duty Cycle 1.5%.  
2 Package Limited: SA I<sub>b</sub> = 25A & SC I<sub>b</sub> = 35A @ 25°C

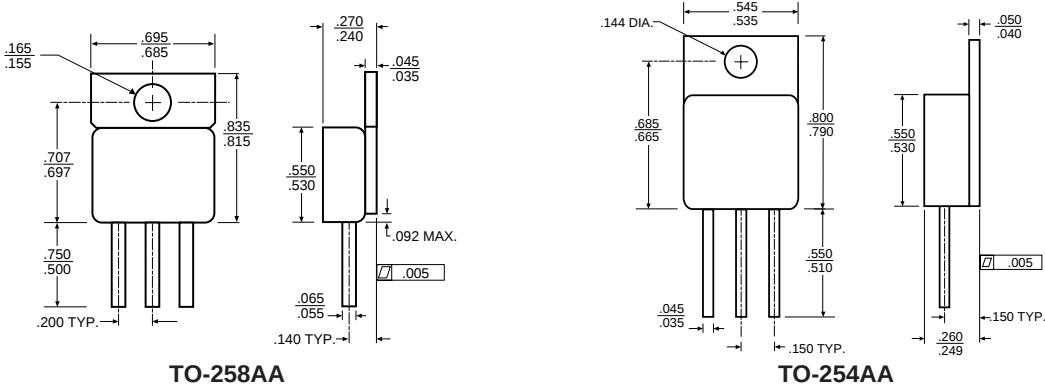
THERMAL RESISTANCE

|                   |                  |     |      |
|-------------------|------------------|-----|------|
| R <sub>thJC</sub> | Junction-to-Case | 1.0 | °C/W |
|-------------------|------------------|-----|------|

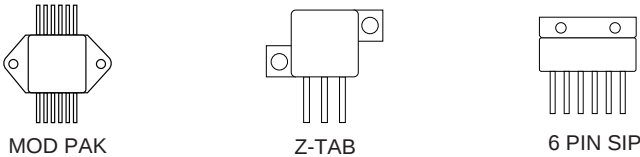
PACKAGE LIMITATIONS

| Parameters        |                                                              | TO254AA | TO-258AA | Unit |
|-------------------|--------------------------------------------------------------|---------|----------|------|
| I <sub>D</sub>    | Continuous Drain Current                                     | 25      | 35       | A    |
|                   | Linear Derating Factor, Junction-to-Ambient                  | .020    | .025     | W/°C |
| R <sub>thJA</sub> | Thermal Resistance, Junction-to-Ambient (Free Air Operation) | 50      | 40       | °C/W |

MECHANICAL OUTLINE



PACKAGE OPTIONS



Note: MOSFETs are also available in Z-Tab, dual and quad pak styles. Duals and quads available in non-gate versions only. Please call the factory for more information.

# OM60N10SC (T<sub>C</sub> = 25°C unless otherwise specified)

| Avalanche Characteristics                       |                                                       | Min. | Typ. | Max.          | Units | Test Conditions                                                                                                       |
|-------------------------------------------------|-------------------------------------------------------|------|------|---------------|-------|-----------------------------------------------------------------------------------------------------------------------|
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 60            | A     | (repetitive or non-repetitive, T <sub>J</sub> = 25°C)                                                                 |
| E <sub>AS</sub>                                 | Single Pulse Avalanche Energy                         |      |      | 720           | mJ    | (starting T <sub>J</sub> = 25°C, I <sub>D</sub> = I <sub>AR</sub> , V <sub>DS</sub> = 25 V)                           |
| E <sub>ARR</sub>                                | Repetitive Avalanche Energy                           |      |      | 100           | mJ    | (pulse width limited by T <sub>Jmax</sub> , d < 1%)                                                                   |
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 37            | A     | (repetitive or non-repetitive, T <sub>J</sub> = 100°C)                                                                |
| Electrical Characteristics - OFF                |                                                       |      |      |               |       |                                                                                                                       |
| V <sub>BRSS</sub>                               | Drain-Source Breakdown Voltage                        | 100  |      |               | V     | I <sub>D</sub> = 250 µA, V <sub>GS</sub> = 0                                                                          |
| I <sub>DSS</sub>                                | Zero Gate Voltage Drain Current (V <sub>GS</sub> = 0) |      |      | 250<br>1000   | µA    | V <sub>DS</sub> = Max. Rat.<br>V <sub>DS</sub> = Max. Rat. x 0.8, T <sub>C</sub> = 125°C                              |
| I <sub>GSS</sub>                                | Gate-Body Leakage Current (V <sub>GS</sub> = 0)       |      |      | ±100          | nA    | V <sub>DS</sub> = ±20 V                                                                                               |
| Electrical Characteristics - ON*                |                                                       |      |      |               |       |                                                                                                                       |
| V <sub>GS(th)</sub>                             | Gate Threshold Voltage                                | 2    |      | 4             | V     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 µA                                                           |
| R <sub>DS(on)</sub>                             | Static Drain-Source On Resistance                     |      |      | 0.025<br>0.05 |       | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A<br>T <sub>C</sub> = 100°C                                               |
| I <sub>DD(on)</sub>                             | On State Drain Current                                | 60   |      |               | A     | V <sub>DS</sub> > I <sub>DD(on)</sub> x R <sub>DS(on)max</sub> , V <sub>GS</sub> = 10 V                               |
| Electrical Characteristics - Dynamic            |                                                       |      |      |               |       |                                                                                                                       |
| g <sub>fs</sub>                                 | Forward Transconductance                              | 25   |      |               | S     | V <sub>DS</sub> > I <sub>DD(on)</sub> x R <sub>DS(on)max</sub> , I <sub>D</sub> = 30 A                                |
| C <sub>iss</sub>                                | Input Capacitance                                     |      |      | 4000          | pF    | V <sub>DS</sub> = 25 V                                                                                                |
| C <sub>oss</sub>                                | Output Capacitance                                    |      |      | 1100          | pF    | V <sub>GS</sub> = 0                                                                                                   |
| C <sub>res</sub>                                | Reverse Transfer Capacitance                          |      |      | 250           | pF    | f = 1 MHz                                                                                                             |
| Electrical Characteristics - Switching On       |                                                       |      |      |               |       |                                                                                                                       |
| T <sub>d(on)</sub>                              | Turn-On Time                                          |      |      | 90            | nS    | V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A                                                                         |
| t <sub>r</sub>                                  | Rise Time                                             |      |      | 270           | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| (di/dt) <sub>on</sub>                           | Turn-On Current Slope                                 |      |      | 270           | A/µS  | V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A                                                                         |
| Q <sub>g</sub>                                  | Total Gate Charge                                     |      |      | 120           | nC    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V<br>V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A, V <sub>GS</sub> = 10 V |
| Electrical Characteristics - Switching Off      |                                                       |      |      |               |       |                                                                                                                       |
| T <sub>d(off)</sub>                             | Off Voltage Rise Time                                 |      |      | 200           | nS    | V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A                                                                         |
| t <sub>f</sub>                                  | Fall Time                                             |      |      | 210           | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| t <sub>oss</sub>                                | Cross-Over Time                                       |      |      | 410           | nS    |                                                                                                                       |
| Electrical Characteristics - Source Drain Diode |                                                       |      |      |               |       |                                                                                                                       |
| I <sub>SD</sub>                                 | Source Drain Current                                  |      |      | 60            | A     |                                                                                                                       |
| I <sub>SDM</sub> *                              | Source Drain Current (pulsed)                         |      |      | 240           | A     |                                                                                                                       |
| V <sub>SD</sub>                                 | Forward On Voltage                                    |      |      | 1.6           | V     | I <sub>SD</sub> = 60 A, V <sub>GS</sub> = 0                                                                           |
| t <sub>r</sub>                                  | Reverse Recovery Time                                 |      |      | 180           | nS    | I <sub>SD</sub> = 60 A, di/dt = 100 A/µs                                                                              |
| Q <sub>r</sub>                                  | Reverse Recovery Charge                               |      |      | 1.8           | µC    | V <sub>R</sub> = 80 V                                                                                                 |
| I <sub>RRM</sub>                                | Reverse Recovery Current                              |      |      | 10            | A     |                                                                                                                       |

\*Pulsed: Pulse Duration 300µs, Duty Cycle 1.5%.

# OM55N10SC (T<sub>C</sub> = 25°C unless otherwise specified)

| Avalanche Characteristics                       |                                                       | Min. | Typ. | Max.         | Units | Test Conditions                                                                                                       |
|-------------------------------------------------|-------------------------------------------------------|------|------|--------------|-------|-----------------------------------------------------------------------------------------------------------------------|
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 55           | A     | (repetitive or non-repetitive, T <sub>J</sub> = 25°C)                                                                 |
| E <sub>AS</sub>                                 | Single Pulse Avalanche Energy                         |      |      | 600          | mJ    | (starting T <sub>J</sub> = 25°C, I <sub>D</sub> = I <sub>AR</sub> , V <sub>DS</sub> = 25 V)                           |
| E <sub>ARR</sub>                                | Repetitive Avalanche Energy                           |      |      | 100          | mJ    | (pulse width limited by T <sub>Jmax</sub> , d < 1%)                                                                   |
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 37           | A     | (repetitive or non-repetitive, T <sub>J</sub> = 100°C)                                                                |
| Electrical Characteristics - OFF                |                                                       |      |      |              |       |                                                                                                                       |
| V <sub>BRSS</sub>                               | Drain-Source Breakdown Voltage                        | 100  |      |              | V     | I <sub>D</sub> = 250 µA, V <sub>GS</sub> = 0                                                                          |
| I <sub>DSS</sub>                                | Zero Gate Voltage Drain Current (V <sub>GS</sub> = 0) |      |      | 250<br>1000  | µA    | V <sub>DS</sub> = Max. Rat.<br>V <sub>DS</sub> = Max. Rat. x 0.8, T <sub>C</sub> = 125°C                              |
| I <sub>GSS</sub>                                | Gate-Body Leakage Current (V <sub>GS</sub> = 0)       |      |      | ±100         | nA    | V <sub>DS</sub> = ±20 V                                                                                               |
| Electrical Characteristics - ON*                |                                                       |      |      |              |       |                                                                                                                       |
| V <sub>GS(th)</sub>                             | Gate Threshold Voltage                                | 2    |      | 4            | V     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 µA                                                           |
| R <sub>DS(on)</sub>                             | Static Drain-Source On Resistance                     |      |      | 0.03<br>0.06 |       | V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A<br>T <sub>C</sub> = 100°C                                               |
| I <sub>DD(on)</sub>                             | On State Drain Current                                | 55   |      |              | A     | V <sub>DS</sub> > I <sub>DD(on)</sub> x R <sub>DS(on)max</sub> , V <sub>GS</sub> = 10 V                               |
| Electrical Characteristics - Dynamic            |                                                       |      |      |              |       |                                                                                                                       |
| g <sub>fs</sub>                                 | Forward Transconductance                              | 25   |      |              | S     | V <sub>DS</sub> > I <sub>DD(on)</sub> x R <sub>DS(on)max</sub> , I <sub>D</sub> = 30 A                                |
| C <sub>iss</sub>                                | Input Capacitance                                     |      |      | 4000         | pF    | V <sub>DS</sub> = 25 V                                                                                                |
| C <sub>oss</sub>                                | Output Capacitance                                    |      |      | 1100         | pF    | V <sub>GS</sub> = 0                                                                                                   |
| C <sub>res</sub>                                | Reverse Transfer Capacitance                          |      |      | 250          | pF    | f = 1 MHz                                                                                                             |
| Electrical Characteristics - Switching On       |                                                       |      |      |              |       |                                                                                                                       |
| T <sub>d(on)</sub>                              | Turn-On Time                                          |      |      | 90           | nS    | V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A                                                                         |
| t <sub>r</sub>                                  | Rise Time                                             |      |      | 270          | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| (di/dt) <sub>on</sub>                           | Turn-On Current Slope                                 |      |      | 270          | A/µS  | V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A                                                                         |
| Q <sub>g</sub>                                  | Total Gate Charge                                     |      |      | 120          | nC    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V<br>V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A, V <sub>GS</sub> = 10 V |
| Electrical Characteristics - Switching Off      |                                                       |      |      |              |       |                                                                                                                       |
| T <sub>d(off)</sub>                             | Off Voltage Rise Time                                 |      |      | 200          | nS    | V <sub>DD</sub> = 80 V, I <sub>D</sub> = 30 A                                                                         |
| t <sub>f</sub>                                  | Fall Time                                             |      |      | 210          | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| t <sub>oss</sub>                                | Cross-Over Time                                       |      |      | 410          | nS    |                                                                                                                       |
| Electrical Characteristics - Source Drain Diode |                                                       |      |      |              |       |                                                                                                                       |
| I <sub>SD</sub>                                 | Source Drain Current                                  |      |      | 55           | A     |                                                                                                                       |
| I <sub>SDM</sub> *                              | Source Drain Current (pulsed)                         |      |      | 220          | A     |                                                                                                                       |
| V <sub>SD</sub>                                 | Forward On Voltage                                    |      |      | 1.5          | V     | I <sub>SD</sub> = 55 A, V <sub>GS</sub> = 0                                                                           |
| t <sub>r</sub>                                  | Reverse Recovery Time                                 |      |      | 180          | nS    | I <sub>SD</sub> = 55 A, di/dt = 100 A/µs                                                                              |
| Q <sub>r</sub>                                  | Reverse Recovery Charge                               |      |      | 1.8          | µC    | V <sub>R</sub> = 80 V                                                                                                 |
| I <sub>RRM</sub>                                | Reverse Recovery Current                              |      |      | 11           | A     |                                                                                                                       |

\*Pulsed: Pulse Duration 300µs, Duty Cycle 1.5%.

## OM55N10SA - OM75N06SC

**OM55N10SA** ( $T_C = 25^\circ\text{C}$  unless otherwise specified)

| Avalanche Characteristics                              |                                                  | Min. | Typ. | Max.           | Units            | Test Conditions                                                                |
|--------------------------------------------------------|--------------------------------------------------|------|------|----------------|------------------|--------------------------------------------------------------------------------|
| $I_{AR}$                                               | Avalanche Current                                |      |      | 55             | A                | (repetitive or non-repetitive, $T_J = 25^\circ\text{C}$ )                      |
| $E_{AS}$                                               | Single Pulse Avalanche Energy                    |      |      | 600            | mJ               | (starting $T_J = 25^\circ\text{C}$ , $I_b = I_{AR}$ , $V_{GS} = 25\text{ V}$ ) |
| $E_{AR}$                                               | Repetitive Avalanche Energy                      |      |      | 100            | mJ               | (pulse width limited by $T_{limax}$ , $d < 1\%$ )                              |
| $I_{AR}$                                               | Avalanche Current                                |      |      | 37             | A                | (repetitive or non-repetitive, $T_J = 100^\circ\text{C}$ )                     |
| <b>Electrical Characteristics - OFF</b>                |                                                  |      |      |                |                  |                                                                                |
| $V_{(BR)SS}$                                           | Drain-Source Breakdown Voltage                   | 100  |      |                | V                | $I_b = 250\text{ }\mu\text{A}$ , $V_{GS} = 0$                                  |
| $I_{DSS}$                                              | Zero Gate Voltage Drain Current ( $V_{GS} = 0$ ) |      |      | 250<br>1000    | $\mu\text{A}$    | $V_{DS} = \text{Max. Rat.}$                                                    |
| $I_{GSS}$                                              | Gate-Body Leakage Current ( $V_{DS} = 0$ )       |      |      | $\pm 100$      | nA               | $V_{GS} = \pm 20\text{ V}$                                                     |
| <b>Electrical Characteristics - ON</b>                 |                                                  |      |      |                |                  |                                                                                |
| $V_{GS(th)}$                                           | Gate Threshold Voltage                           | 2    |      | 4              | V                | $V_{DS} = V_{GS}$ , $I_b = 250\text{ }\mu\text{A}$                             |
| $R_{DS(on)}$                                           | Static Drain-Source On Resistance                |      |      | 0.035<br>0.070 |                  | $V_{GS} = 10\text{ V}$ , $I_b = 30\text{ A}$                                   |
| $I_{D(on)}$                                            | On State Drain Current                           | 55   |      |                | A                | $V_{GS} > I_{D(on)} \times R_{DS(on)max}$ , $V_{GS} = 10\text{ V}$             |
| <b>Electrical Characteristics - Dynamic</b>            |                                                  |      |      |                |                  |                                                                                |
| $g_{fs}$                                               | Forward Transconductance                         | 25   |      |                | S                | $V_{GS} > I_{D(on)} \times R_{DS(on)max}$ , $I_b = 30\text{ A}$                |
| $C_{ies}$                                              | Input Capacitance                                |      | 4000 |                | pF               | $V_{DS} = 25\text{ V}$                                                         |
| $C_{oss}$                                              | Output Capacitance                               |      | 1100 |                | pF               | $V_{GS} = 0$                                                                   |
| $C_{res}$                                              | Reverse Transfer Capacitance                     |      | 250  |                | pF               | $f = 1\text{ MHz}$                                                             |
| <b>Electrical Characteristics - Switching On</b>       |                                                  |      |      |                |                  |                                                                                |
| $T_{d(on)}$                                            | Turn-On Time                                     |      | 90   |                | nS               | $V_{DD} = 80\text{ V}$ , $I_b = 30\text{ A}$                                   |
| $t_r$                                                  | Rise Time                                        |      | 270  |                | nS               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                            |
| $(di/dt)_{on}$                                         | Turn-On Current Slope                            |      | 270  |                | A/ $\mu\text{s}$ | $V_{DD} = 80\text{ V}$ , $I_b = 30\text{ A}$                                   |
| $Q_{di}$                                               | Total Gate Charge                                |      | 120  |                | nC               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                            |
| <b>Electrical Characteristics - Switching Off</b>      |                                                  |      |      |                |                  |                                                                                |
| $T_{d(off)}$                                           | Off Voltage Rise Time                            |      | 200  |                | nS               | $V_{DD} = 80\text{ V}$ , $I_b = 30\text{ A}$                                   |
| $t_f$                                                  | Fall Time                                        |      | 210  |                | nS               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                            |
| $t_{cross}$                                            | Cross-Over Time                                  |      | 410  |                | nS               |                                                                                |
| <b>Electrical Characteristics - Source Drain Diode</b> |                                                  |      |      |                |                  |                                                                                |
| $I_{SD}$                                               | Source Drain Current                             |      |      | 55             | A                |                                                                                |
| $I_{SDM}^*$                                            | Source Drain Current (pulsed)                    |      |      | 180            | A                |                                                                                |
| $V_{SD}$                                               | Forward On Voltage                               |      |      | 1.5            | V                | $I_{SD} = 55\text{ A}$ , $V_{GS} = 0$                                          |
| $t_{rr}$                                               | Reverse Recovery Time                            |      | 180  |                | nS               | $I_{SD} = 55\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$                    |
| $Q_{rr}$                                               | Reverse Recovery Charge                          |      | 1.8  |                | $\mu\text{C}$    | $V_R = 80\text{ V}$                                                            |
| $I_{RRM}$                                              | Reverse Recovery Current                         |      | 11   |                | A                |                                                                                |

\*Pulsed: Pulse Duration 300 $\mu\text{s}$ , Duty Cycle 1.5%.**OM75N06SC** ( $T_C = 25^\circ\text{C}$  unless otherwise specified)

| Avalanche Characteristics                              |                                                  | Min. | Typ. | Max.           | Units            | Test Conditions                                                                |
|--------------------------------------------------------|--------------------------------------------------|------|------|----------------|------------------|--------------------------------------------------------------------------------|
| $I_{AR}$                                               | Avalanche Current                                |      |      | 70             | A                | (repetitive or non-repetitive, $T_J = 25^\circ\text{C}$ )                      |
| $E_{AS}$                                               | Single Pulse Avalanche Energy                    |      |      | 900            | mJ               | (starting $T_J = 25^\circ\text{C}$ , $I_b = I_{AR}$ , $V_{GS} = 25\text{ V}$ ) |
| $E_{AR}$                                               | Repetitive Avalanche Energy                      |      |      | 200            | mJ               | (pulse width limited by $T_{limax}$ , $d < 1\%$ )                              |
| $I_{AR}$                                               | Avalanche Current                                |      |      | 40             | A                | (repetitive or non-repetitive, $T_J = 100^\circ\text{C}$ )                     |
| <b>Electrical Characteristics - OFF</b>                |                                                  |      |      |                |                  |                                                                                |
| $V_{(BR)SS}$                                           | Drain-Source Breakdown Voltage                   | 60   |      |                | V                | $I_b = 250\text{ }\mu\text{A}$ , $V_{GS} = 0$                                  |
| $I_{DSS}$                                              | Zero Gate Voltage Drain Current ( $V_{GS} = 0$ ) |      |      | 250<br>1000    | $\mu\text{A}$    | $V_{DS} = \text{Max. Rat.}$                                                    |
| $I_{GSS}$                                              | Gate-Body Leakage Current ( $V_{DS} = 0$ )       |      |      | $\pm 100$      | nA               | $V_{GS} = \pm 20\text{ V}$                                                     |
| <b>Electrical Characteristics - ON</b>                 |                                                  |      |      |                |                  |                                                                                |
| $V_{GS(th)}$                                           | Gate Threshold Voltage                           | 2    |      | 4              | V                | $V_{DS} = V_{GS}$ , $I_b = 250\text{ }\mu\text{A}$                             |
| $R_{DS(on)}$                                           | Static Drain-Source On Resistance                |      |      | 0.016<br>0.032 |                  | $V_{GS} = 10\text{ V}$ , $I_b = 40\text{ A}$                                   |
| $I_{D(on)}$                                            | On State Drain Current                           | 75   |      |                | A                | $V_{GS} > I_{D(on)} \times R_{DS(on)max}$ , $V_{GS} = 10\text{ V}$             |
| <b>Electrical Characteristics - Dynamic</b>            |                                                  |      |      |                |                  |                                                                                |
| $g_{fs}$                                               | Forward Transconductance                         | 25   |      |                | S                | $V_{GS} > I_{D(on)} \times R_{DS(on)max}$ , $I_b = 40\text{ A}$                |
| $C_{ies}$                                              | Input Capacitance                                |      | 4100 |                | pF               | $V_{DS} = 25\text{ V}$                                                         |
| $C_{oss}$                                              | Output Capacitance                               |      | 1800 |                | pF               | $V_{GS} = 0$                                                                   |
| $C_{res}$                                              | Reverse Transfer Capacitance                     |      | 420  |                | pF               | $f = 1\text{ MHz}$                                                             |
| <b>Electrical Characteristics - Switching On</b>       |                                                  |      |      |                |                  |                                                                                |
| $T_{d(on)}$                                            | Turn-On Time                                     |      | 190  |                | nS               | $V_{DD} = 25\text{ V}$ , $I_b = 40\text{ A}$                                   |
| $t_r$                                                  | Rise Time                                        |      | 900  |                | nS               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                            |
| $(di/dt)_{on}$                                         | Turn-On Current Slope                            |      | 150  |                | A/ $\mu\text{s}$ | $V_{DD} = 25\text{ V}$ , $I_b = 40\text{ A}$                                   |
| $Q_{di}$                                               | Total Gate Charge                                |      | 130  |                | nC               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                            |
| <b>Electrical Characteristics - Switching Off</b>      |                                                  |      |      |                |                  |                                                                                |
| $T_{d(off)}$                                           | Off Voltage Rise Time                            |      | 360  |                | nS               | $V_{DD} = 40\text{ V}$ , $I_b = 75\text{ A}$                                   |
| $t_f$                                                  | Fall Time                                        |      | 280  |                | nS               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                            |
| $t_{cross}$                                            | Cross-Over Time                                  |      | 600  |                | nS               |                                                                                |
| <b>Electrical Characteristics - Source Drain Diode</b> |                                                  |      |      |                |                  |                                                                                |
| $I_{SD}$                                               | Source Drain Current                             |      |      | 75             | A                |                                                                                |
| $I_{SDM}^*$                                            | Source Drain Current (pulsed)                    |      |      | 300            | A                |                                                                                |
| $V_{SD}$                                               | Forward On Voltage                               |      |      | 1.5            | V                | $I_{SD} = 75\text{ A}$ , $V_{GS} = 0$                                          |
| $t_{rr}$                                               | Reverse Recovery Time                            |      | 120  |                | nS               | $I_{SD} = 75\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$                    |
| $Q_{rr}$                                               | Reverse Recovery Charge                          |      | 0.45 |                | $\mu\text{C}$    | $V_R = 25\text{ V}$                                                            |
| $I_{RRM}$                                              | Reverse Recovery Current                         |      | 6.5  |                | A                |                                                                                |

\*Pulsed: Pulse Duration 300 $\mu\text{s}$ , Duty Cycle 1.5%.

# OM75N06SA (T<sub>C</sub> = 25°C unless otherwise specified)

| Avalanche Characteristics                       |                                                       | Min. | Typ. | Max.           | Units | Test Conditions                                                                                                       |
|-------------------------------------------------|-------------------------------------------------------|------|------|----------------|-------|-----------------------------------------------------------------------------------------------------------------------|
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 70             | A     | (repetitive or non-repetitive, T <sub>J</sub> = 25°C)                                                                 |
| E <sub>AS</sub>                                 | Single Pulse Avalanche Energy                         |      |      | 900            | mJ    | (starting T <sub>J</sub> = 25°C, I <sub>b</sub> = I <sub>AR</sub> , V <sub>DO</sub> = 25 V)                           |
| E <sub>ARR</sub>                                | Repetitive Avalanche Energy                           |      |      | 200            | mJ    | (pulse width limited by T <sub>Jmax</sub> , d < 1%)                                                                   |
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 40             | A     | (repetitive or non-repetitive, T <sub>J</sub> = 100°C)                                                                |
| Electrical Characteristics - OFF                |                                                       |      |      |                |       |                                                                                                                       |
| V <sub>BR(ESS)</sub>                            | Drain-Source Breakdown Voltage                        | 60   |      |                | V     | I <sub>b</sub> = 250 µA, V <sub>GS</sub> = 0                                                                          |
| I <sub>DSS</sub>                                | Zero Gate Voltage Drain Current (V <sub>GS</sub> = 0) |      |      | 250<br>1000    | µA    | V <sub>DS</sub> = Max. Rat<br>V <sub>DS</sub> = Max. Rat. x 0.8, T <sub>C</sub> = 125°C                               |
| I <sub>GSS</sub>                                | Gate-Body Leakage Current (V <sub>GS</sub> = 0)       |      |      | ±100           | nA    | V <sub>DS</sub> = ±20 V                                                                                               |
| Electrical Characteristics - ON*                |                                                       |      |      |                |       |                                                                                                                       |
| V <sub>GS(th)</sub>                             | Gate Threshold Voltage                                | 2    |      | 4              | V     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>b</sub> = 250 µA                                                           |
| R <sub>DS(on)</sub>                             | Static Drain-Source On Resistance                     |      |      | 0.018<br>0.036 |       | V <sub>GS</sub> = 10 V, I <sub>b</sub> = 40 A<br>T <sub>C</sub> = 100°C                                               |
| I <sub>D(on)</sub>                              | On State Drain Current                                | 75   |      |                | A     | V <sub>DS</sub> > I <sub>D(on)</sub> × R <sub>DS(on)max</sub> , V <sub>GS</sub> = 10 V                                |
| Electrical Characteristics - Dynamic            |                                                       |      |      |                |       |                                                                                                                       |
| g <sub>fs</sub>                                 | Forward Transconductance                              | 25   |      |                | S     | V <sub>DS</sub> > I <sub>D(on)</sub> × R <sub>DS(on)max</sub> , I <sub>b</sub> = 40 A                                 |
| C <sub>iss</sub>                                | Input Capacitance                                     |      | 4100 |                | pF    | V <sub>DS</sub> = 25 V                                                                                                |
| C <sub>oss</sub>                                | Output Capacitance                                    |      | 1800 |                | pF    | V <sub>GS</sub> = 0                                                                                                   |
| C <sub>res</sub>                                | Reverse Transfer Capacitance                          |      | 420  |                | pF    | f = 1 MHz                                                                                                             |
| Electrical Characteristics - Switching On       |                                                       |      |      |                |       |                                                                                                                       |
| T <sub>d(on)</sub>                              | Turn-On Time                                          |      | 190  |                | nS    | V <sub>DO</sub> = 25 V, I <sub>b</sub> = 40 A                                                                         |
| t <sub>r</sub>                                  | Rise Time                                             |      | 900  |                | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| (di/dt) <sub>on</sub>                           | Turn-On Current Slope                                 |      | 150  |                | A/µS  | V <sub>DO</sub> = 25 V, I <sub>b</sub> = 40 A                                                                         |
| Q <sub>g1</sub>                                 | Total Gate Charge                                     |      | 130  |                | nC    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V<br>V <sub>DO</sub> = 25 V, I <sub>b</sub> = 40 A, V <sub>GS</sub> = 10 V |
| Electrical Characteristics - Switching Off      |                                                       |      |      |                |       |                                                                                                                       |
| T <sub>d(off)</sub>                             | Off Voltage Rise Time                                 |      | 360  |                | nS    | V <sub>DO</sub> = 40 V, I <sub>b</sub> = 75 A                                                                         |
| t <sub>f</sub>                                  | Fall Time                                             |      | 280  |                | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| t <sub>cross</sub>                              | Cross-Over Time                                       |      | 600  |                | nS    |                                                                                                                       |
| Electrical Characteristics - Source Drain Diode |                                                       |      |      |                |       |                                                                                                                       |
| I <sub>SD</sub>                                 | Source Drain Current                                  |      |      | 75             | A     |                                                                                                                       |
| I <sub>SDM</sub> *                              | Source Drain Current (pulsed)                         |      |      | 300            | A     |                                                                                                                       |
| V <sub>SD</sub>                                 | Forward On Voltage                                    |      |      | 1.5            | V     | I <sub>SD</sub> = 75 A, V <sub>GS</sub> = 0                                                                           |
| t <sub>rr</sub>                                 | Reverse Recovery Time                                 |      | 120  |                | nS    | I <sub>SD</sub> = 75 A, di/dt = 100 A/µs<br>V <sub>R</sub> = 25 V                                                     |
| Q <sub>rr</sub>                                 | Reverse Recovery Charge                               |      | 0.45 |                | µC    |                                                                                                                       |
| I <sub>RRM</sub>                                | Reverse Recovery Current                              |      | 6.5  |                | A     |                                                                                                                       |

\*Pulsed: Pulse Duration 300µS, Duty Cycle 1.5%.

3.1

# OM75N05SC (T<sub>C</sub> = 25°C unless otherwise specified)

| Avalanche Characteristics                       |                                                       | Min. | Typ. | Max.           | Units | Test Conditions                                                                                                       |
|-------------------------------------------------|-------------------------------------------------------|------|------|----------------|-------|-----------------------------------------------------------------------------------------------------------------------|
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 70             | A     | (repetitive or non-repetitive, T <sub>J</sub> = 25°C)                                                                 |
| E <sub>AS</sub>                                 | Single Pulse Avalanche Energy                         |      |      | 900            | mJ    | (starting T <sub>J</sub> = 25°C, I <sub>b</sub> = I <sub>AR</sub> , V <sub>DO</sub> = 25 V)                           |
| E <sub>ARR</sub>                                | Repetitive Avalanche Energy                           |      |      | 200            | mJ    | (pulse width limited by T <sub>Jmax</sub> , d < 1%)                                                                   |
| I <sub>AR</sub>                                 | Avalanche Current                                     |      |      | 40             | A     | (repetitive or non-repetitive, T <sub>J</sub> = 100°C)                                                                |
| Electrical Characteristics - OFF                |                                                       |      |      |                |       |                                                                                                                       |
| V <sub>BR(ESS)</sub>                            | Drain-Source Breakdown Voltage                        | 50   |      |                | V     | I <sub>b</sub> = 250 µA, V <sub>GS</sub> = 0                                                                          |
| I <sub>DSS</sub>                                | Zero Gate Voltage Drain Current (V <sub>GS</sub> = 0) |      |      | 250<br>1000    | µA    | V <sub>DS</sub> = Max. Rat<br>V <sub>DS</sub> = Max. Rat. x 0.8, T <sub>C</sub> = 125°C                               |
| I <sub>GSS</sub>                                | Gate-Body Leakage Current (V <sub>GS</sub> = 0)       |      |      | ±100           | nA    | V <sub>DS</sub> = ±20 V                                                                                               |
| Electrical Characteristics - ON*                |                                                       |      |      |                |       |                                                                                                                       |
| V <sub>GS(th)</sub>                             | Gate Threshold Voltage                                | 2    |      | 4              | V     | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>b</sub> = 250 µA                                                           |
| R <sub>DS(on)</sub>                             | Static Drain-Source On Resistance                     |      |      | 0.016<br>0.032 |       | V <sub>GS</sub> = 10 V, I <sub>b</sub> = 40 A<br>T <sub>C</sub> = 100°C                                               |
| I <sub>D(on)</sub>                              | On State Drain Current                                | 75   |      |                | A     | V <sub>DS</sub> > I <sub>D(on)</sub> × R <sub>DS(on)max</sub> , V <sub>GS</sub> = 10 V                                |
| Electrical Characteristics - Dynamic            |                                                       |      |      |                |       |                                                                                                                       |
| g <sub>fs</sub>                                 | Forward Transconductance                              | 25   |      |                | S     | V <sub>DS</sub> > I <sub>D(on)</sub> × R <sub>DS(on)max</sub> , I <sub>b</sub> = 40 A                                 |
| C <sub>iss</sub>                                | Input Capacitance                                     |      | 4100 |                | pF    | V <sub>DS</sub> = 25 V                                                                                                |
| C <sub>oss</sub>                                | Output Capacitance                                    |      | 1800 |                | pF    | V <sub>GS</sub> = 0                                                                                                   |
| C <sub>res</sub>                                | Reverse Transfer Capacitance                          |      | 420  |                | pF    | f = 1 MHz                                                                                                             |
| Electrical Characteristics - Switching On       |                                                       |      |      |                |       |                                                                                                                       |
| T <sub>d(on)</sub>                              | Turn-On Time                                          |      | 190  |                | nS    | V <sub>DO</sub> = 20 V, I <sub>b</sub> = 40 A                                                                         |
| t <sub>r</sub>                                  | Rise Time                                             |      | 900  |                | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| (di/dt) <sub>on</sub>                           | Turn-On Current Slope                                 |      | 150  |                | A/µS  | V <sub>DO</sub> = 20 V, I <sub>b</sub> = 40 A                                                                         |
| Q <sub>g1</sub>                                 | Total Gate Charge                                     |      | 130  |                | nC    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V<br>V <sub>DO</sub> = 20 V, I <sub>b</sub> = 40 A, V <sub>GS</sub> = 10 V |
| Electrical Characteristics - Switching Off      |                                                       |      |      |                |       |                                                                                                                       |
| T <sub>d(off)</sub>                             | Off Voltage Rise Time                                 |      | 360  |                | nS    | V <sub>DO</sub> = 35 V, I <sub>b</sub> = 75 A                                                                         |
| t <sub>f</sub>                                  | Fall Time                                             |      | 280  |                | nS    | R <sub>G</sub> = 50 , V <sub>GS</sub> = 10 V                                                                          |
| t <sub>cross</sub>                              | Cross-Over Time                                       |      | 600  |                | nS    |                                                                                                                       |
| Electrical Characteristics - Source Drain Diode |                                                       |      |      |                |       |                                                                                                                       |
| I <sub>SD</sub>                                 | Source Drain Current                                  |      |      | 75             | A     |                                                                                                                       |
| I <sub>SDM</sub> *                              | Source Drain Current (pulsed)                         |      |      | 300            | A     |                                                                                                                       |
| V <sub>SD</sub>                                 | Forward On Voltage                                    |      |      | 1.5            | V     | I <sub>SD</sub> = 75 A, V <sub>GS</sub> = 0                                                                           |
| t <sub>rr</sub>                                 | Reverse Recovery Time                                 |      | 120  |                | nS    | I <sub>SD</sub> = 75 A, di/dt = 100 A/µs<br>V <sub>R</sub> = 20 V                                                     |
| Q <sub>rr</sub>                                 | Reverse Recovery Charge                               |      | 0.45 |                | µC    |                                                                                                                       |
| I <sub>RRM</sub>                                | Reverse Recovery Current                              |      | 6.5  |                | A     |                                                                                                                       |

\*Pulsed: Pulse Duration 300µS, Duty Cycle 1.5%.

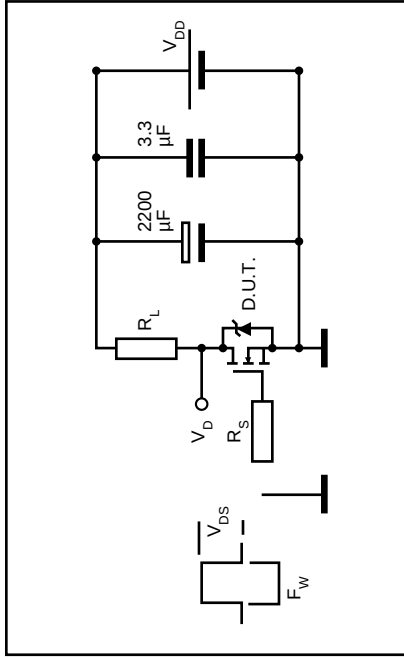
OM55N10SA - OM75N06SC

**OM75N05SA** ( $T_c = 25^\circ\text{C}$  unless otherwise specified)

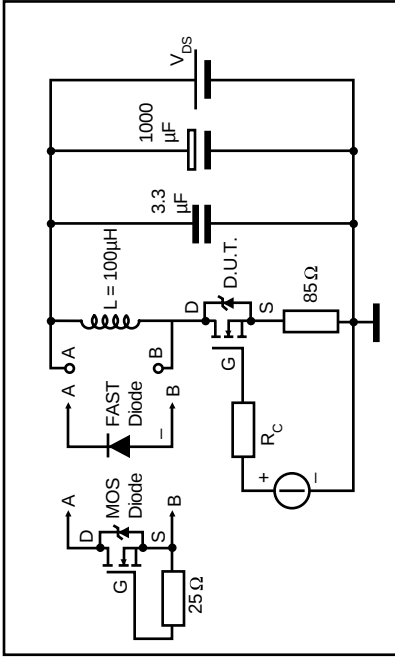
| Avalanche Characteristics                              |                                                  | Min. | Typ. | Max.           | Units            | Test Conditions                                                                                              |
|--------------------------------------------------------|--------------------------------------------------|------|------|----------------|------------------|--------------------------------------------------------------------------------------------------------------|
| $I_{AR}$                                               | Avalanche Current                                |      |      | 70             | A                | (repetitive or non-repetitive, $T_j = 25^\circ\text{C}$ )                                                    |
| $E_{AS}$                                               | Single Pulse Avalanche Energy                    |      |      | 900            | mJ               | (starting $T_j = 25^\circ\text{C}$ , $I_b = I_{AR}$ , $V_{DS} = 25\text{ V}$ )                               |
| $E_{AR}$                                               | Repetitive Avalanche Energy                      |      |      | 200            | mJ               | (pulse width limited by $T_{jmax}$ , $d < 1\%$ )                                                             |
| $I_{AR}$                                               | Avalanche Current                                |      |      | 40             | A                | (repetitive or non-repetitive, $T_j = 100^\circ\text{C}$ )                                                   |
| <b>Electrical Characteristics - OFF</b>                |                                                  |      |      |                |                  |                                                                                                              |
| $V_{DS(ON)}$                                           | Drain-Source Breakdown Voltage                   | 50   |      |                | V                | $I_b = 250\text{ }\mu\text{A}$ , $V_{GS} = 0$                                                                |
| $I_{DSS}$                                              | Zero Gate Voltage Drain Current ( $V_{GS} = 0$ ) |      |      | 250<br>1000    | $\mu\text{A}$    | $V_{DS} = \text{Max. Rat.}$<br>$V_{DS} = \text{Max. Rat.} \times 0.8$ , $T_c = 125^\circ\text{C}$            |
| $I_{DSS}$                                              | Gate-Body Leakage Current ( $V_{GS} = 0$ )       |      |      | $\pm 100$      | nA               | $V_{DS} = \pm 20\text{ V}$                                                                                   |
| <b>Electrical Characteristics - ON</b>                 |                                                  |      |      |                |                  |                                                                                                              |
| $V_{GS(th)}$                                           | Gate Threshold Voltage                           | 2    |      | 4              | V                | $V_{DS} = V_{GS}$ , $I_b = 250\text{ }\mu\text{A}$                                                           |
| $R_{DS(on)}$                                           | Static Drain-Source On Resistance                |      |      | 0.018<br>0.036 |                  | $V_{GS} = 10\text{ V}$ , $I_b = 40\text{ A}$<br>$T_c = 100^\circ\text{C}$                                    |
| $I_{b(on)}$                                            | On State Drain Current                           | 75   |      |                | A                | $V_{DS} > I_{b(on)} \times R_{DS(on)}$ , $V_{GS} = 10\text{ V}$                                              |
| <b>Electrical Characteristics - Dynamic</b>            |                                                  |      |      |                |                  |                                                                                                              |
| $g_{fs}$                                               | Forward Transconductance                         | 25   |      |                | S                | $V_{DS} > I_{b(on)} \times R_{DS(on)}$ , $I_b = 40\text{ A}$                                                 |
| $C_{iss}$                                              | Input Capacitance                                |      | 4100 |                | pF               | $V_{DS} = 25\text{ V}$                                                                                       |
| $C_{oss}$                                              | Output Capacitance                               |      | 1800 |                | pF               | $V_{GS} = 0$                                                                                                 |
| $C_{riss}$                                             | Reverse Transfer Capacitance                     |      | 420  |                | pF               | $f = 1\text{ MHz}$                                                                                           |
| <b>Electrical Characteristics - Switching On</b>       |                                                  |      |      |                |                  |                                                                                                              |
| $T_{d(on)}$                                            | Turn-On Time                                     |      | 190  |                | nS               | $V_{DS} = 20\text{ V}$ , $I_b = 40\text{ A}$                                                                 |
| $t_r$                                                  | Rise Time                                        |      | 900  |                | nS               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                                                          |
| $(di/dt)_{on}$                                         | Turn-On Current Slope                            |      | 150  |                | A/ $\mu\text{S}$ | $V_{DS} = 20\text{ V}$ , $I_b = 40\text{ A}$                                                                 |
| $Q_{on}$                                               | Total Gate Charge                                |      | 130  |                | nC               | $R_G = 50$ , $V_{GS} = 10\text{ V}$<br>$V_{DS} = 20\text{ V}$ , $I_b = 40\text{ A}$ , $V_{GS} = 10\text{ V}$ |
| <b>Electrical Characteristics - Switching Off</b>      |                                                  |      |      |                |                  |                                                                                                              |
| $T_{f(off)}$                                           | Off Voltage Rise Time                            |      | 360  |                | nS               | $V_{DS} = 35\text{ V}$ , $I_b = 75\text{ A}$                                                                 |
| $t_f$                                                  | Fall Time                                        |      | 280  |                | nS               | $R_G = 50$ , $V_{GS} = 10\text{ V}$                                                                          |
| $t_{cross}$                                            | Cross-Over Time                                  |      | 600  |                | nS               |                                                                                                              |
| <b>Electrical Characteristics - Source Drain Diode</b> |                                                  |      |      |                |                  |                                                                                                              |
| $I_{SD}$                                               | Source Drain Current                             |      |      | 75             | A                |                                                                                                              |
| $I_{SDM}^{(*)}$                                        | Source Drain Current (pulsed)                    |      |      | 300            | A                |                                                                                                              |
| $V_{SD}$                                               | Forward On Voltage                               |      |      | 1.5            | V                | $I_{SD} = 75\text{ A}$ , $V_{GS} = 0$                                                                        |
| $t_r$                                                  | Reverse Recovery Time                            |      | 120  |                | nS               | $I_{SD} = 75\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{S}$                                                  |
| $Q_{rr}$                                               | Reverse Recovery Charge                          |      | 0.45 |                | $\mu\text{C}$    | $V_R = 20\text{ V}$                                                                                          |
| $I_{RRM}$                                              | Reverse Recovery Current                         |      | 6.5  |                | A                |                                                                                                              |

\*Pulsed: Pulse Duration 300 $\mu\text{S}$ , Duty Cycle 1.5%.

## SWITCHING TIMES TEST CIRCUITS FOR RESISTIVE LOAD

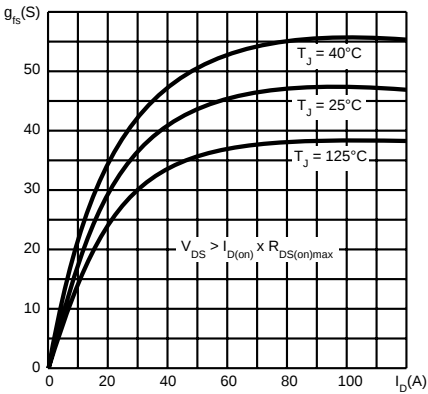


## TEST CIRCUIT FOR INDUCTIVE LOAD SWITCHING AND DIODE REVERSE RECOVERY TIME

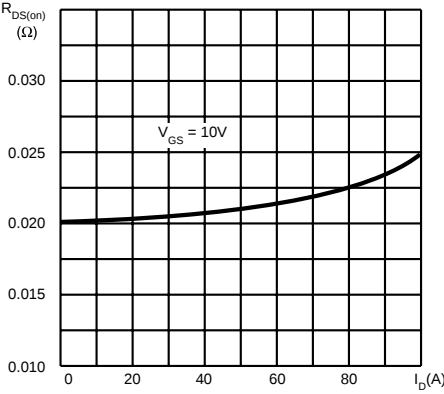


OM75N06SC, OM75N06SA, OM75N05SC, OM75N05SA

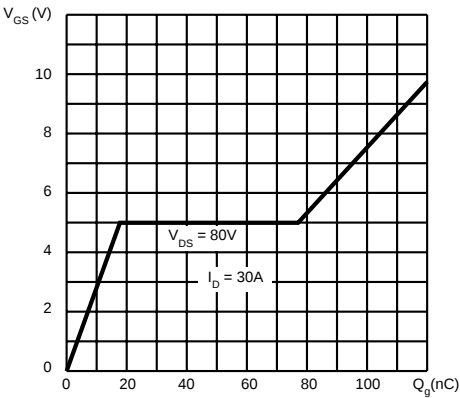
Transconductance



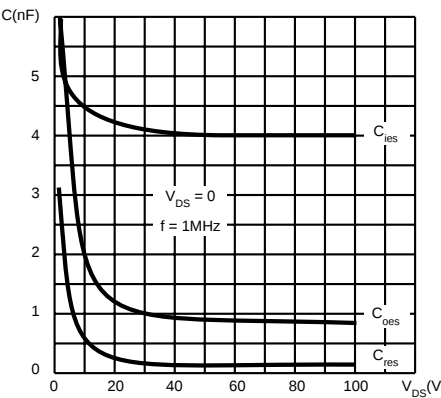
Static Drain-Source On Resistance



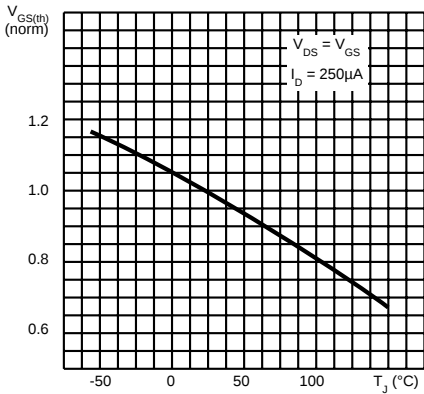
Gate Charge vs Gate-Source Voltage



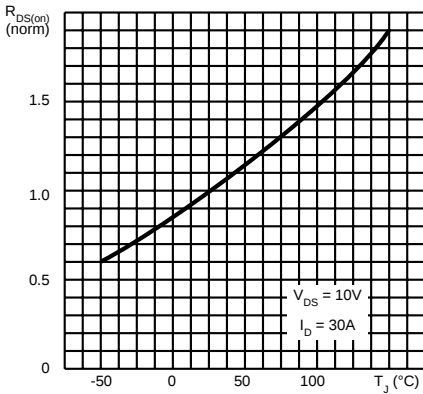
Capacitance Variations



Normalized Gate Threshold Voltage vs Temperature

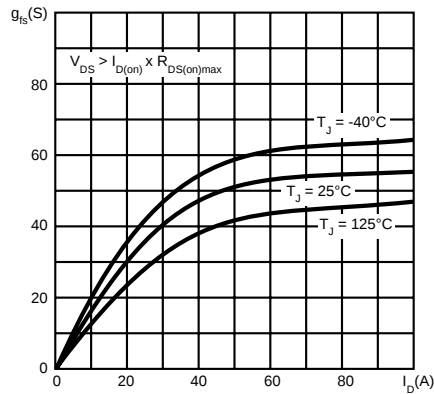


Normalized On Resistance vs Temperature

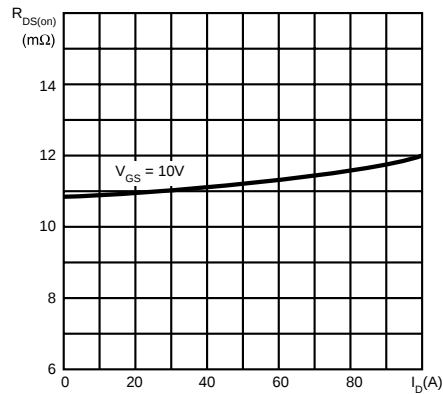


OM75N06SC, OM75N06SA, OM75N05SC, OM75N05SA

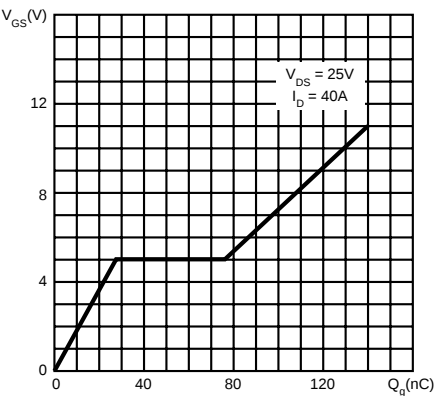
Transconductance



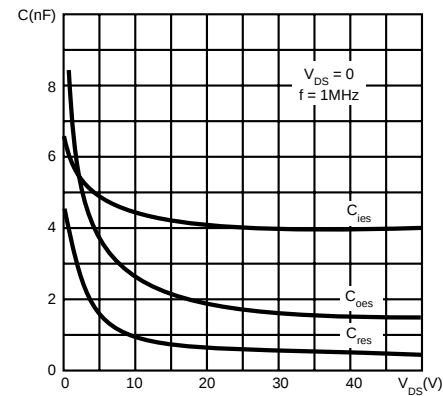
Static Drain-Source On Resistance



Gate Charge vs Gate-Source Voltage

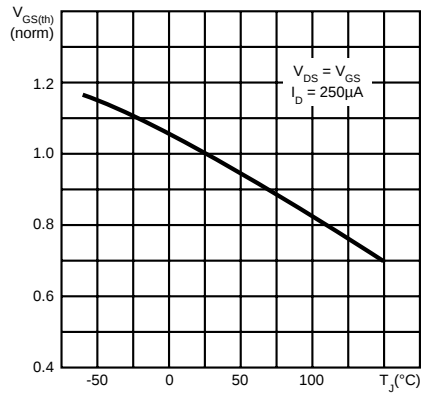


Capacitance Variations



3.1

Normalized Gate Threshold Voltage vs Temperature



Normalized On Resistance vs Temperature

