



# SANYO Semiconductors

## DATA SHEET

# 2SK4116LS — General-Purpose Switching Device Applications

N-Channel Silicon MOSFET

### Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching.
- Adoption of high reliability HVP process.
- Attachment workability is good by Mica-less package.
- Avalanche resistance guarantee.

### Specifications

**Absolute Maximum Ratings** at Ta=25°C

| Parameter                          | Symbol   | Conditions   | Ratings     | Unit |
|------------------------------------|----------|--|-------------|------|
| Drain-to-Source Voltage            | VDSS     |  | 400         | V    |
| Gate-to-Source Voltage             | VGSS     |  | ±30         | V    |
| Drain Current (DC)                 | IDc*1    | Limited only by maximum temperature                | 12          | A    |
|                                    | IDpack*2 | SANYO's ideal heat dissipation condition           | 8.9         | A    |
| Drain Current (Pulse)              | IDP      | PW≤10μs, duty cycle≤1%                             | 38          | A    |
| Allowable Power Dissipation        | PD       |  | 2.0         | W    |
|                                    |          | Tc=25°C (SANYO's ideal heat dissipation condition) | 33          | W    |
| Channel Temperature                | Tch      |  | 150         | °C   |
| Storage Temperature                | Tstg     |  | -55 to +150 | °C   |
| Avalanche Energy (Single Pulse) *3 | EAS      |  | 474         | mJ   |
| Avalanche Current *4               | IAV      |  | 12          | A    |

\*1 Shows chip capability

\*2 Package limited

\*3 VDD=99V, L=5mH, IAV=12A

\*4 L≤5mH, single pulse

Marking : K4116

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## 2SK4116LS

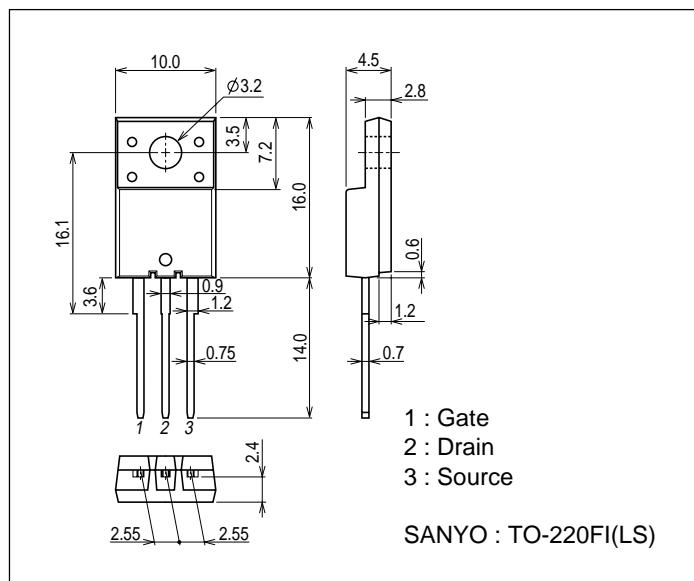
### Electrical Characteristics at $T_a=25^\circ\text{C}$

| Parameter                                  | Symbol                      | Conditions  | Ratings |      |           | Unit          |
|--|-----------------------------|---|---------|------|-----------|---------------|
|  |                             |   | min     | typ  | max       |               |
| Drain-to-Source Breakdown Voltage          | $V_{(\text{BR})\text{DSS}}$ | $I_D=10\text{mA}, V_{GS}=0\text{V}$                     | 400     |      |           | V             |
| Zero-Gate Voltage Drain Current            | $I_{\text{DSS}}$            | $V_{DS}=320\text{V}, V_{GS}=0\text{V}$                  |         |      | 100       | $\mu\text{A}$ |
| Gate-to-Source Leakage Current             | $I_{\text{GSS}}$            | $V_{GS}=\pm 30\text{V}, V_{DS}=0\text{V}$               |         |      | $\pm 100$ | nA            |
| Cutoff Voltage                             | $V_{GS(\text{off})}$        | $V_{DS}=10\text{V}, I_D=1\text{mA}$                     | 3       |      | 5         | V             |
| Forward Transfer Admittance                | $ y_{fs} $                  | $V_{DS}=10\text{V}, I_D=6\text{A}$                      | 2.8     | 5.5  |           | S             |
| Static Drain-to-Source On-State Resistance | $R_{\text{DS(on)}}$         | $I_D=6\text{A}, V_{GS}=10\text{V}$                      |         | 0.41 | 0.54      | $\Omega$      |
| Input Capacitance                          | $C_{\text{iss}}$            | $V_{DS}=30\text{V}, f=1\text{MHz}$                      | 650     |      |           | pF            |
| Output Capacitance                         | $C_{\text{oss}}$            | $V_{DS}=30\text{V}, f=1\text{MHz}$                      | 150     |      |           | pF            |
| Reverse Transfer Capacitance               | $C_{\text{rss}}$            | $V_{DS}=30\text{V}, f=1\text{MHz}$                      | 34      |      |           | pF            |
| Turn-ON Delay Time                         | $t_{\text{d(on)}}$          | See specified Test Circuit.                             |         | 18   |           | ns            |
| Rise Time                                  | $t_r$                       | See specified Test Circuit.                             |         | 65   |           | ns            |
| Turn-OFF Delay Time                        | $t_{\text{d(off)}}$         | See specified Test Circuit.                             |         | 71   |           | ns            |
| Fall Time                                  | $t_f$                       | See specified Test Circuit.                             |         | 36   |           | ns            |
| Total Gate Charge                          | $Q_g$                       | $V_{DS}=200\text{V}, V_{GS}=10\text{V}, I_D=12\text{A}$ | 24.5    |      |           | nC            |
| Gate-to-Source Charge                      | $Q_{\text{gs}}$             | $V_{DS}=200\text{V}, V_{GS}=10\text{V}, I_D=12\text{A}$ | 4.5     |      |           | nC            |
| Gate-to-Drain "Miller" Charge              | $Q_{\text{gd}}$             | $V_{DS}=200\text{V}, V_{GS}=10\text{V}, I_D=12\text{A}$ | 16      |      |           | nC            |
| Diode Forward Voltage                      | $V_{\text{SD}}$             | $I_S=12\text{A}, V_{GS}=0\text{V}$                      |         | 0.94 | 1.2       | V             |

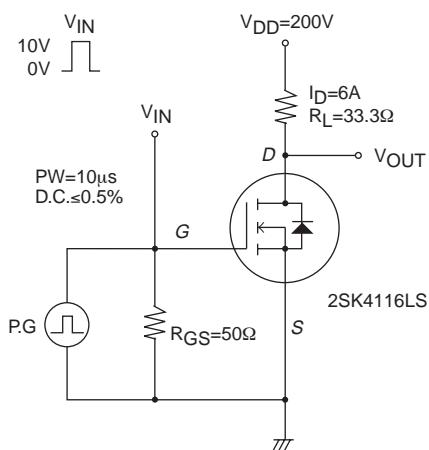
### Package Dimensions

unit : mm (typ)

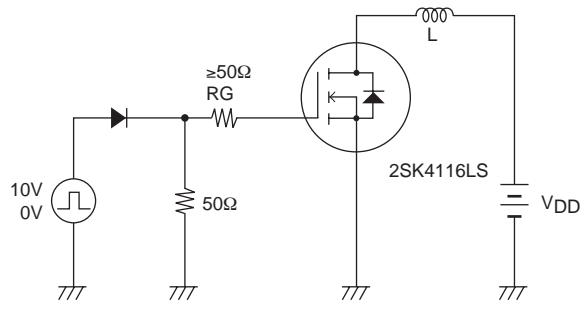
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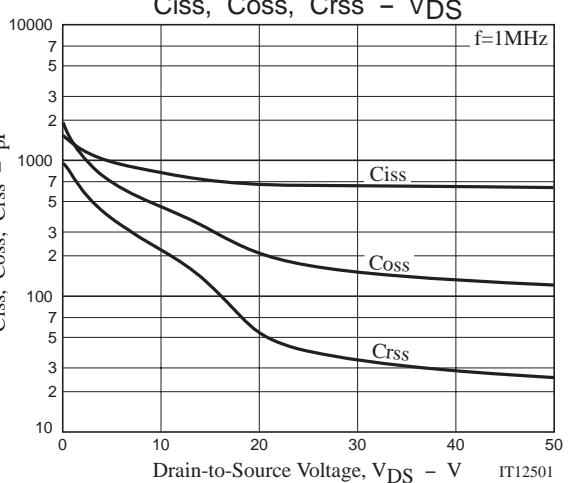
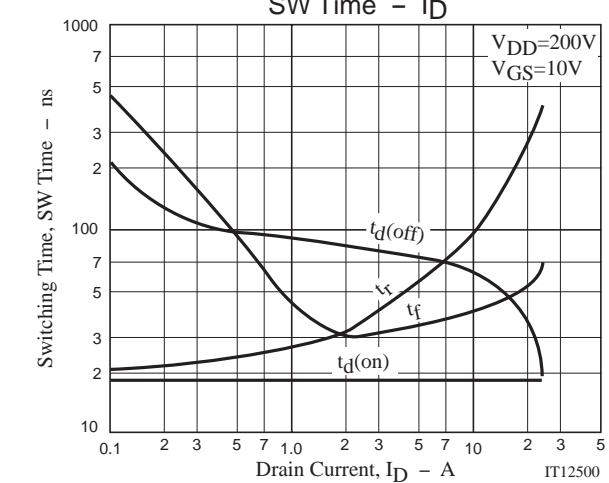
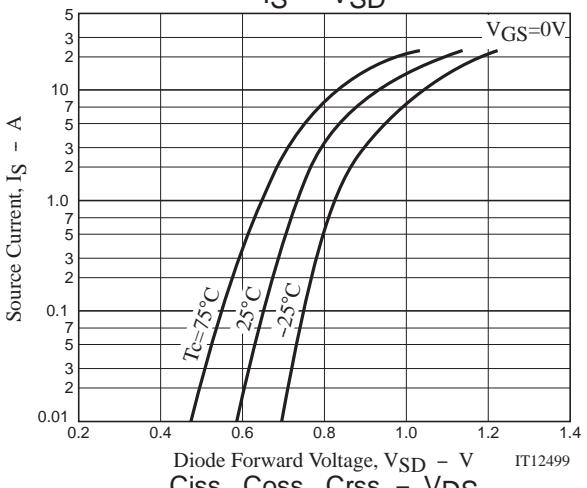
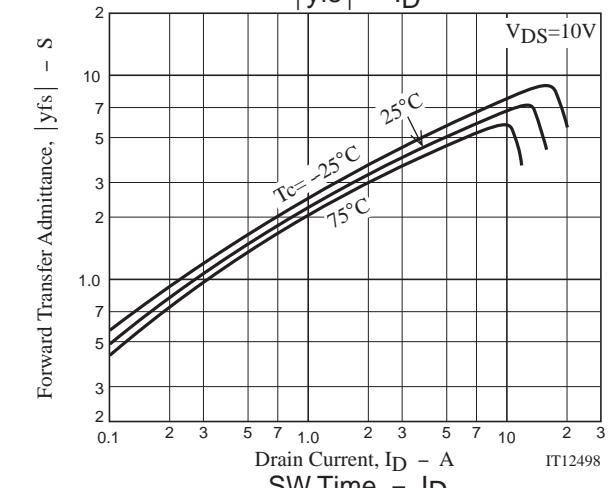
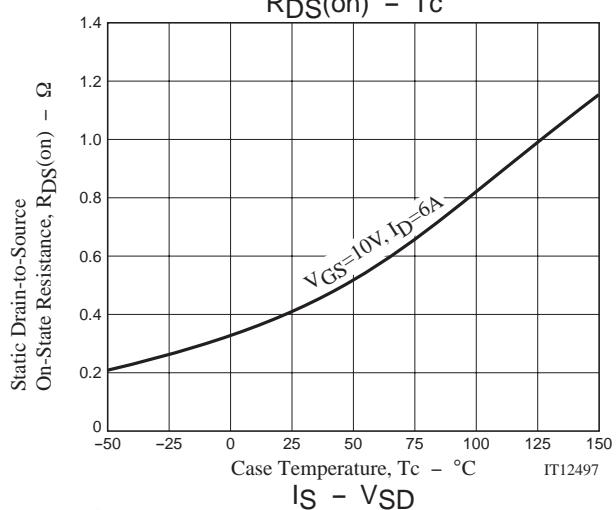
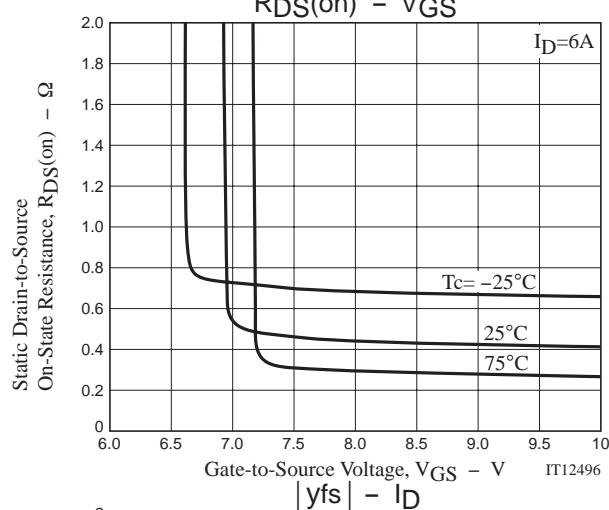
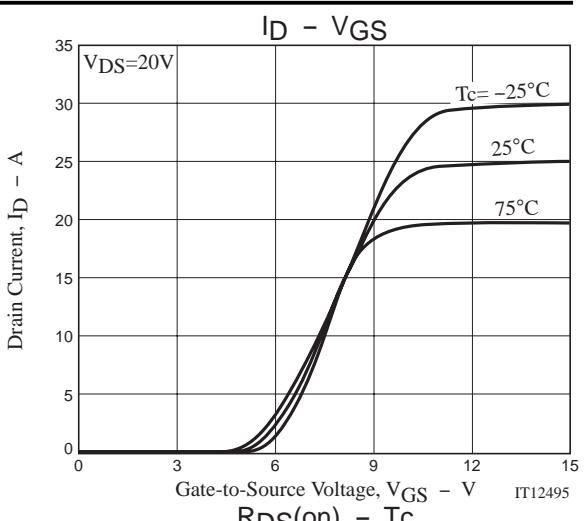
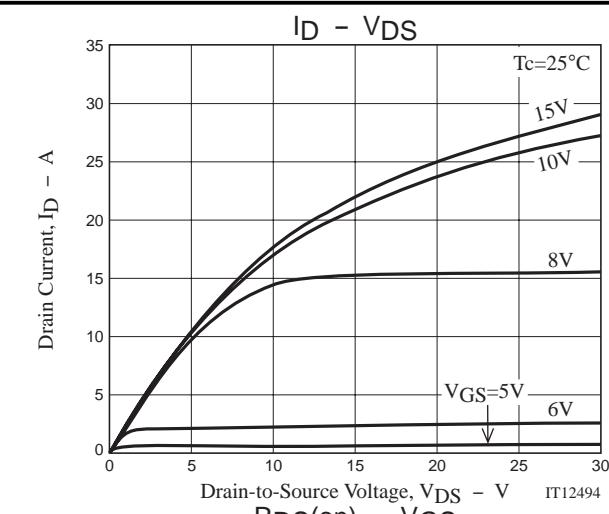
### Switching Time Test Circuit



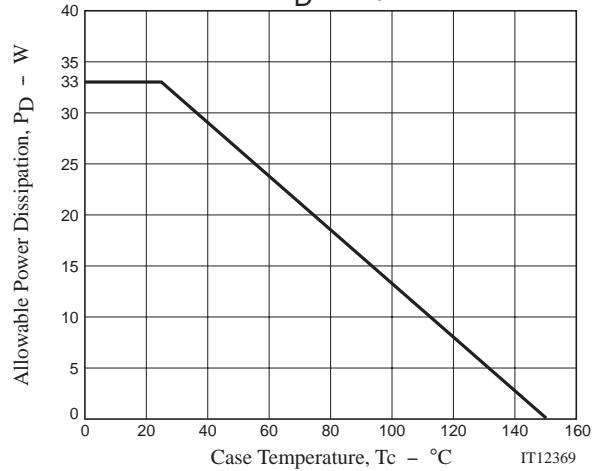
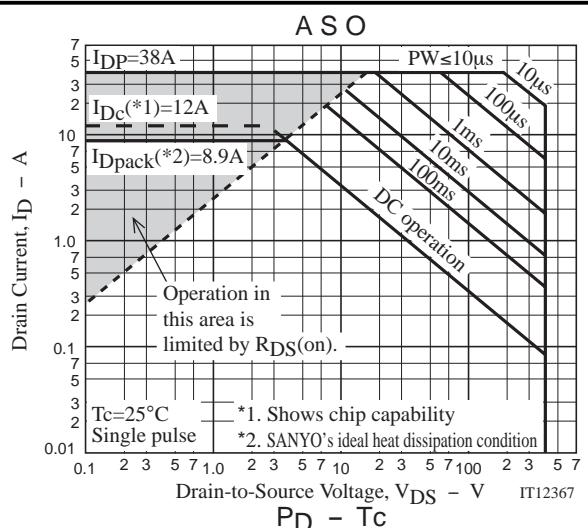
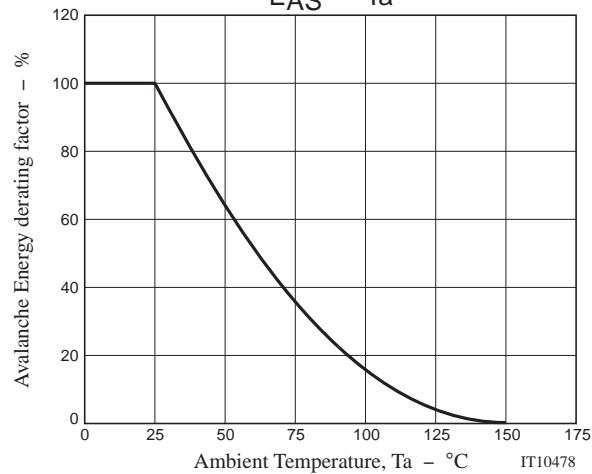
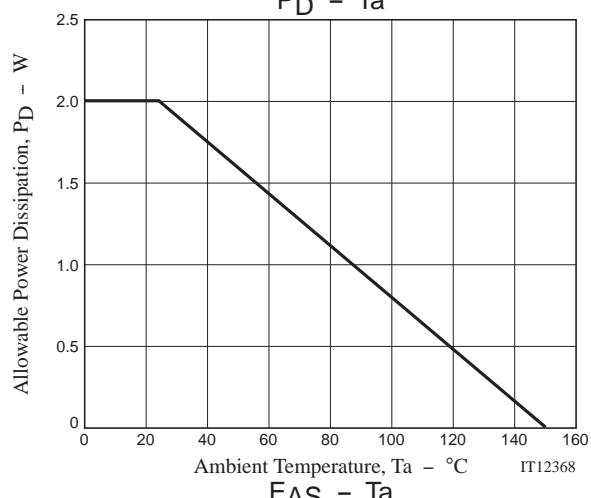
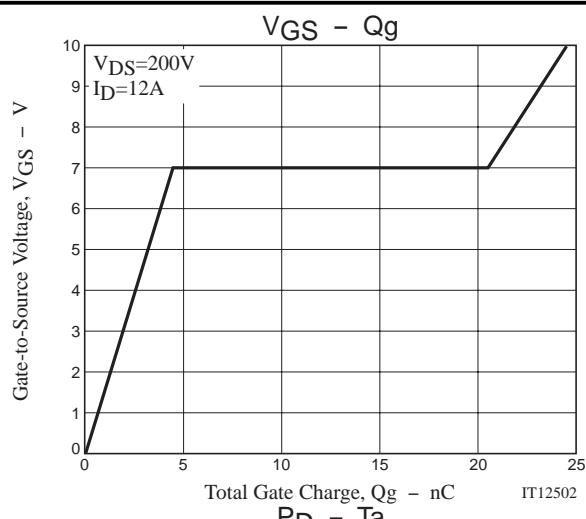
### Avalanche Resistance Test Circuit



## 2SK4116LS



## 2SK4116LS



## 2SK4116LS

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Note on usage : Since the 2SK4116LS is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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