P-Channel 60-V (D-S) MOSFET

TrenchFET® MOSFETs

ESD Protected 2000 V

PRODUCT SUMMARY			
$V_{(BR)DSS(min)}$ (V)	$r_{DS(on)}$ (Ω)	$V_{GS(th)}$ (V)	I_D (mA)
–60	4 @ V_{GS} = –10 V	–1 to –3.0	–190

FEATURES

- High-Side Switching
- Low On-Resistance: 4 Ω
- Low Threshold: –2 V (typ)
- Fast Switching Speed: 20 ns (typ)
- Low Input Capacitance: 20 pF (typ)
- Miniature Package
- Gate-Source ESD Protection

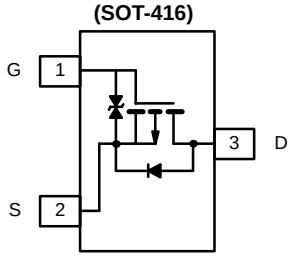
BENEFITS

- Ease in Driving Switches
- Low Offset Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Easily Driven Without Buffer
- Small Board Area

APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Power Supply Converter Circuits
- Solid-State Relays

SC-75A (SOT-416)



Top View

Marking Code: F

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	–60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	–190	mA
	T_A = 85°C		–135	
Pulse Drain Current[b]		I_{DM}	–650	
Power Dissipation[a]	T_A = 25°C	P_D	250	mW
	T_A = 85°C		130	
Maximum Junction-to-Ambient[a]		R_{thJA}	500	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

Notes
a. Surface mounted on FR4 board.
b. Pulse width limited by maximum junction temperature.

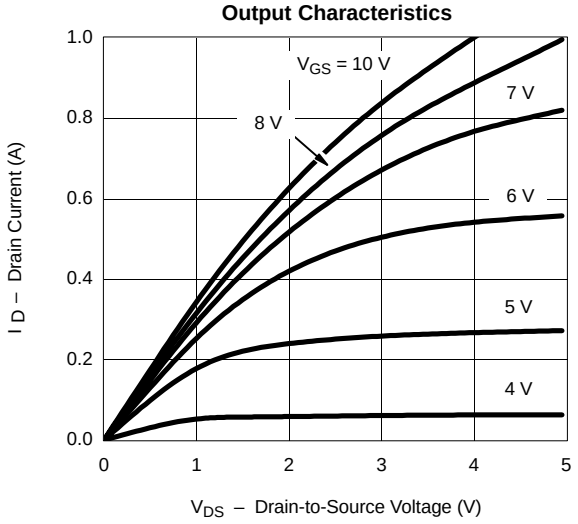
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = –10 µA	–60			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –0.25 mA	–1		–3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±10	µA
		V_{DS} = 0 V, V_{GS} = ±10 V			±200	nA
		V_{DS} = 0 V, V_{GS} = ±10 V, T_J = 85°C			±500	
		V_{DS} = 0 V, V_{GS} = ±5 V			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –50 V, V_{GS} = 0 V			–25	
		V_{DS} = –50 V, V_{GS} = 0 V, T_J = 85°C			–250	
On-State Drain Current[a]	I_D(on)	V_{DS} = –10 V, V_{GS} = –4.5 V	–50			mA
		V_{DS} = –10 V, V_{GS} = –10 V	–600			
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = –4.5 V, I_D = –25 mA			8	Ω
		V_{GS} = –10 V, I_D = –500 mA			4	
		V_{GS} = –10 V, I_D = –500 mA, T_J = 125°C			6	
Forward Transconductance[a]	g_{fs}	V_{DS} = –10 V, I_D = –100 mA	80			mS
Diode Forward Voltage[a]	V_{SD}	I_S = –200 mA, V_{GS} = 0 V			–1.4	V
Dynamic						
Total Gate Charge	Q_g	V_{DS} = –30 V, V_{GS} = –15 V, I_D ≅ –500 mA		1.7		nC
Gate-Source Charge	Q_{gs}			0.26		
Gate-Drain Charge	Q_{gd}			0.46		
Input Capacitance	C_{iss}	V_{DS} = –25 V, V_{GS} = 0 V, f = 1 MHz		23		pF
Output Capacitance	C_{oss}			10		
Reverse Transfer Capacitance	C_{rss}			5		
Switching[b]						
Turn-On Time	t_{ON}	V_{DD} = –25 V, R_L = 150 Ω I_D ≅ –200 mA, V_{GEN} = –10 V R_G = 10 Ω		20		ns
Turn-Off Time	t_{OFF}			35		

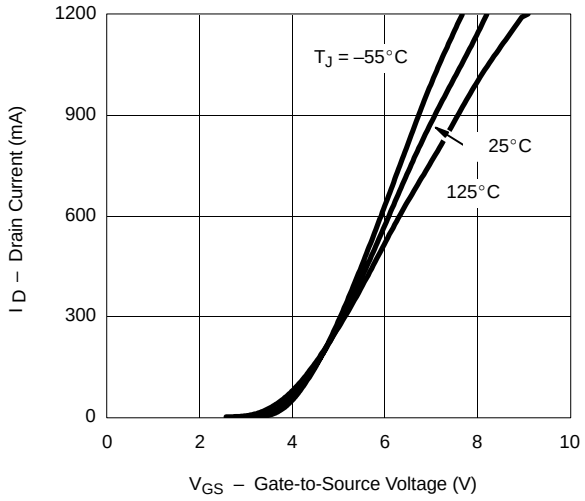
Notes
a. Pulse test: PW ≤ 300 ms duty cycle ≤ 2%.
b. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

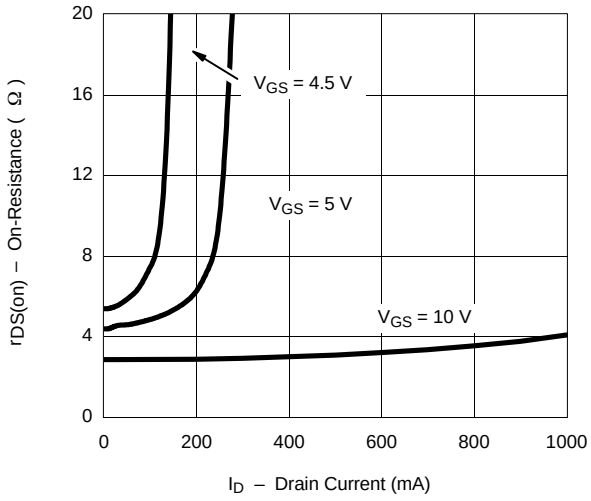
Output Characteristics



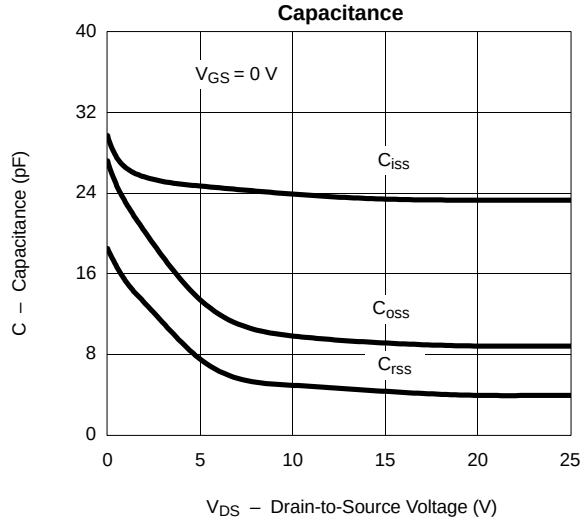
Transfer Characteristics



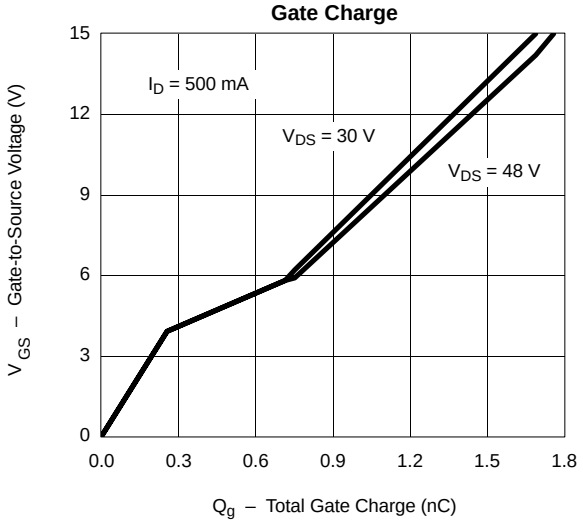
On-Resistance vs. Drain Current



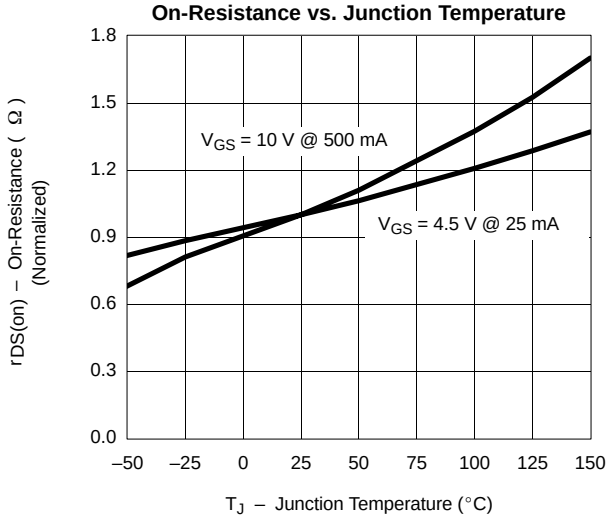
Capacitance



Gate Charge

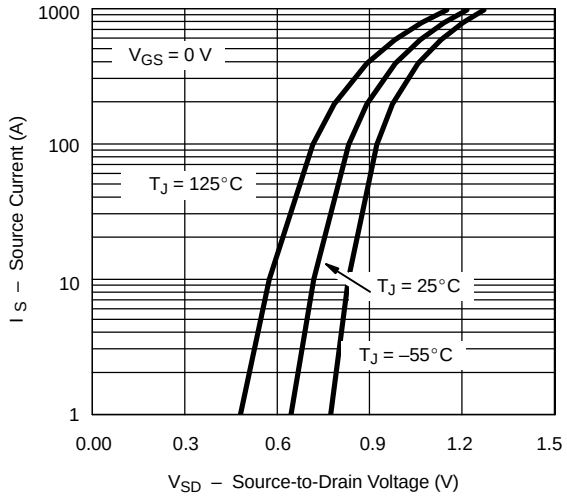


On-Resistance vs. Junction Temperature

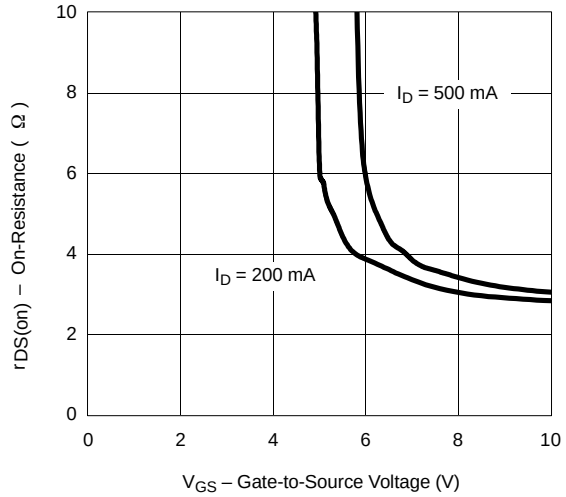


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

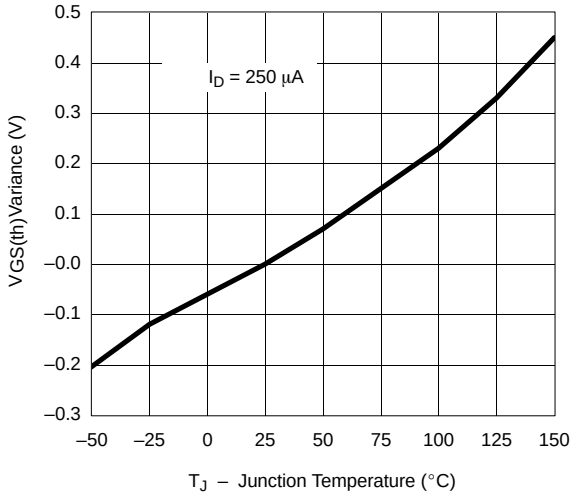
Source-Drain Diode Forward Voltage



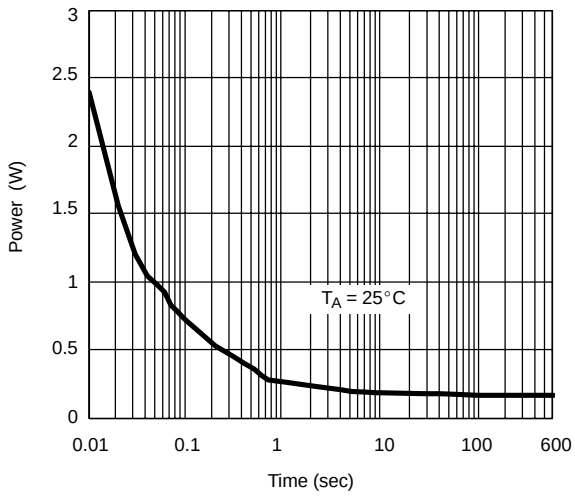
On-Resistance vs. Gate-Source Voltage



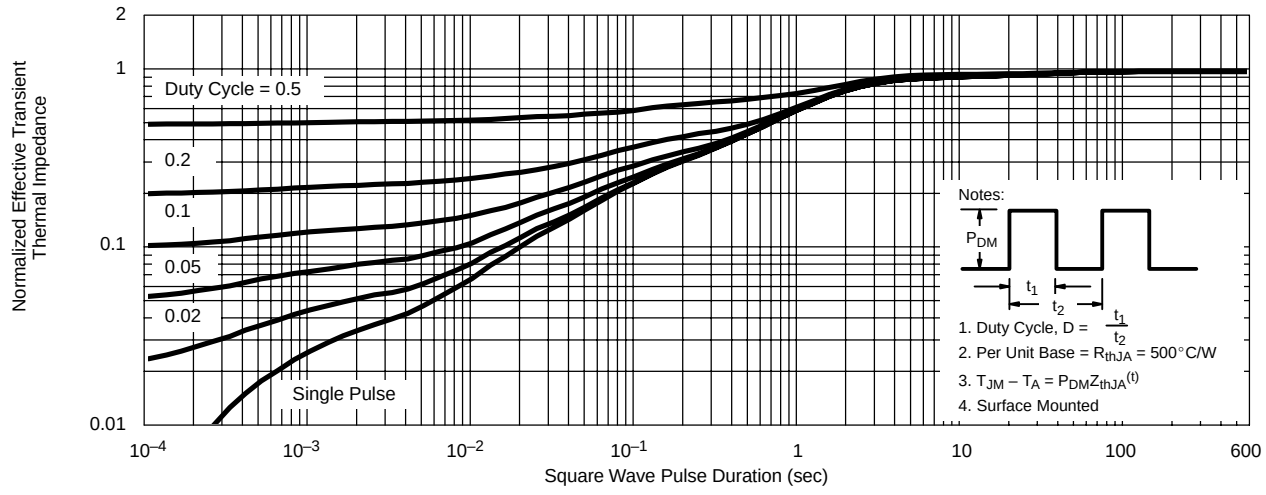
Threshold Voltage Variance Over Temperature



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



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