



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

TrenchFET
MOSFETESD Protected
2000 V

PRODUCT SUMMARY

$V_{(BR)DSS(min)}$ (V)	$r_{DS(on)}$ (Ω)	$V_{GS(th)}$ (V)	I_D (mA)
60	1.25 @ $V_{GS} = 10$ V	1 to 2.5	330

FEATURES

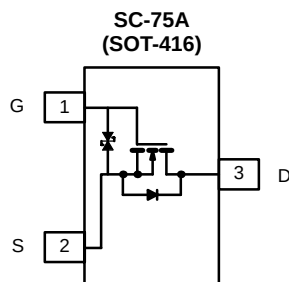
- Low On-Resistance: 1.25 Ω
- Low Threshold: 2.5 V
- Low Input Capacitance: 30 pF
- Fast Switching Speed: 25 ns
- Low Input and Output Leakage
- Miniature Package

BENEFITS

- Low Offset Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Error Voltage
- Small Board Area

APPLICATIONS

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

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^a	I_D	$T_A = 25^\circ\text{C}$ 330	mA
		$T_A = 85^\circ\text{C}$ 240	
Pulsed Drain Current ^a	I_{DM}	650	
Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$ 250	mW
		$T_A = 85^\circ\text{C}$ 130	
Thermal Resistance, Maximum Junction-to-Ambient ^a	R_{thJA}	500	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Notes

c. Surface Mounted on FR4 Board, Power Applied for $t \leq 10$ sec.

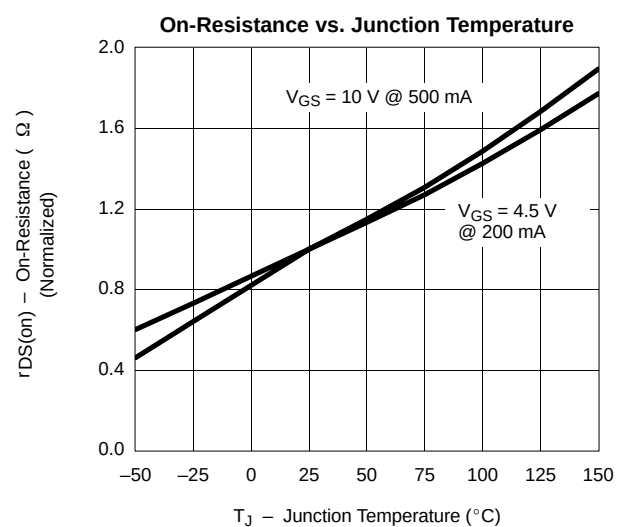
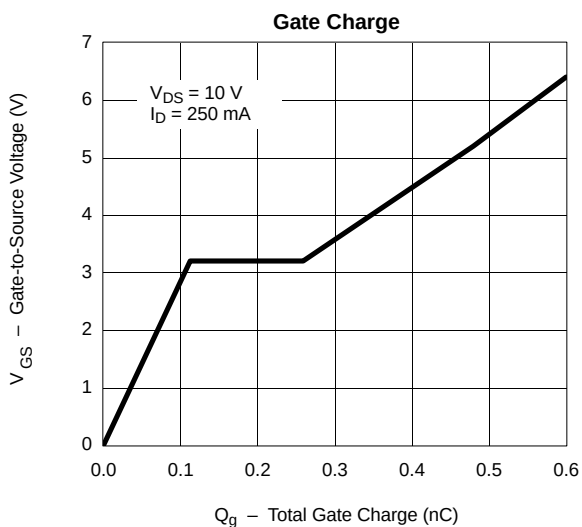
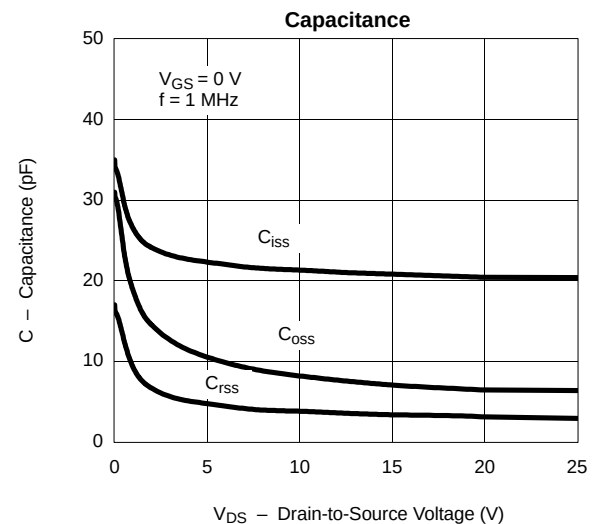
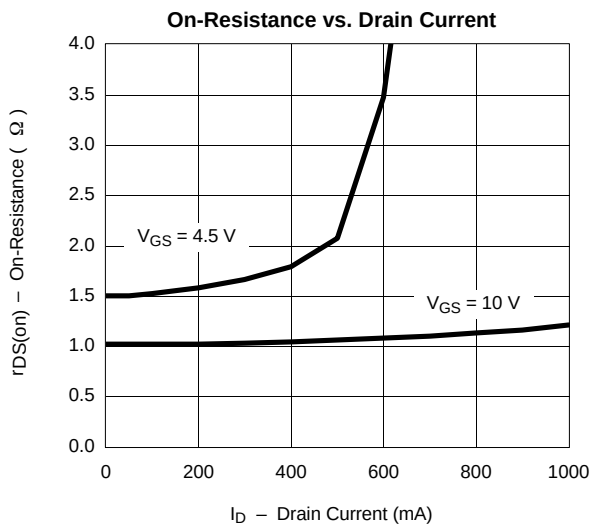
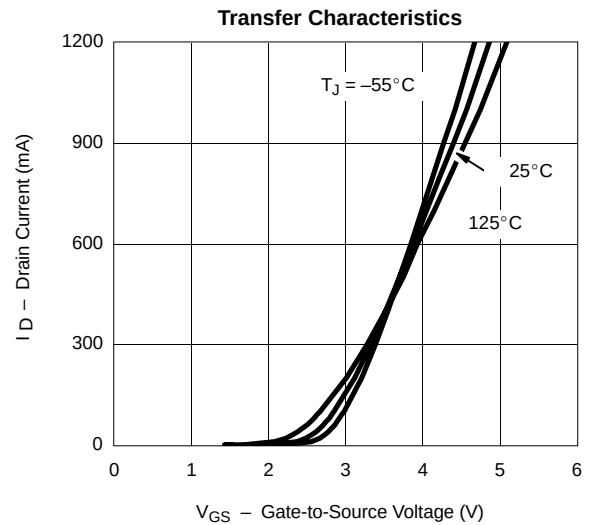
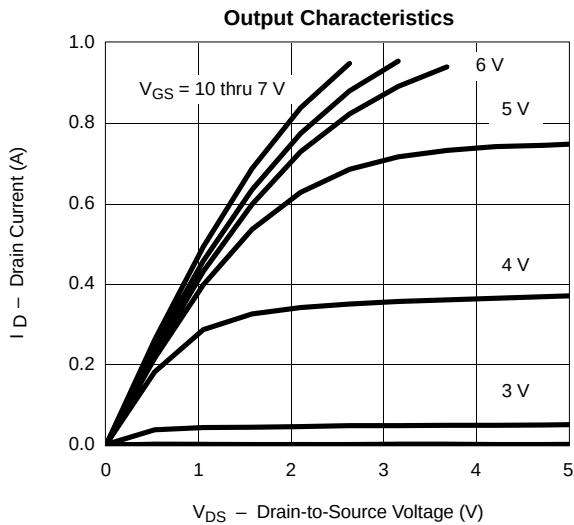
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 10\text{ }\mu\text{A}$	60			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25\text{ mA}$	1		2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{ V}$			± 150	nA
		$T_J = 85^\circ\text{C}$			± 500	
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 5\text{ V}$			± 20	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}$			10	
		$T_J = 85^\circ\text{C}$			100	
			$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$			1
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}$	500			mA
		$V_{DS} = 7.5\text{ V}, V_{GS} = 10\text{ V}$	800			
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 200\text{ mA}$			3.0	Ω
		$T_J = 125^\circ\text{C}$			5.0	
		$V_{GS} = 10\text{ V}, I_D = 500\text{ mA}$			1.25	
		$T_J = 125^\circ\text{C}$			2.25	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 200\text{ mA}$	100			mS
Diode Forward Voltage ^a	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 200\text{ mA}$			1.30	V
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$		30		pF
Output Capacitance	C_{oss}			6		nC
Reverse Transfer Capacitance	C_{rss}			2.5		
Gate Charge	Q_g	$V_{DS} = 10\text{ V}, I_D = 250\text{ mA}$ $V_{GS} = 4.5\text{ V}$			0.6	
Switching ^{b, c}						
Turn-On Time	$t_{(on)}$	$V_{DD} = 30\text{ V}, R_L = 150\text{ }\Omega$ $I_D = 200\text{ mA}, V_{GEN} = 10\text{ V}$ $R_G = 10\text{ }\Omega$			25	ns
Turn-Off Time	$t_{(off)}$				35	

Notes

- a. Pulse test: $PW \leq 300\text{ }\mu\text{s}$ duty cycle $\leq 2\%$.
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

TNJO60

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

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