



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	1.40 @ $V_{GS} = 10$ V	1 to 2.5	500

FEATURES

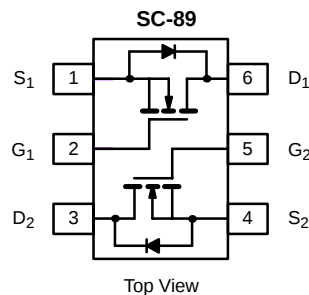
- Low On-Resistance: 1.40 Ω
- Low Threshold: 2 V (typ)
- Low Input Capacitance: 30 pF
- Fast Switching Speed: 15 ns (typ)
- Low Input and Output Leakage
- Miniature Package

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



Marking Code: E

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

Parameter		Symbol	5 secs	Steady State	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	320	305	mA
	T _A = 85°C		230	220	
Pulsed Drain Current ^b		I _{DM}	−650		
Continuous Source Current (diode conduction) ^a		I _S	450	380	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	280	250	mW
	T _A = 85°C		145	130	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	−55 to 150		°C
Gate-Source ESD Rating (HBM, Method 3015)		ESD	2000		V

Notes

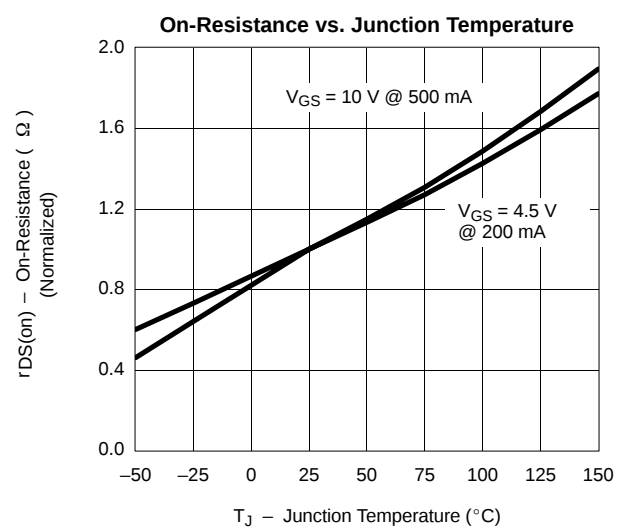
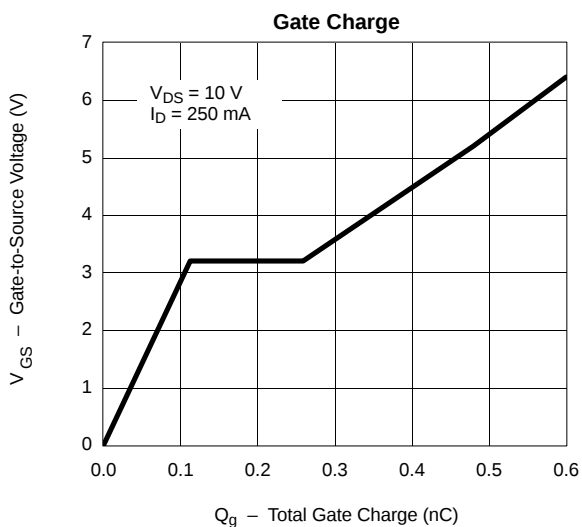
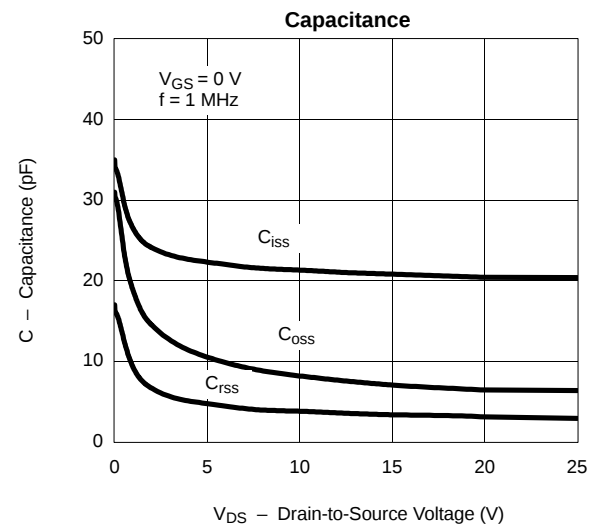
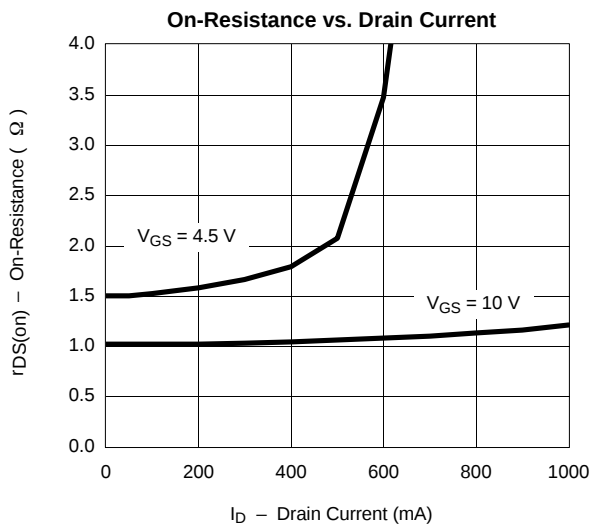
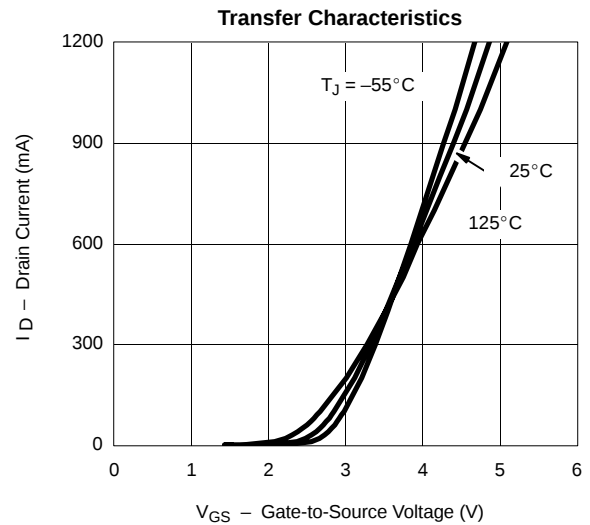
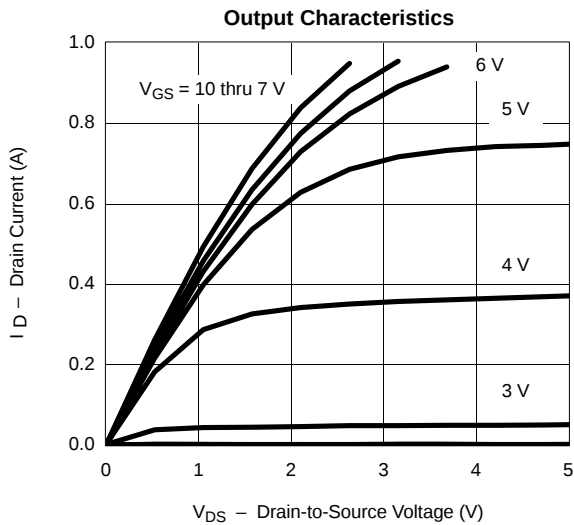
- a. Surface Mounted on FR4 Board.
b. Pulse width limited by maximum junction temperature.

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
		$V_{DS} = 0\text{ V}, V_{GS} = \pm 5\text{ V}$			± 50	
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	
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
		$V_{GS} = 10\text{ V}, I_D = 500\text{ mA}$			1.40	
		$T_J = 125^\circ\text{C}$			2.50	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 200\text{ mA}$		200		mS
Diode Forward Voltage ^a	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 200\text{ mA}$			1.40	V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}, I_D = 250\text{ mA}$ $V_{GS} = 4.5\text{ V}$		600		pC
Gate-Source Charge	Q_{gs}			120		
Gate-Drain Charge	Q_{gd}			225		
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		
Reverse Transfer Capacitance	C_{rss}			3		
Switching ^{b, c}						
Turn-On Time	$t_{(on)}$	$V_{DD} = 30\text{ V}, R_L = 150\text{ }\Omega$ $I_D = 200\text{ mA}, V_{GEN} = 10\text{ V}$ $R_G = 10\text{ }\Omega$		15		ns
Turn-Off Time	$t_{(off)}$			20		

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.

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

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