N-Channel 60-V MOSFET

New Product

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (mA)
60	3 @ V_{GS} = 10 V	250

FEATURES

- Low On-Resistance: 3 Ω
- Low Threshold: 2 V (typ)
- Low Input Capacitance: 25 pF
- Fast Switching Speed: 7.5 ns
- Low Input and Output Leakage

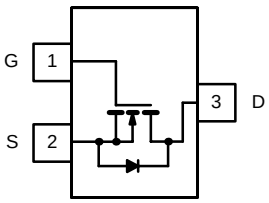
BENEFITS

- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

APPLICATIONS

- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

TO-236
(SOT-23)



Top View

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)	T_A= 25°C	I_D	250	mA
	T_A= 70°C		190	
Pulsed Drain Current[A]		I_{DM}	1300	
Power Dissipation	T_A= 25°C	P_D	0.35	W
	T_A= 70°C		0.22	
Maximum Junction-to-Ambient		R_{thJA}	357	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

Notes
A. Pulse width limited by maximum junction temperature.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70860.

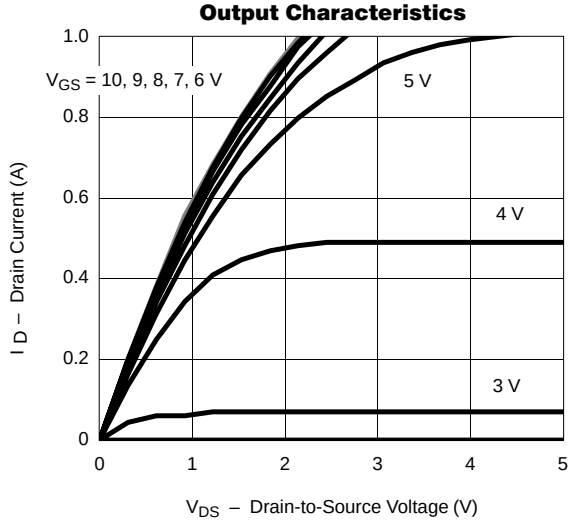
SPECIFICATIONS[A]

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP[B]	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 10 μA	60	70		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1	2	2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±15 V			±10	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	μA
		V_{DS} = 60 V, V_{GS} = 0 V, T_C = 125°C			500	
On-State Drain Current[C]	$I_{D(on)}$	V_{GS} = 10 V, V_{DS} = 7.5 V	800	1300		mA
		V_{GS} = 4.5 V, V_{DS} = 10 V	500	700		
Drain-Source On-Resistance[C]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 250 mA		1.7	3	Ω
		V_{GS} = 4.5 V, I_D = 200 mA		2.5	4	
Forward Transconductance[C]	g_{fs}	V_{DS} = 15 V, I_D = 200 mA		250		mS
Diode Forward Voltage	V_{SD}	I_S = 200 mA, V_{GS} = 0 V		0.85	1.2	V
DYNAMIC[B]						
Total Gate Charge	Q_g	V_{DS} = 30 V, V_{GS} = 10 V I_D ≅ 250 mA		0.4	0.6	nC
Gate-Source Charge	Q_{gs}			0.06		
Gate-Drain Charge	Q_{gd}			0.06		
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz		25		pF
Output Capacitance	C_{oss}			6		
Reverse Transfer Capacitance	C_{rss}			1.2		
SWITCHING[B, D]						
Turn-On Time	$t_{d(on)}$	V_{DD} = 30 V, R_L = 200 Ω I_D ≅ 100 mA, V_{GEN} = 10V R_G = 10 Ω		7.5	20	ns
	t_r			6		
Turn-Off Time	$t_{d(off)}$			7.5	20	
	t_f			3		

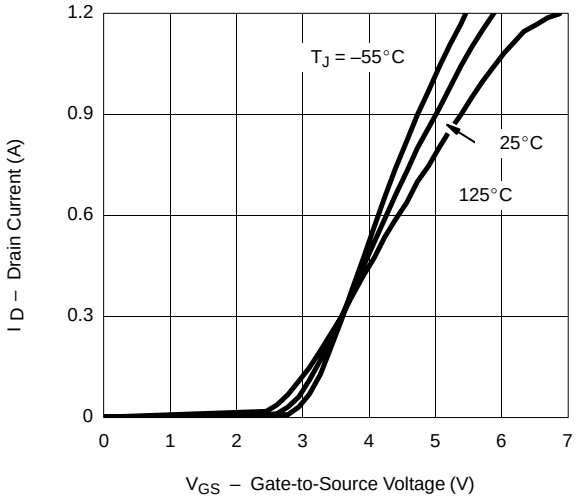
Notes
A. T_A = 25°C unless otherwise noted.
B. For DESIGN AID ONLY, not subject to production testing.
C. Pulse test: PW ≤300 μs duty cycle ≤2%.
D. Switching time is essentially independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS OTHERWISE NOTED)

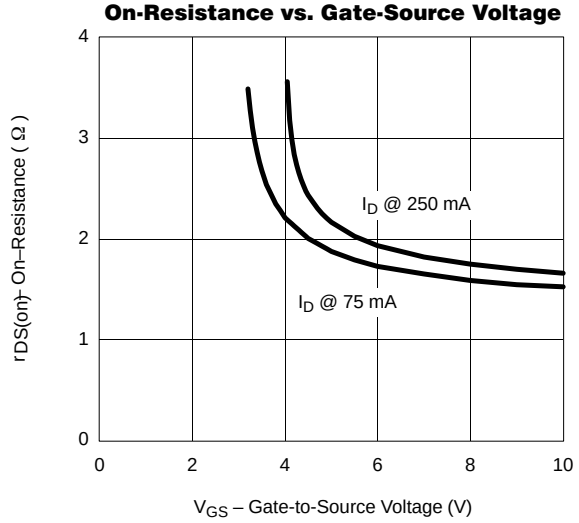
Output Characteristics



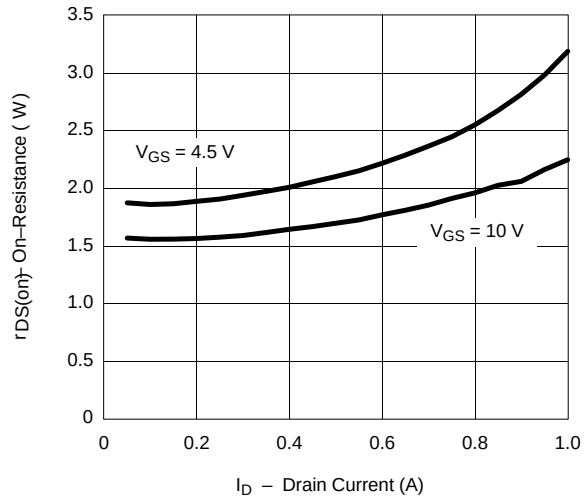
Transfer Characteristics



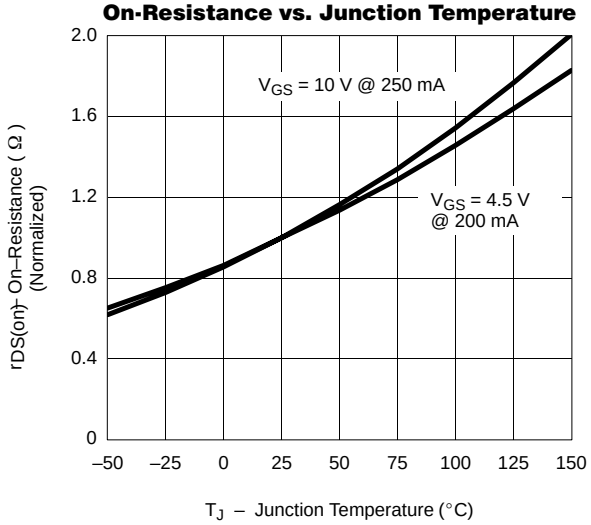
On-Resistance vs. Gate-Source Voltage



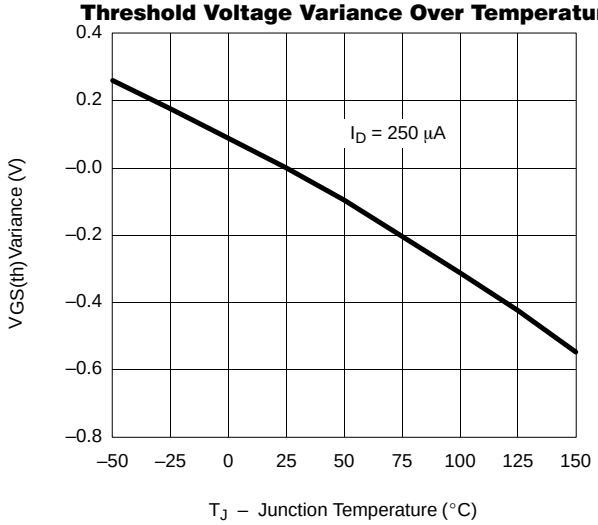
On-Resistance vs. Drain Current



On-Resistance vs. Junction Temperature



Threshold Voltage Variance Over Temperature



TYPICAL CHARACTERISTICS (25°C UNLESS OTHERWISE NOTED)