

Power MOSFET 750 mAmps, 20 Volts N-Channel SOT-23

These miniature surface mount MOSFETs low $R_{DS(on)}$ assure minimal power loss and conserve energy, making these devices ideal for use in space sensitive power management circuitry. Typical applications are dc-dc converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low $R_{DS(on)}$ Provides Higher Efficiency and Extends Battery Life
- Miniature SOT-23 Surface Mount Package Saves Board Space

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	20	Vdc
Gate-to-Source Voltage – Continuous	V_{GS}	± 20	Vdc
Drain Current – Continuous @ $T_A = 25^\circ\text{C}$ – Pulsed Drain Current ($t_p \leq 10 \mu\text{s}$)	I_D I_{DM}	750 2000	mA
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	400	mW
Operating and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	$^\circ\text{C}$
Thermal Resistance – Junction-to-Ambient	$R_{\theta JA}$	300	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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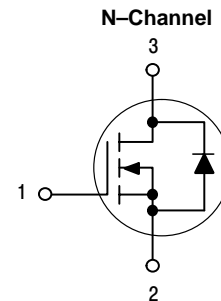
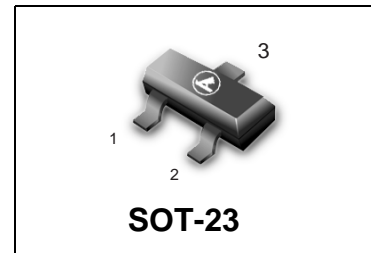
OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage ($V_{GS} = 0 \text{ Vdc}, I_D = 10 \mu\text{Adc}$)	$V_{(BR)DSS}$	20	–	–	Vdc
Zero Gate Voltage Drain Current ($V_{DS} = 20 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}$) ($V_{DS} = 20 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^\circ\text{C}$)	I_{DSS}	–	–	1.0 10	μAdc
Gate-Body Leakage Current ($V_{GS} = \pm 20 \text{ Vdc}, V_{DS} = 0 \text{ Vdc}$)	I_{GSS}	–	–	± 100	nAdc

DEVICE MARKING

LMGSF1N02LT1=N2

LMGSF1N02LT1



LMGSF1N02LT1

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS (Note 1.)

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$)	$V_{GS(th)}$	1.0	1.7	2.4	Vdc
Static Drain-to-Source On-Resistance ($V_{GS} = 10 \text{ Vdc}$, $I_D = 1.2 \text{ Adc}$) ($V_{GS} = 4.5 \text{ Vdc}$, $I_D = 1.0 \text{ Adc}$)	$r_{DS(on)}$	– –	0.075 0.115	0.090 0.130	Ohms

DYNAMIC CHARACTERISTICS

Input Capacitance	($V_{DS} = 5.0 \text{ Vdc}$)	C_{iss}	–	125	–	pF
Output Capacitance	($V_{DS} = 5.0 \text{ Vdc}$)	C_{oss}	–	120	–	
Transfer Capacitance	($V_{DG} = 5.0 \text{ Vdc}$)	C_{rss}	–	45	–	

SWITCHING CHARACTERISTICS (Note 2.)

Turn-On Delay Time	($V_{DD} = 15 \text{ Vdc}$, $I_D = 1.0 \text{ Adc}$, $R_L = 50 \Omega$)	$t_{d(on)}$	–	2.5	–	ns
Rise Time		t_r	–	1.0	–	
Turn-Off Delay Time		$t_{d(off)}$	–	16	–	
Fall Time		t_f	–	8.0	–	
Gate Charge (See Figure 6)		Q_T	–	6000	–	pC

SOURCE-DRAIN DIODE CHARACTERISTICS

Continuous Current	I_S	–	–	0.6	A
Pulsed Current	I_{SM}	–	–	0.75	
Forward Voltage (Note 2.)	V_{SD}	–	0.8	–	V

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2\%$.
2. Switching characteristics are independent of operating junction temperature.

TYPICAL ELECTRICAL CHARACTERISTICS

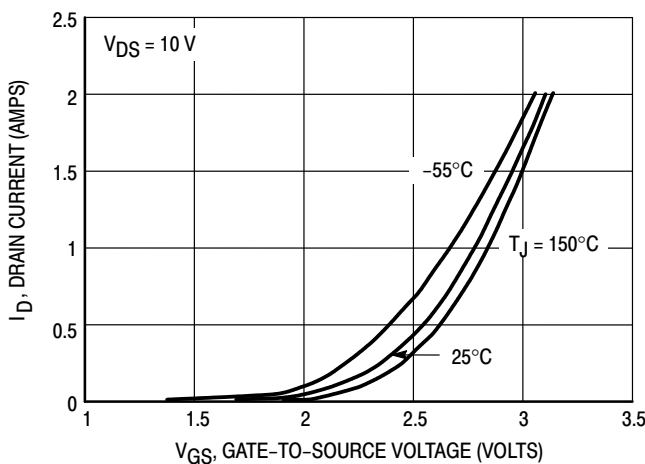


Figure 1. Transfer Characteristics

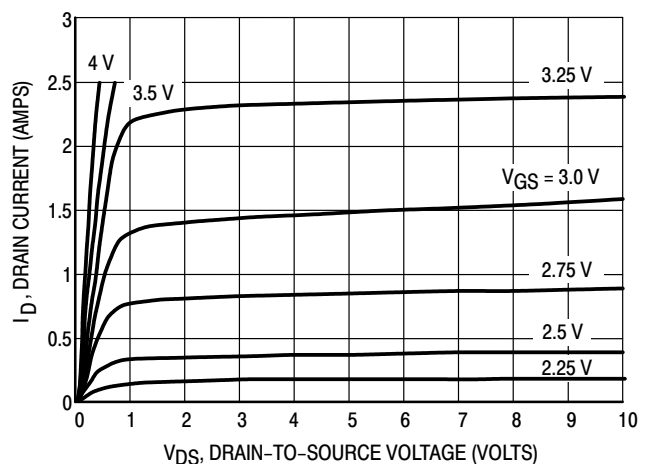


Figure 2. On-Region Characteristics

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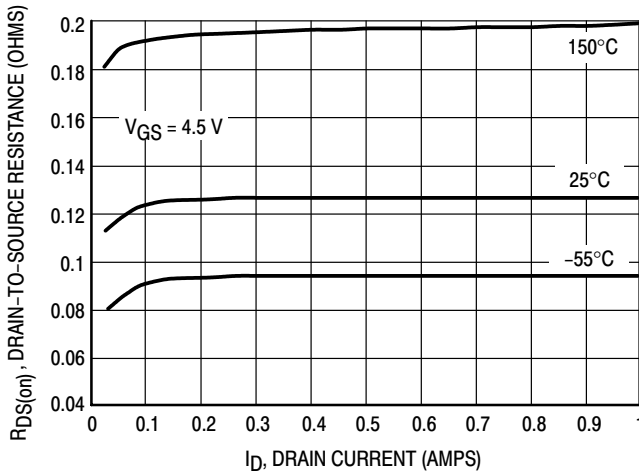


Figure 3. On-Resistance versus Drain Current

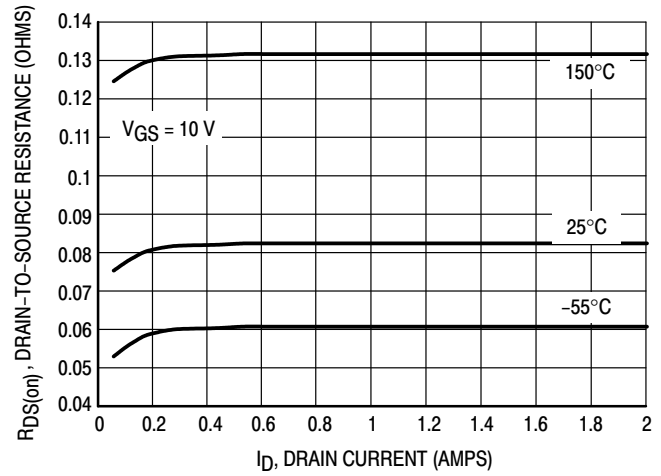


Figure 4. On-Resistance versus Drain Current

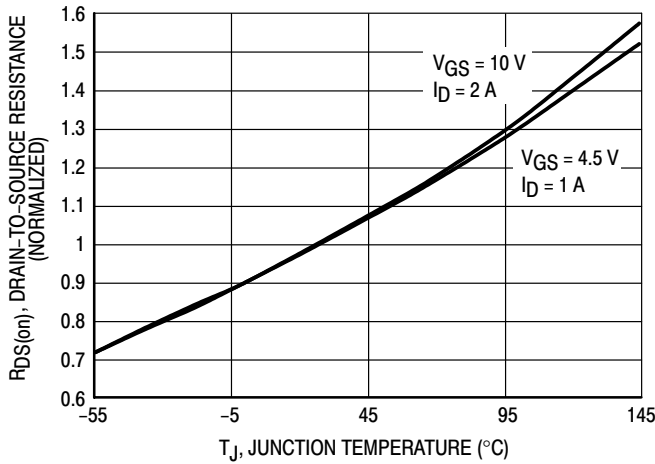


Figure 5. On-Resistance Variation with Temperature

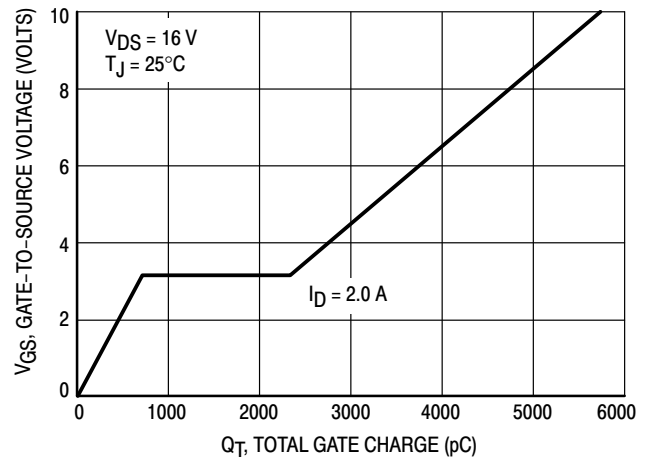


Figure 6. Gate Charge

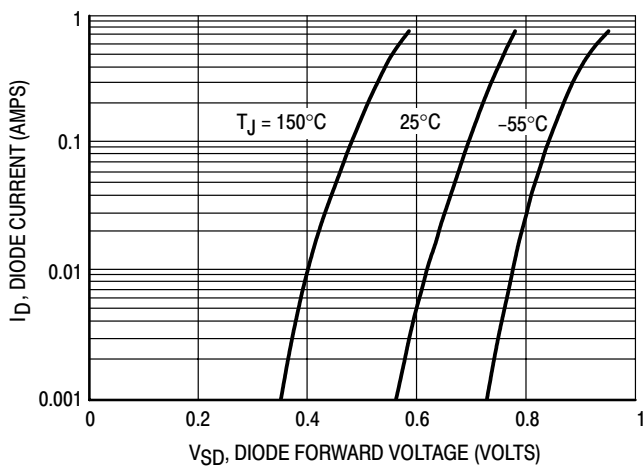


Figure 7. Body Diode Forward Voltage

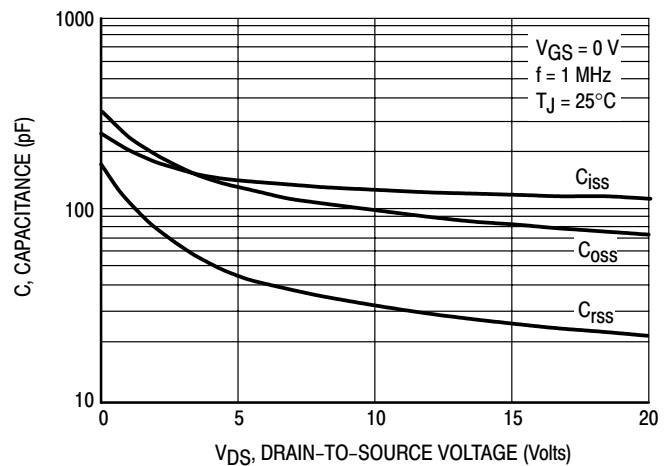
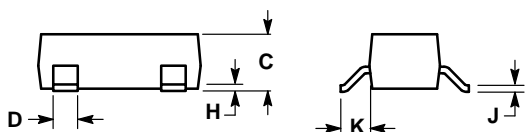
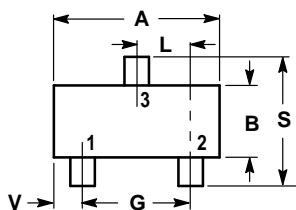


Figure 8. Capacitance

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SOT-23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

- PIN 1. BASE
 2. EMITTER
 3. COLLECTOR

