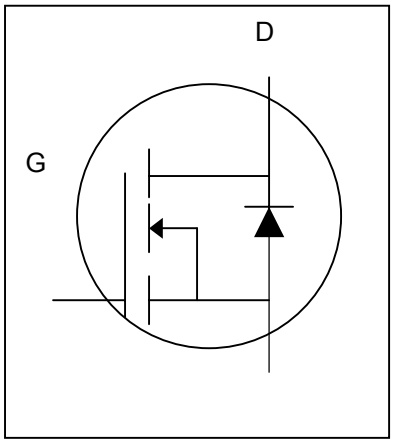
B06N60
N-Channel Power MOSFET

- Advanced Process Technology
- Ultra low On-Resistance Provides Higher Efficiency
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- IDSS and VDS (on) Specified at Elevated Temperature

DESCRIPTION

This high voltage MOSFET used an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation time. Designed for high voltage, high speed switching application in power supplies, converters and PWM motor controls, these devices are particularly well suited for bridge circuits where diode speed and commutating safe operation areas critical and offer additional and safety margin against unexpected voltage transients.



V_{DSS} = 600V

$R_{DS\ (on)}$ = 1.2 Ω

I_D = 6.0 A

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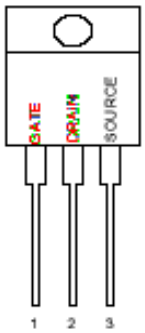

ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current – Continuous	I_D	6.0	A
Gate-to-Source Voltage – Continue - Non-repetitive	V_{GS} V_{GSM}	+/- 20 +/- 40	V V
Total Power Dissipation Derate Above 25℃	P_D	125 1.0	W W/℃
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	℃
Single Pulse Drain-to-Source Avalanche Energy – T_J = 25 ℃ (V_{DD} = 100V, V_{GS}= 10V, I_L =6A, L = 10mH, R_G=25Ω)	E_{AS}	180	mJ
Thermal Resistance – Junction to Case - Junction to Ambient	Θ_{JC} Θ_{JA}	1.0 62.5	℃/W
Maximum Led Temperature for Solding Purpose, 1/8" from case for 10 seconds	T_L	260	℃

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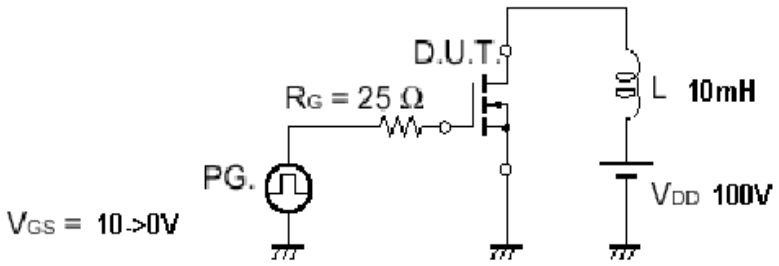
TEST CIRCUIT



Test Circuit – Avalanche Capability

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ELECTRICAL CHARACTERISTICS

Unless otherwise specified, T_J = 25℃.

Characteristic		Symbol	B06N60 Min	Typ	Max	Units
Drain-Source Breakdown Voltage (V_{GS} = 0 V, I_D = 250 μA)		$V_{(BR)DSS}$	600			V
Drain-Source Leakage Current (V_{DS} = 600 V, V_{GS} = 0 V)		I_{DSS}			100	μA
(V_{DS} = 480 V, V_{GS} = 0 V, T_J = 125℃)					50	
Gate-Source Leakage Current-Forward (V_{gsf} = 20 V, V_{DS} = 0 V)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse (V_{gsr} = 20 V, V_{DS} = 0 V)		I_{GSSR}			100	nA
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 μA)		$V_{GS(th)}$	2.0		4.0	V
Static Drain-Source On-Resistance (V_{GS} = 10 V, I_D = 3.5A) *		$R_{DS(on)}$			1.2	Ω
Forward Transconductance (V_{DS} = 15 V, I_D = 3.0A) *		g_{FS}	3.4			mhos
Input Capacitance	(V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz)	C_{iss}		1498	2100	pF
Output Capacitance		C_{oss}		158	220	pF
Reverse Transfer Capacitance		C_{rss}		29	60	pF
Turn-On Delay Time	(V_{DD} = 300 V, I_D = 6.0 A, V_{GS} = 10 V, R_G = 9.1Ω) *	$t_{d(on)}$		14	30	ns
Rise Time		t_r		19	40	ns
Turn-Off Delay Time		$t_{d(off)}$		40	80	ns
Fall Time		t_f		26	55	ns
Total Gate Charge	(V_{DS} = 300 V, I_D = 6.0 A, V_{GS} = 10 V)*	Q_g		35.5	50	nC
Gate-Source Charge		Q_{gs}		8.1		nC
Gate-Drain Charge		Q_{gd}		14.1		nC
Internal Drain Inductance (Measured from the drain lead 0.25" from package to center of die)		L_D		4.5		nH
Internal Drain Inductance (Measured from the source lead 0.25" from package to source bond pad)		L_S		7.5		nH
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	(I_S = 6.0 A, d_{IS}/d_t = 100A/μs)	V_{SD}		0.83	1.2	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		266		ns

* Pulse Test: Pulse Width ≦300μs, Duty Cycle ≦2%

** Negligible, Dominated by circuit inductance

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TYPICAL ELECTRICAL CHARACTERISTICS

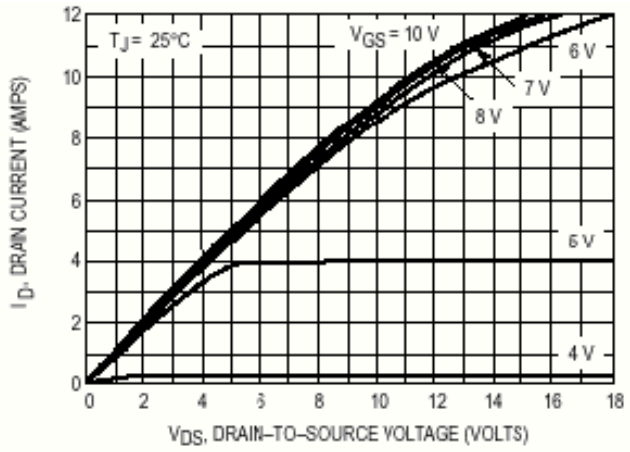

Figure 1. On–Region Characteristics

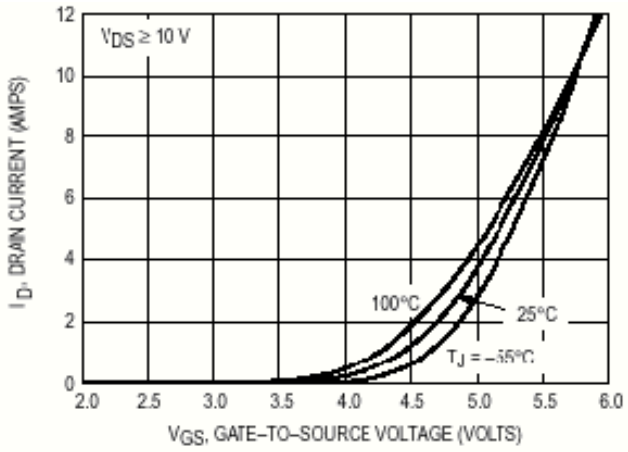

Figure 2. Transfer Characteristics

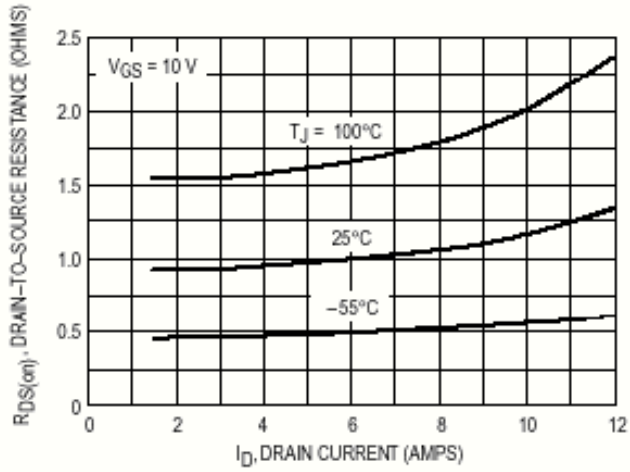

Figure 3. On–Resistance versus Drain Current and Temperature

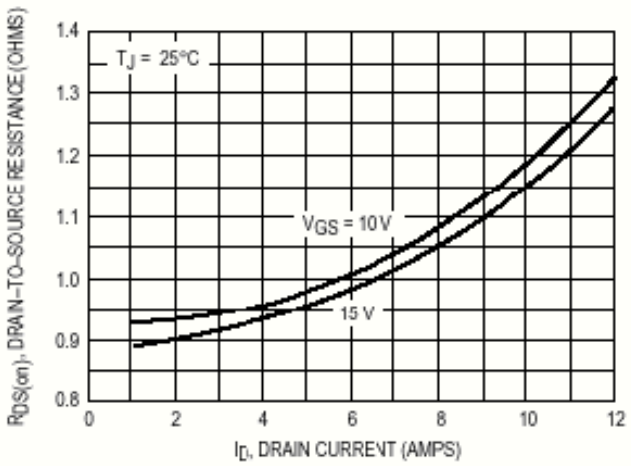

Figure 4. On–Resistance versus Drain Current and Gate Voltage

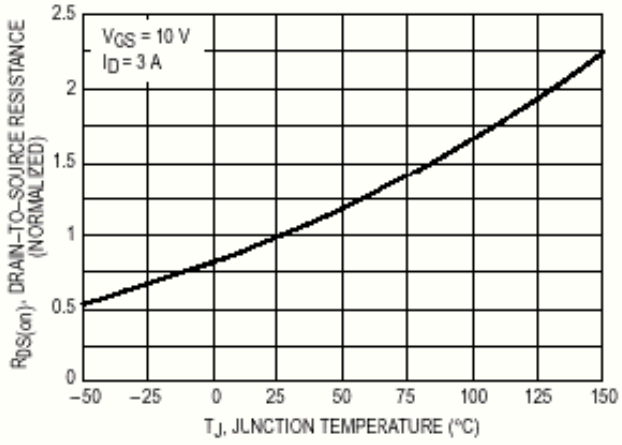

Figure 5. On–Resistance Variation with Temperature

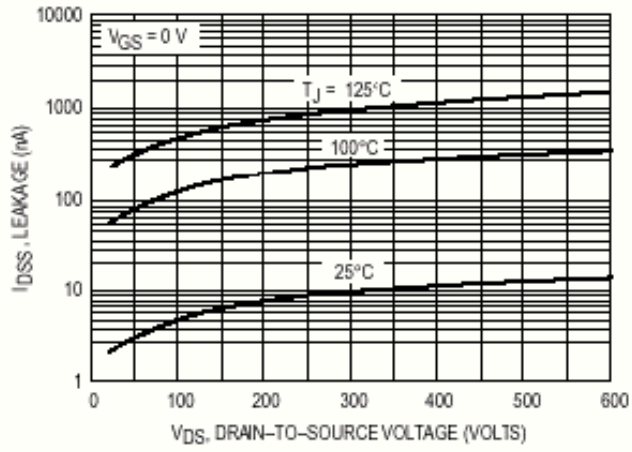

Figure 6. Drain–To–Source Leakage Current versus Voltage

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PACKAGE DIMENSION

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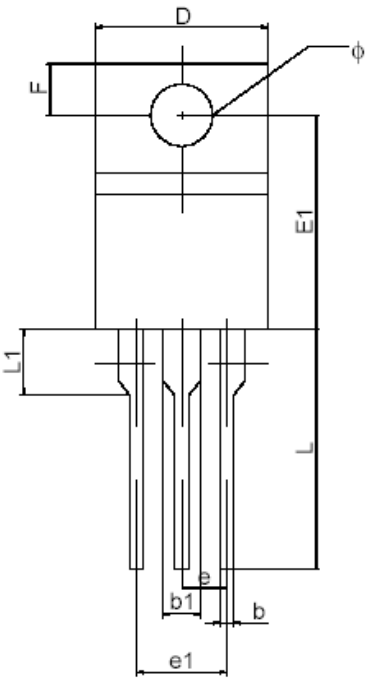
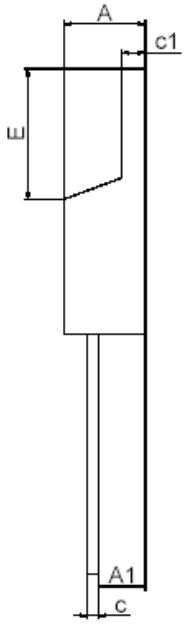


Front View



Side View

PIN 1: GATE
PIN 2: DRAIN
PIN 3: SOURCE

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.47	——	4.67	0.176	----	0.184
A1	2.62	——	2.82	0.099	----	0.111
b	0.71	——	0.91	0.028	----	0.036
b1	1.17	——	1.37	0.046	----	0.054
c	0.31	——	0.53	0.012	----	0.021
c1	1.17	——	1.37	0.046	----	0.054
D	10.01	——	10.21	0.394	----	0.402
E	8.50	——	8.90	0.335	----	0.350
E1	12.06	——	12.46	0.475	----	0.491
e	——	2.54	----	——	0.100	——
e1	4.98	——	5.18	0.196	----	0.204
F	2.69	——	2.89	0.106	----	0.114
L	13.40	——	13.80	0.528	----	0.543
L1	3.56	——	3.96	0.140	----	0.156
ϕ	3.79	——	3.89	0.149	----	0.153

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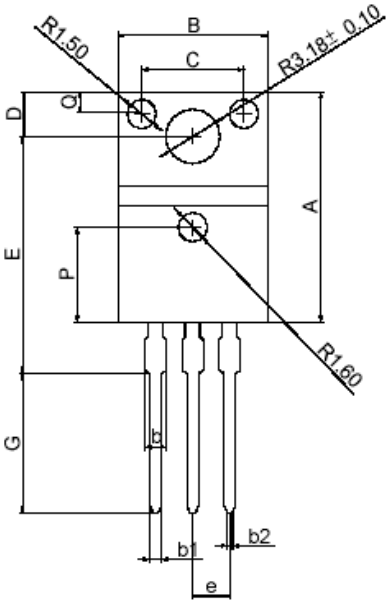
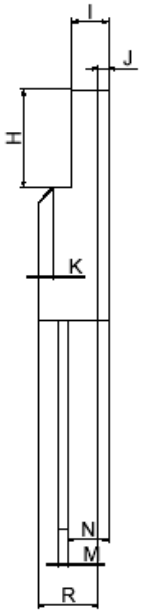
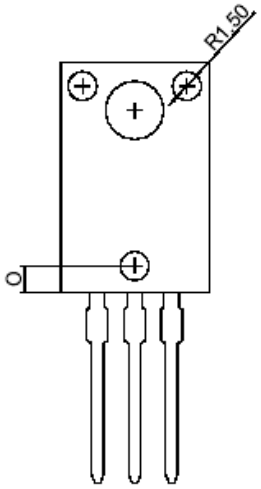


Front View



Side View



Back View

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	15.87	——	16.07	0.625	----	0.633
B	9.96	——	10.36	0.392	----	0.408
C	----	7.00	----	——	0.276	——
D	3.20	——	3.40	0.126	----	0.134
E	15.80	——	16.00	0.614	----	0.630
G	9.45	——	10.05	0.372	----	0.396
H	6.45	——	6.65	0.253	----	0.270
I	2.34	——	2.74	0.092	----	0.108
J	----	0.70	----	——	0.028	——
K	----	1.00	----	——	0.039	——
M	0.45	——	0.60	0.018	----	0.024
N	2.55	——	2.95	0.101	----	0.117
O	----	1.80	----	——	0.071	——
P	----	6.50	----	——	0.256	——
Q	----	1.80	----	——	0.069	——
R	4.50	——	4.90	0.177	----	0.193
b	----	——	1.47	——	----	0.058
b1	0.70	——	0.90	0.028	----	0.035
b2	0.35	——	0.45	0.010	----	0.018
e	----	2.54	----	——	0.100	——

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