

Preliminary_MSB15N60

N-Channel Enhancement Mode Power MOSFET

Description

The MSB15N60 is a N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-263 package is universally preferred for all commercial-industrial applications

Features

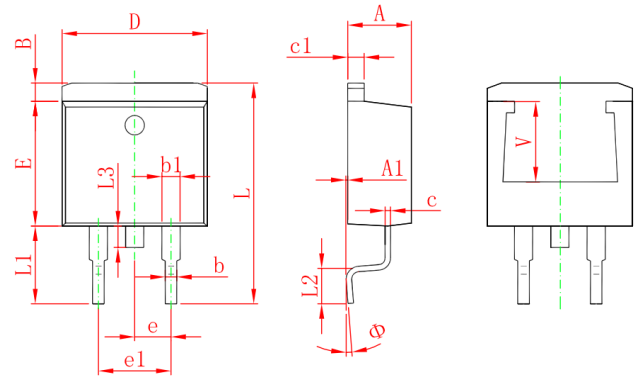
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

Application

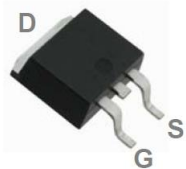
- Adapter
- Switching Mode Power Supply

Packing & Order Information

3M000/Reel

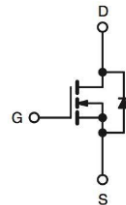


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
phi	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	



**RoHS
COMPLIANT**

Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current -Continuous ($T_C=25^\circ C$)	15	A
	Drain Current -Continuous ($T_C=100^\circ C$)	9.5	A
I_{DM}	Drain Current -Pulsed	60	A
I_{AR}	Avalanche Current	15	A
E_{AS}	Single Pulsed Avalanche Energy	245	mJ
E_{AR}	Repetitive Avalanche Energy	24	mJ
dV/dt	Peak Diode Recovery dV/dt	9.8	V/ns
T_J	Storage Temperature	150	$^\circ C$

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Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C
P_D	Total Power Dissipation (@TC = 25 °C) 245 W	245	W
	Derating Factor above 25 °C	2	W/°C
T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

Note:

- 1.Repetitive rating; pulse width limited by maximum junction temperature.
2. $I_{AS}=15A$, $V_{DD}=50V$, $L=0.5mH$, $R_G=25\Omega$, starting $T_J=+25^\circ C$.
3. $I_{SD}\leq 7.5A$, $dI/dt\leq 100A/\mu s$, $V_{DD}\leq BVDSS$, starting $T_J=+25^\circ C$.

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	--	0.93	°C/W
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient	--	62.5	

Static Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D=250\mu A$	2.0		4.0	V
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0 V$, $I_D=250\mu A$	600	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\mu A$, Referenced to 25°C	--	0.7	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 600 V$, $V_{GS} = 0 V$ $V_{DS} = 480 V$, $T_C = 125^\circ C$	--	--	1 10	μA
I_{GSS}	Gate-Body Leakage Current, Forward	$V_{GS} = \pm 30$	--	--	± 100	nA
* $R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10 V$, $I_D = 7.5 A$	--	0.45	0.52	Ω

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	$V_{DD} = 250 V$, $I_D = 15 A$, $V_{GS} = 10 V$, $R_G = 9.1 \Omega$	--	50	101	ns
t_r	Turn-On Time		--	78	162	ns
$t_{d(off)}$	Turn-Off Delay Time		--	120	261	ns
t_f	Turn-Off Fall Time		--	66	128	ns
C_{ISS}	Input Capacitance	$V_{DS} = 25 V$, $V_{GS} = 0 V$, $f = 1.0MHz$	--	2270	3000	pF
C_{OSS}	Output Capacitance		--	300	405	pF
C_{RSS}	Reverse Transfer Capacitance		--	23	37	pF

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Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	$V_{DD} = 250\text{ V}, I_D = 15\text{ A},$ $V_{GS} = 10\text{ V}$	--	36	60	nC
Q_{gs}	Gate-Source Charge		--	9	--	nC
Q_{gd}	Gate-Drain Charge		--	16	--	nC

Source-Drain Diode						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S		$V_D = V_G = 0,$ $V_S = 1.3\text{ V}$	--	--	14	A
I_{SM}			--	--	60	
V_{SD}		$I_S = 15\text{ A}, V_{GS} = 0\text{ V}$	--	--	1.4	V
t_{rr}		$I_F = 15\text{ A}, V_{GS} = 0\text{ V}$ $diF/dt = 100\text{ A/us}$	--	600	--	ns
Q_{rr}			--	7.2	--	uC

*Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

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