MSB190N10

N-Channel 100-V (D-S) MOSFET

Description

The MSB190N10 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

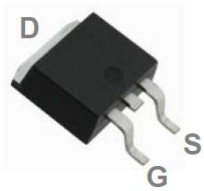
- Low rDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

Application

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

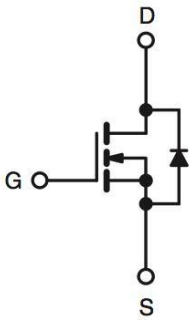
Packing & Order Information

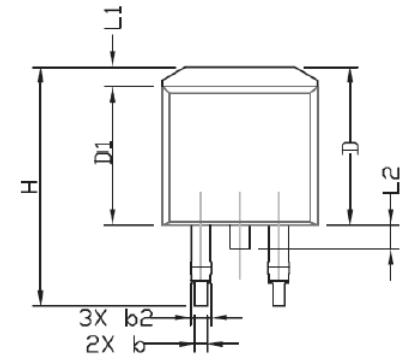
50/Tube ; 1,000/Box

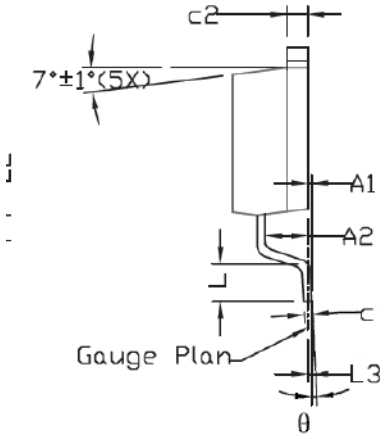


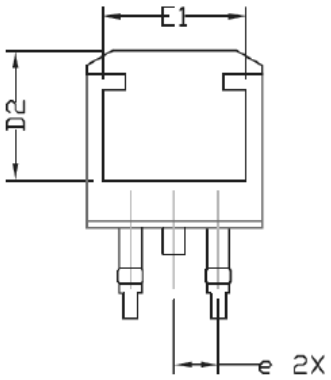
RoHS COMPLIANT

Graphic symbol









TO-263						
Symbol	Dimensional Reqmts			Inches Reqmts		
	Min	Nom	Max	Min	Nom	Max
A	4.3	4.57	4.72	0.169	0.180	0.186
A1	0	-	0.25	0.000	-	0.010
A2	2.47	2.57	2.67	0.097	0.101	0.105
b	0.69	0.813	0.94	0.027	0.032	0.037
b2	1.17	1.27	1.45	0.046	0.050	0.057
c	0.48	0.5	0.6	0.019	0.020	0.024
c2	1.17	1.27	1.37	0.046	0.050	0.054
D	9.8	10.05	10.3	0.386	0.396	0.406
D1	8.64	8.78	9.65	0.340	0.346	0.380
D2	7.12	7.37	7.62	0.280	0.290	0.300
e	9.7	10.15	10.54	0.382	0.400	0.415
e1	8	8.2	8.4	0.315	0.323	0.331
E	2.54 BSC			0.100 BSC		
H	14.99	15.24	15.49	0.590	0.600	0.610
L	1.78	2.29	2.79	0.070	0.090	0.110
L1	1.02	1.27	1.52	0.040	0.050	0.060
L2	-	-	1.75	-	-	0.069
L3	-	0.254	-	-	0.010	-
θ	0℃	-	8℃	0℃	-	8℃

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[a] (T_C=25°C)	190	A
	Continuous Drain Current[a] (T_C =70°C)	158	A
I_{DM}	Pulsed Drain Current[b]	750	A
I_S	Continuous Source Current (Diode Conduction)[a]	190	A
P_D	Power Dissipation[a] (T_C =25°C)	300	W
	Power Dissipation[a] (T_C =70°C)	150	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +175	°C

THERMAL RESISTANCE RATINGS

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient[a]	62.5	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case	0.5	

Notes

a. Package Limited

b. Pulse width limited by maximum junction temperature

c. Surface Mounted on 1" x 1" FR4 Board.

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V_{GS}	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D =-250μA	1			V
I_{GSS}	Gate-Body Leakage	V_{DS} = 0 V , V_{GS} = ±20 V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80 V , V_{GS} = 0 V V_{DS} = 80 V , V_{GS} = 0 V , T_J= 55°C			1 10	uA
$I_{D(on)}$	On-State Drain Current[A]	V_{DS} = 5 V, V_{GS} = 10 V	240			A
$R_{DS(on)}$	Drain-Source On-Resistance[A]	V_{GS} = 10 V, I_D = 45 A V_{GS} = 5.5 V , I_D = 44 A			4 5.5	mΩ
g_{fs}	Forward Tranconductance[A]	V_{DS} = 15 V , I_D = 20 A		19		S
V_{SD}	Diode Forward Voltage	I_S = 95 V , V_{GS} = 0 V		1		V

Dynamic[b]

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 50 V , R_L = 2.5 Ω, V_{GEN} = 10 V , R_{GEN} = 6 Ω I_D = 20 A	--	38	--	ns
t_r	Rise Time		--	25	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	283	--	ns
tf	Fall Time		--	60	--	ns

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Dynamic[b]						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = 50 V , I_D = 20 A V_{GS} = 5.5 V	--	140	--	nC
Q_{gs}	Gate-Source Charge		--	50	--	nC
Q_{gd}	Gate-Drain Charge		--	33	--	nC
C_{ISS}	Input Capacitance	V_{GS} = 0 V , V_{DS} = 15 V , f = 1MHz	--	12354	--	pF
C_{OSS}	Output Capacitance		--	516	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	422	--	pF

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

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■Typical Electrical Characteristics

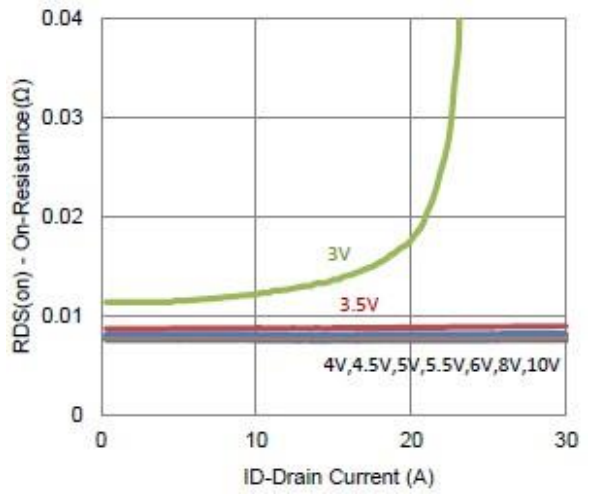

FIG.1-ON-RESISTANCE VS. DRAIN CURRENT

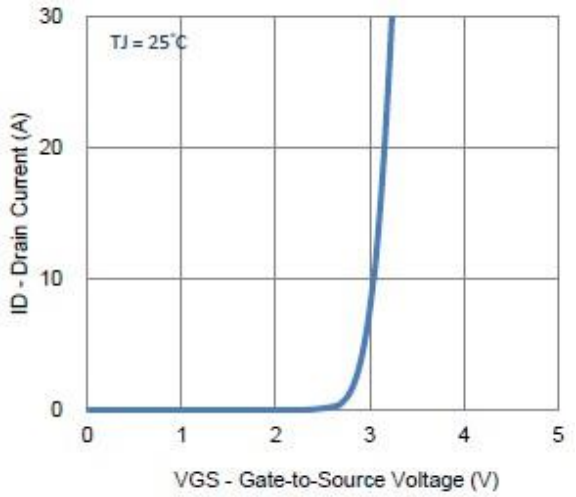

FIG.2-TRANSFER CHARACTERISTICS

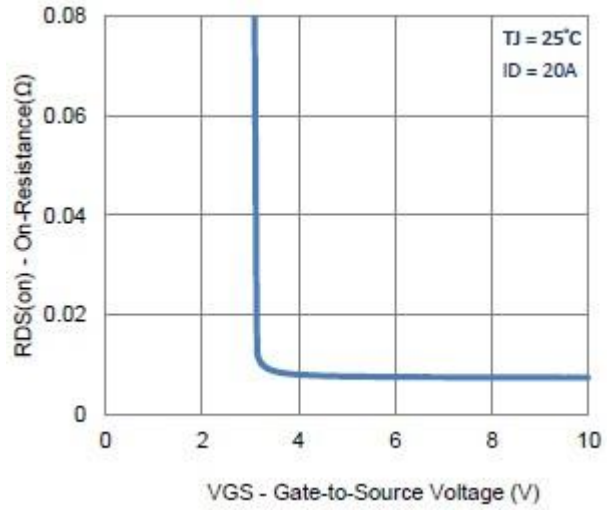

FIG.3- ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE

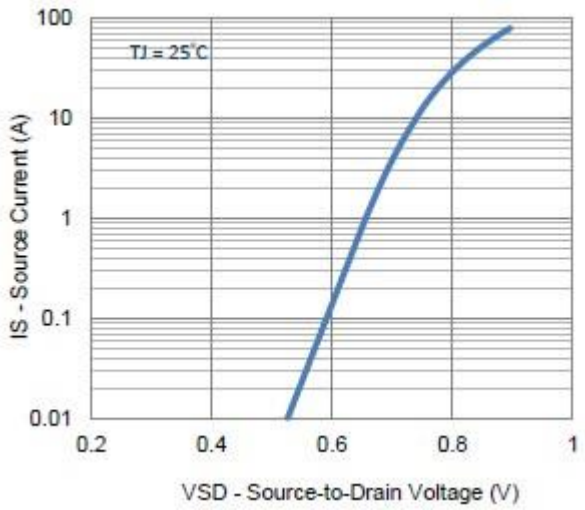

FIG.4-DRAIN-TO SOURCE FORWARD WOLTAGE

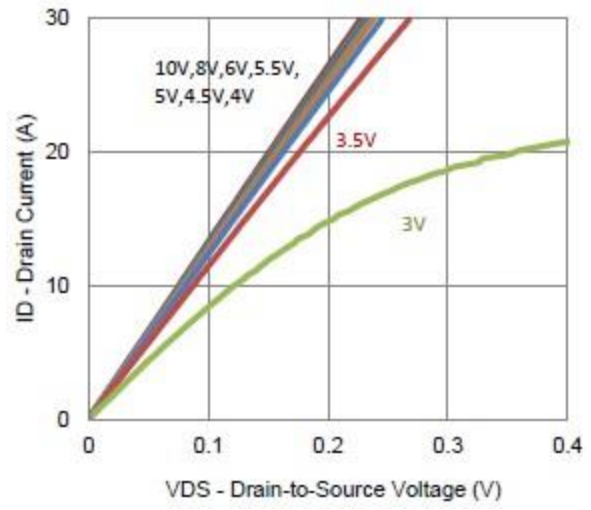

FIG.5-OUTPUT CHARACTERISTICS

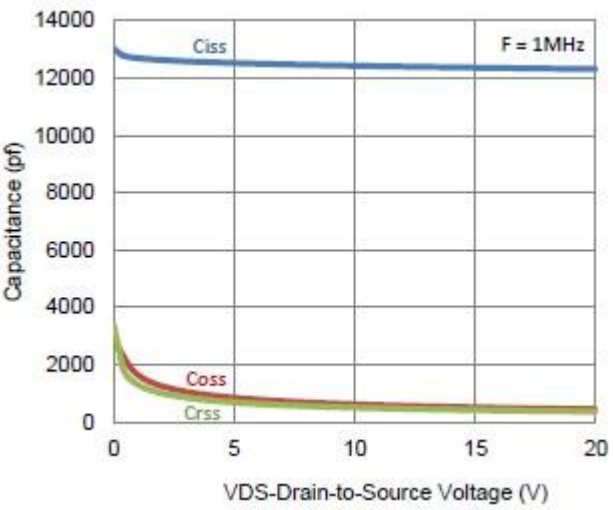

FIG.6-CAPACITANCE

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■Typical Electrical Characteristics

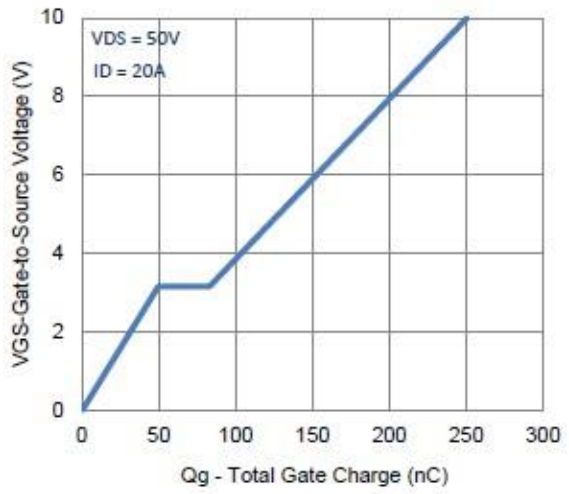

FIG.7-GATE CHARGE

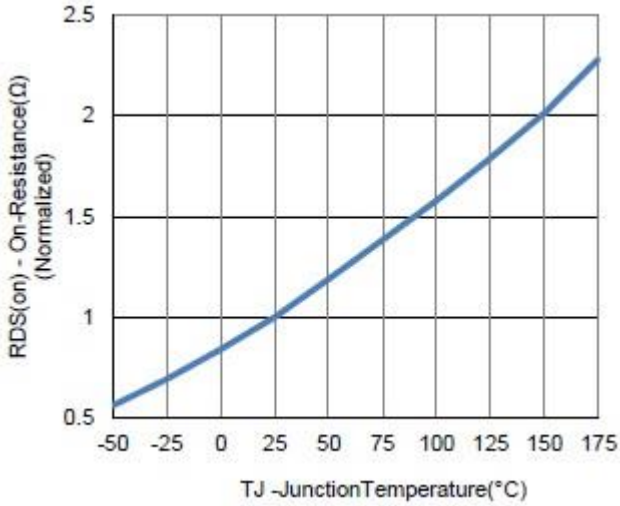

FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

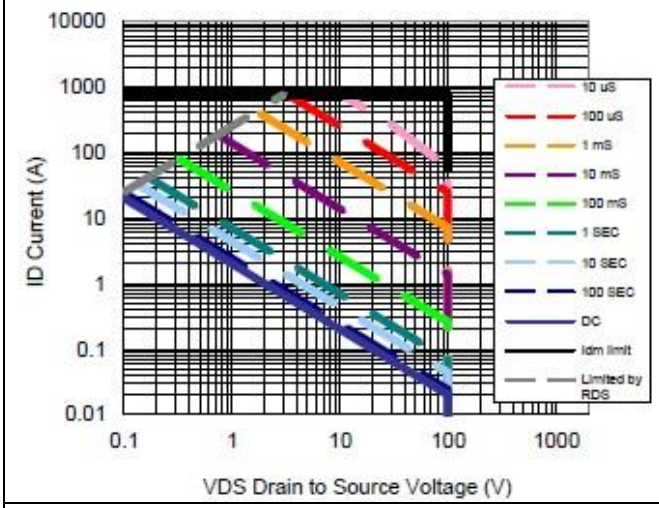

FIG.9-SAFE OPERATING AREA

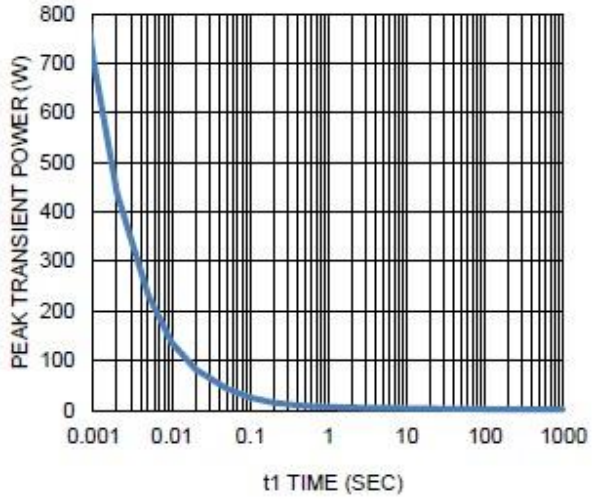

FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

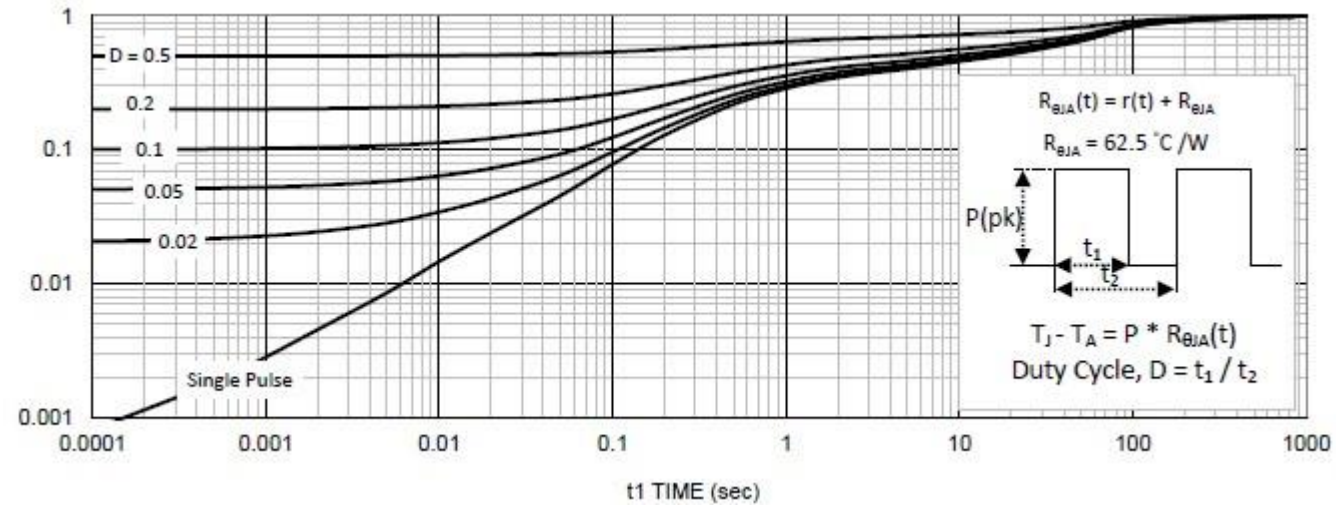

FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

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