

MSB90N10

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

Description

The MSB90N10 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

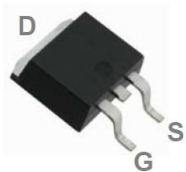
- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

Application

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

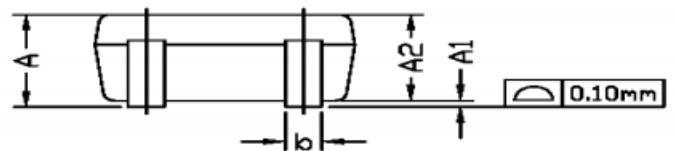
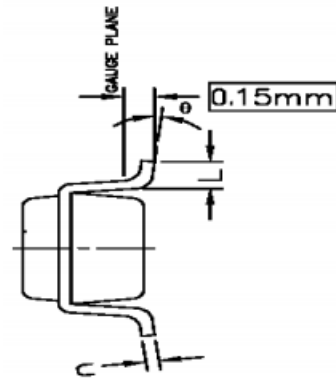
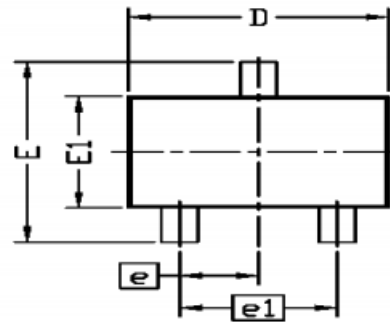
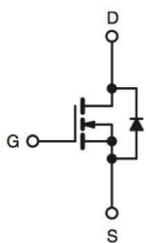
Packing & Order Information

3,000/Reel



**RoHS
COMPLIANT**

Graphic symbol



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	—	—	1.10	—	—	0.043
A1	0.00	—	0.10	0.00	—	0.004
A2	0.7	0.9	1.00	0.028	0.035	0.039
b	0.15	—	0.30	0.006	—	0.012
c	0.08	—	0.22	0.003	—	0.009
D	1.85	2.10	2.15	0.073	0.083	0.085
E	1.80	2.30	2.40	0.071	0.091	0.094
e	0.65 BSC			0.026 BSC		
e1	1.30 BSC			0.051 BSC		
E1	1.1	1.30	1.4	0.043	0.051	0.055
L	0.26	0.36	0.46	0.010	0.014	0.018
θ	0°	4°	8°	0°	4°	8°

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	90	A
	Continuous Drain Current ^a ($T_C=70^\circ\text{C}$)	90	A
I_{DM}	Pulsed Drain Current ^b	360	A
I_S	Continuous Source Current (Diode Conduction) ^a	90	A
P_D	Power Dissipation ^a ($T_C=25^\circ\text{C}$)	300	W
	Power Dissipation ^a ($T_C=70^\circ\text{C}$)	150	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +175	$^\circ\text{C}$

Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient ^a	62.5	$^\circ\text{C/W}$
$R_{\theta JC}$	Maximum Junction-to-Case	0.5	

Notes

- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	1			V
I_{GSS}	Gate-Body Leakage	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$ $V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			1 25	μA
$I_{D(on)}$	On-State Drain Current ^A	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	120			A
$R_{DS(on)}$	Drain-Source On-Resistance ^A	$V_{GS} = 10\text{ V}, I_D = 45\text{ A}$ $V_{GS} = 5.5\text{ V}, I_D = 44\text{ A}$			7 9	m Ω
g_{fs}	Forward Transconductance ^A	$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$		22		S
V_{SD}	Diode Forward Voltage	$I_S = 45\text{ V}, V_{GS} = 0\text{ V}$		1.1		V

Dynamic^b

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 50\text{ V}, R_L = 2.5\ \Omega,$ $V_{GEN} = 10\text{ V}, R_{GEN} = 6\ \Omega,$ $I_D = 20\text{ A}$	--	30	--	ns
t_r	Rise Time		--	58	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	230	--	ns
t_f	Fall Time		--	87	--	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	--	114	--	nC
Q _{gs}	Gate-Source Charge		--	28	--	nC
Q _{gd}	Gate-Drain Charge		--	72	--	nC
C _{ISS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 15 V, f = 1MHz	--	9235	--	pF
C _{OSS}	Output Capacitance		--	811	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	752	--	pF

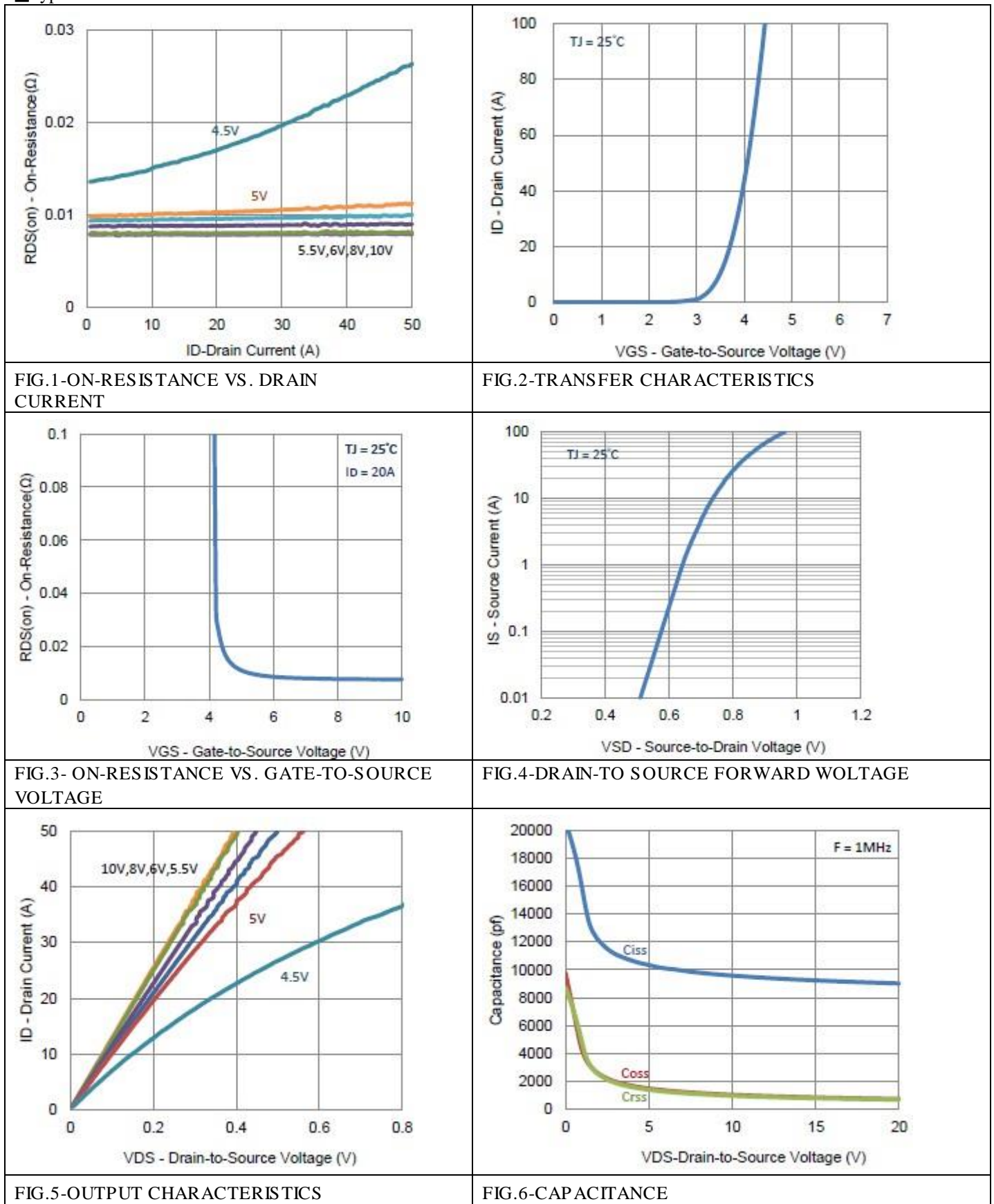
Notes

- a. Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

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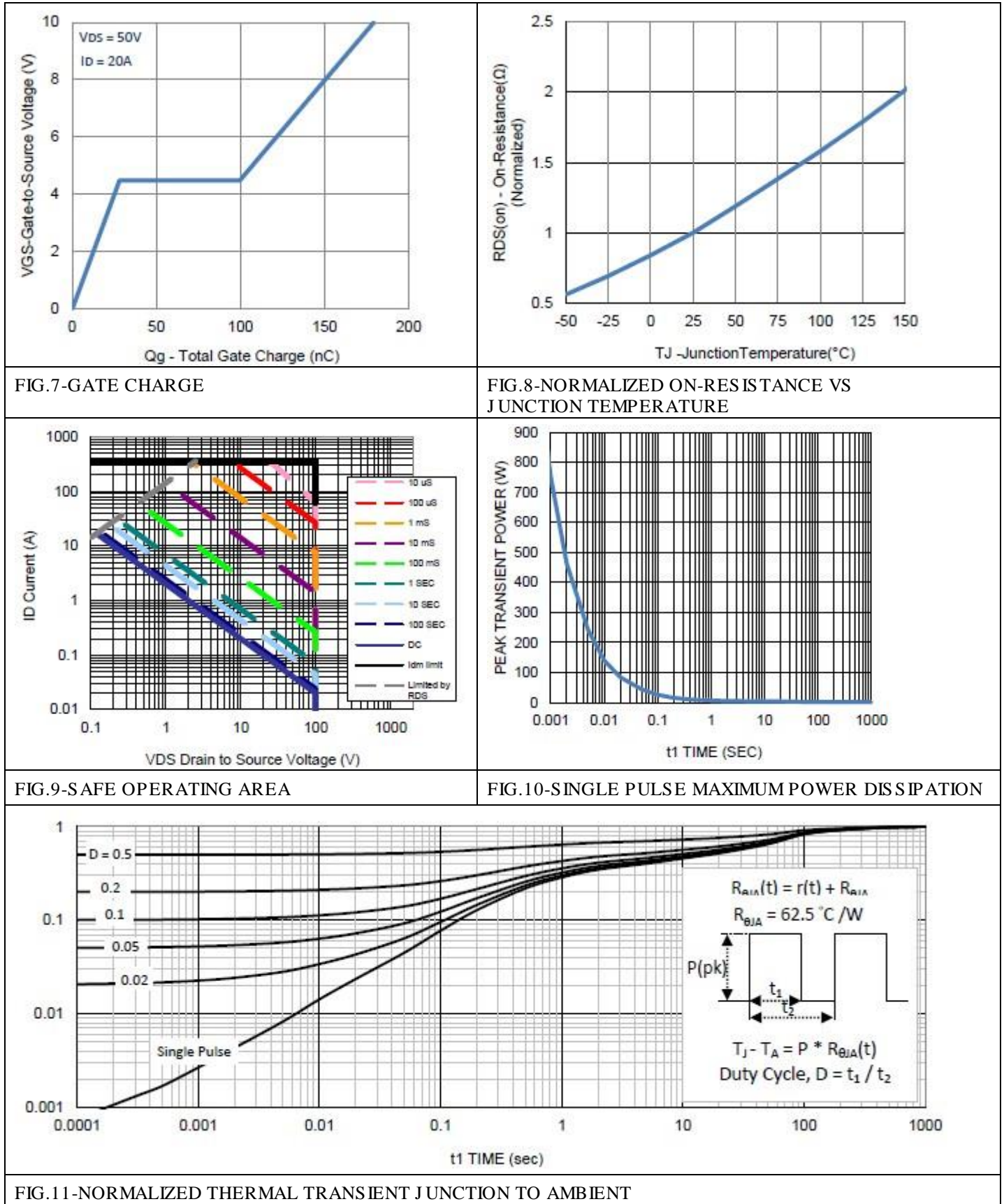
Typical Electrical Characteristics



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Disclaimer

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