

MS90N06

N-Channel 60-V (D-S) MOSFET

Features

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

Applications:

- Power Routing
- Li Ion Battery Packs
- Level Shifting and Driver Circuits

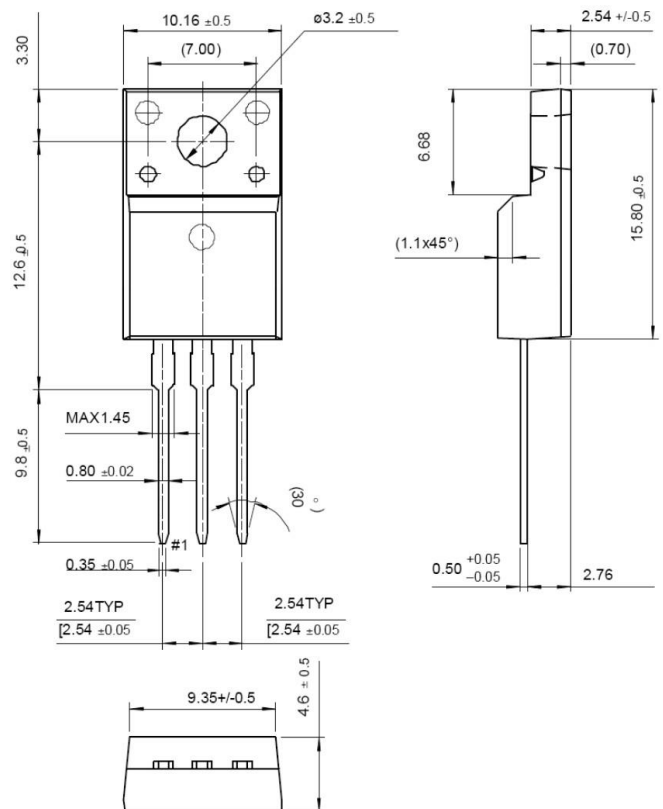
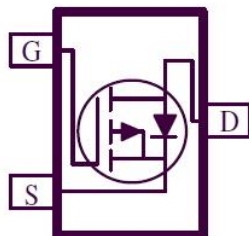
Packing & Order Information

3,000/Reel



RoHS
COMPLIANT

Graphic symbol



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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	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ^a ($T_A=25^{\circ}\text{C}$)	90	A
I_{DM}	Pulsed Drain Current ^a	360	A
I_S	Continuous Source Current (Diode Conduction) ^a	90	A
P_D	Power Dissipation ^a ($T_A=25^{\circ}\text{C}$)	300	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	1	

Notes

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

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	$V_{DS} = 48\text{ V}$, $V_{GS} = 0\text{ V}$ $V_{DS} = 48\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55^{\circ}\text{C}$			1 25	μA
$I_{D(on)}$	On-State Drain Current	$V_{DS} = 5\text{ V}$, $V_{GS} = 10\text{ V}$	120			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS} = 10\text{ V}$, $I_D = 45\text{ A}$ $V_{GS} = 5.5\text{ V}$, $I_D = 44\text{ A}$			3 4	m Ω
g_{fs}	Forward Transconductance	$V_{DS} = 15\text{ V}$, $I_D = 20\text{ A}$		35		S
V_{SD}	Diode Forward Voltage	$I_S = 45\text{ V}$, $V_{GS} = 0\text{ V}$		0.84		V

Dynamic^b

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 30\text{ V}$, $R_L = 1.5\text{ }\Omega$, $V_{GEN} = 10\text{ V}$, $R_{GEN} = 6\text{ }\Omega$ $I_D = 20\text{ A}$	--	64	--	ns
t_r	Rise Time		--	112	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	276	--	ns
t_f	Fall Time		--	86	--	ns

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Dynamic ^b						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	$V_{DS} = 30\text{ V}$, $I_D = 20\text{ A}$ $V_{GS} = 5.5\text{ V}$	--	161	--	nC
Q_{gs}	Gate-Source Charge		--	58	--	nC
Q_{gd}	Gate-Drain Charge		--	82	--	nC
C_{ISS}	Input Capacitance	$V_{GS} = 0\text{ V}$, $V_{DS} = 15\text{ V}$, $f = 1\text{ MHz}$	--	33061	--	pF
C_{OSS}	Output Capacitance		--	1181	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	1135	--	pF

Notes

- a. Pulse test: $PW \leq 300\mu s$ duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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■ Typical Electrical Characteristics

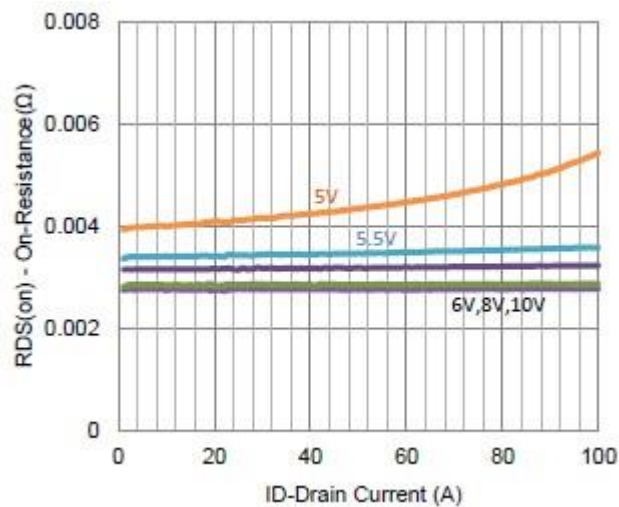


FIG.1-ON-RESISTANCE VS. DRAIN CURRENT

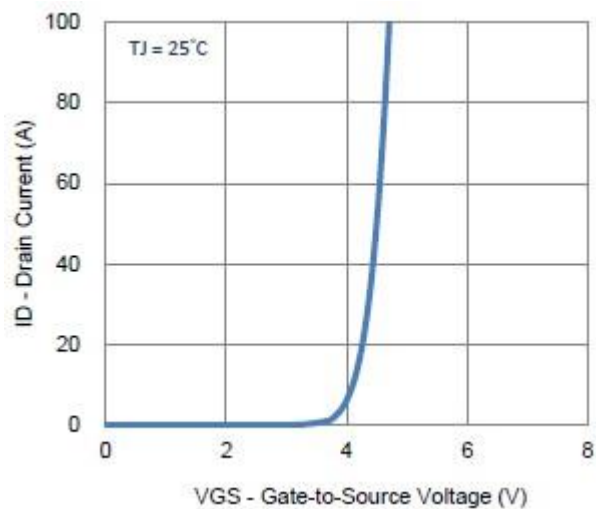


FIG.2-TRANSFER CHARACTERISTICS

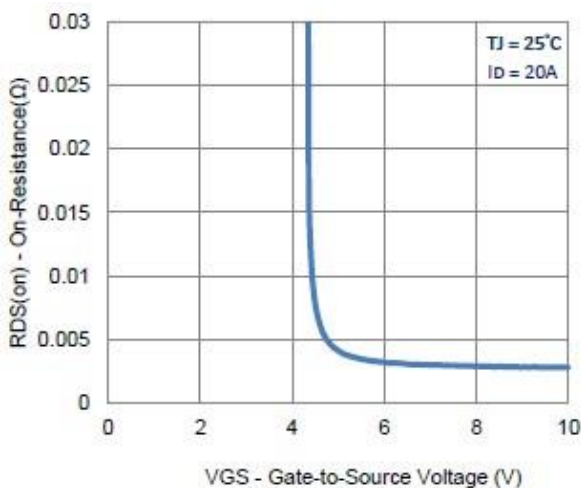


FIG.3- ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE

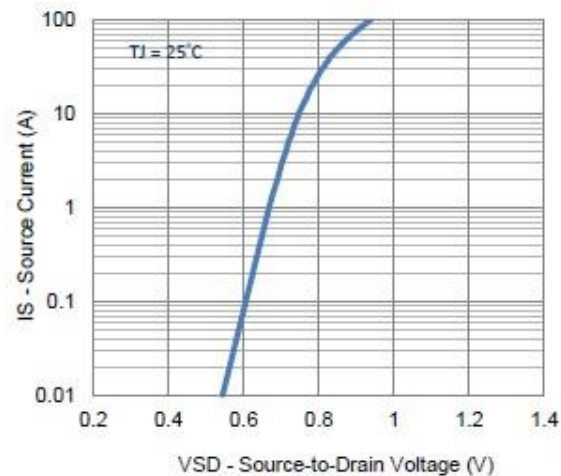


FIG.4-DRAIN TO SOURCE FORWARD VOLTAGE

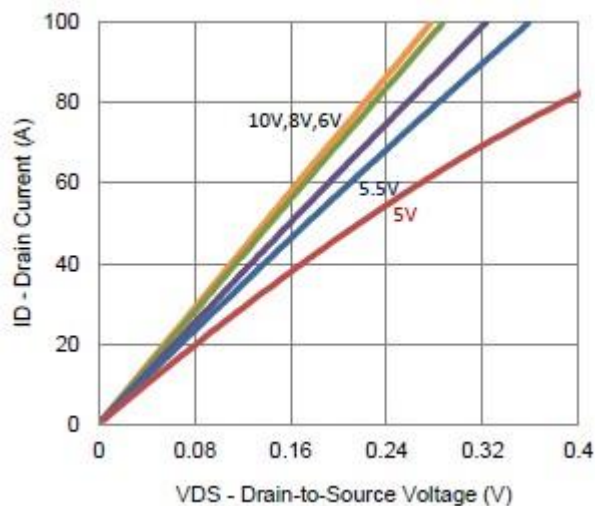


FIG.5-OUTPUT CHARACTERISTICS

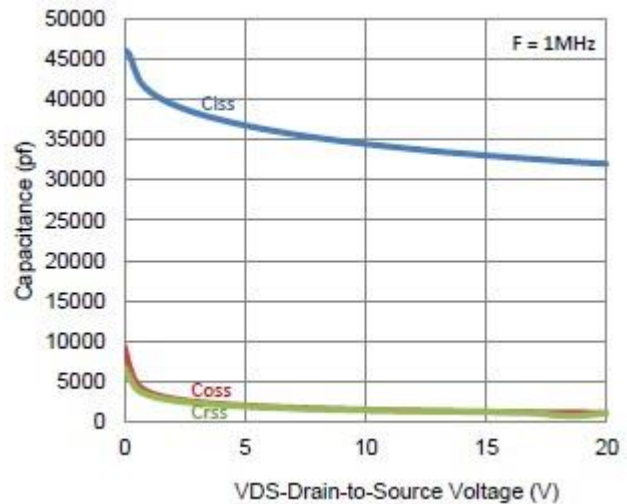


FIG.6-CAPACITANCE

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Typical Electrical Characteristics

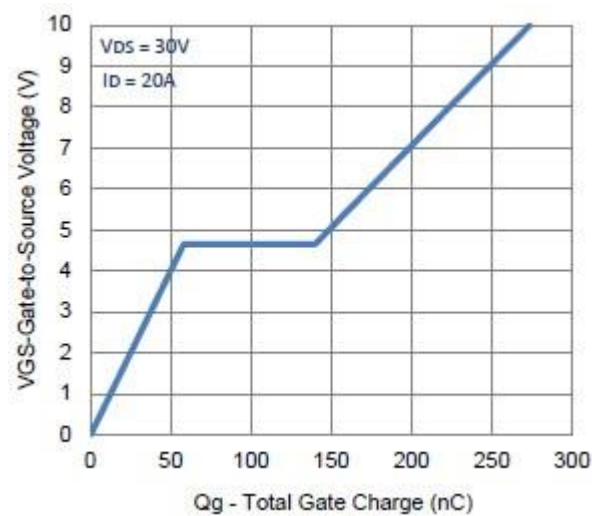


FIG.7-GATE CHARGE

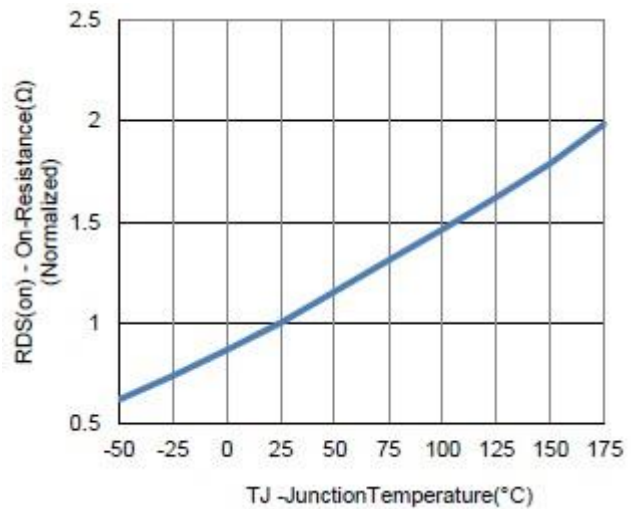


FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

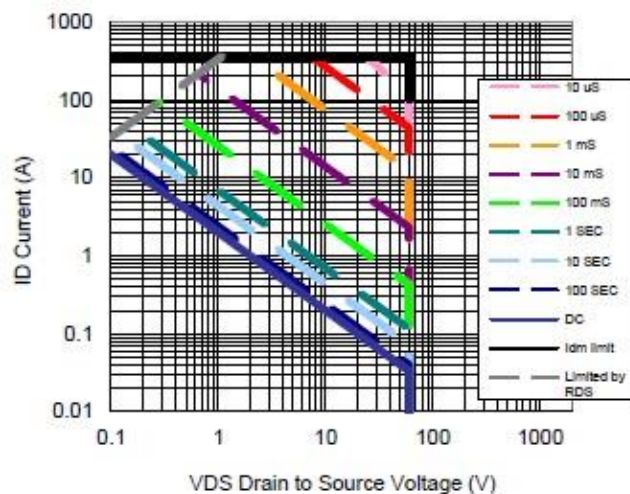


FIG.9-SAFE OPERATING AREA

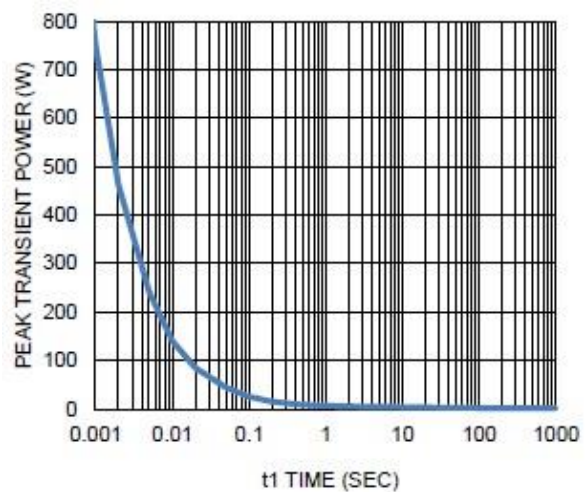


FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

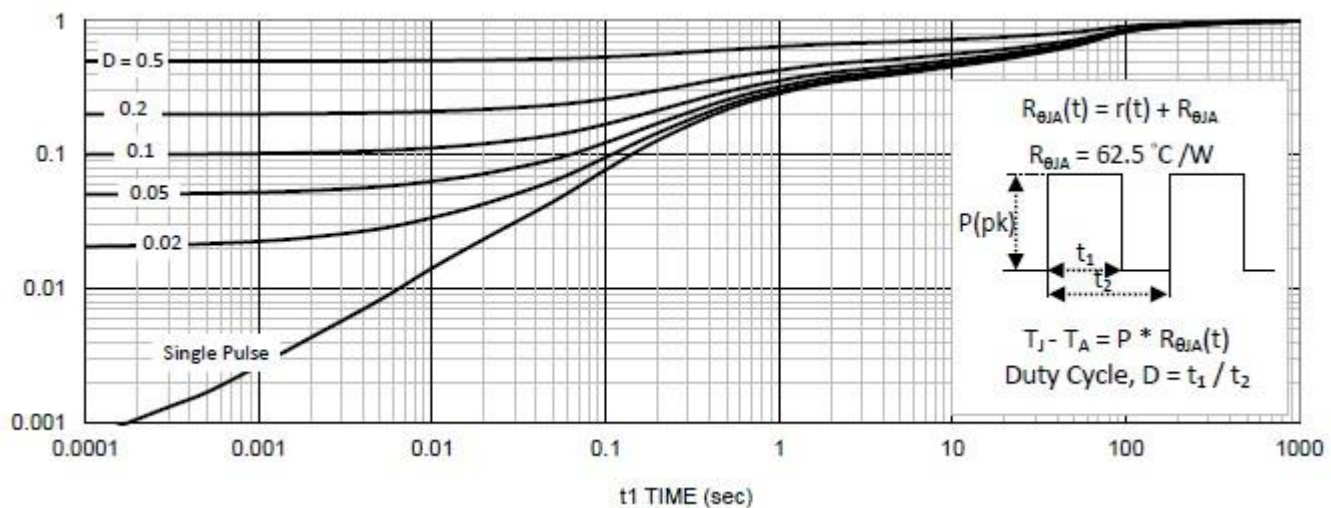


FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

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