MS90N06

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

Features

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

Applications:

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

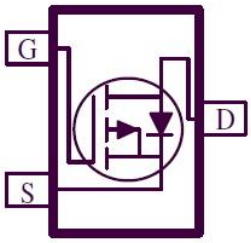
Package type：TO-220AB

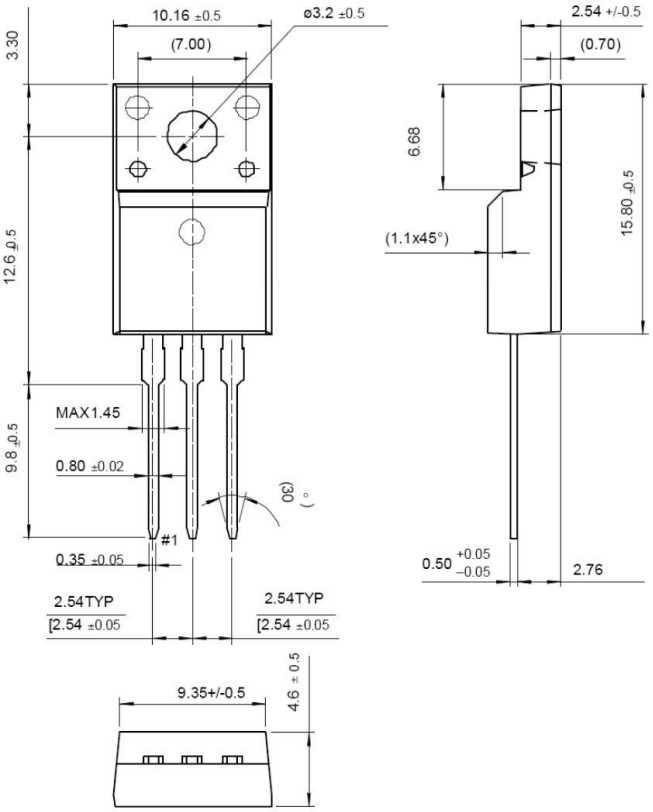
Packing & Order Information

50/Tube ; 1,000/Box

RoHS COMPLIANT

Graphic symbol





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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	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[a] (T_A=25°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°C)	300	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	1	

Notes

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

b. 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 =-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} = 48 V , V_{GS} = 0 V V_{DS} = 48 V , V_{GS} = 0 V , T_J= 55°C			1 25	uA
$I_{D(on)}$	On-State Drain Current	V_{DS} = 5 V, V_{GS} = 10 V	120			A
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 45 A V_{GS} = 5.5 V , I_D = 44 A			3 4	mΩ
g_{fs}	Forward Tranconductance	V_{DS} = 15 V , I_D = 20 A		35		S
V_{SD}	Diode Forward Voltage	I_S = 45 V , V_{GS} = 0 V		0.84		V

Dynamic[b]

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	V_{DS} = 30 V , R_L = 1.5 Ω, V_{GEN} = 10 V , R_{GEN} = 6 Ω I_D = 20 A	--	64	--	ns
t_r	Rise Time		--	112	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	276	--	ns
tf	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 V , I_D = 20 A V_{GS} = 5.5 V	--	161	--	nC
Q_{gs}	Gate-Source Charge		--	58	--	nC
Q_{gd}	Gate-Drain Charge		--	82	--	nC
C_{ISS}	Input Capacitance	V_{GS} = 0 V , V_{DS} = 15 V , f = 1MHz	--	33061	--	pF
C_{OSS}	Output Capacitance		--	1181	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	1135	--	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

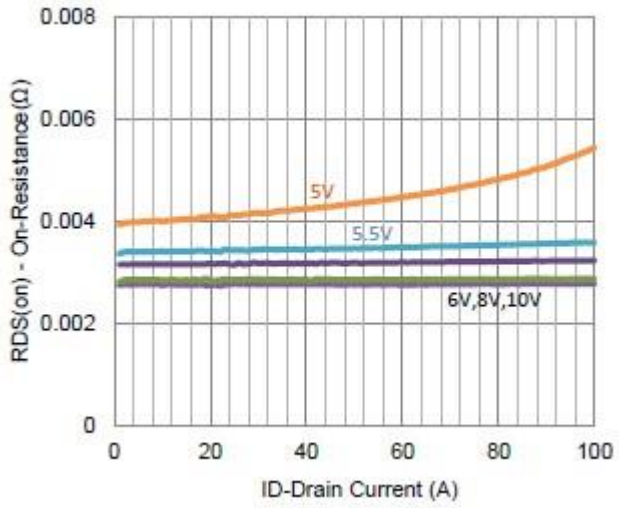

FIG.1-ON-RESISTANCE VS. DRAIN CURRENT

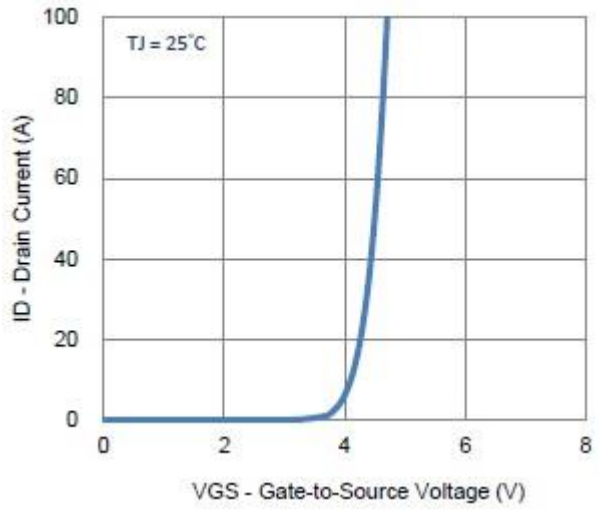

FIG.2-TRANSFER CHARACTERISTICS

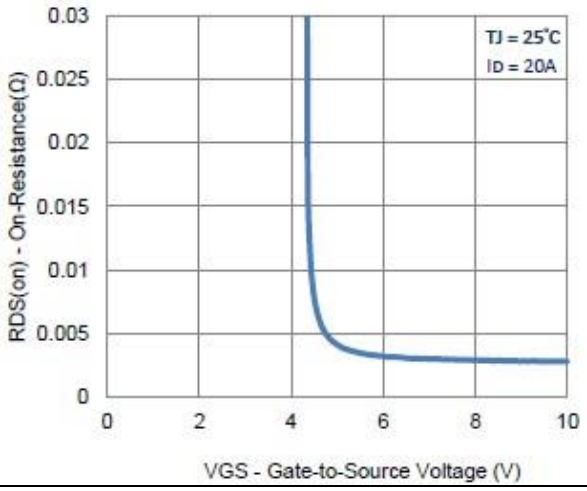

FIG.3- ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE

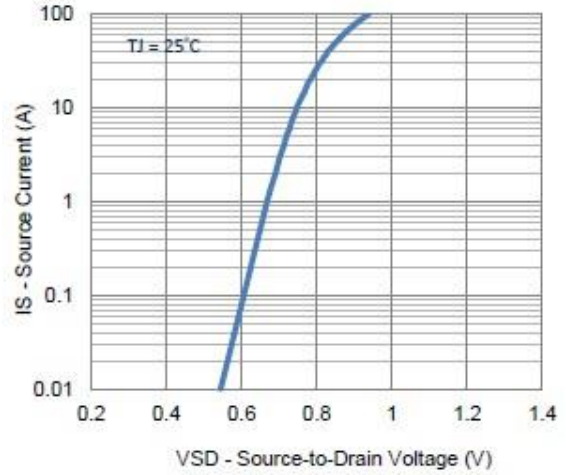

FIG.4-DRAIN-TO SOURCE FORWARD WOLTAGE

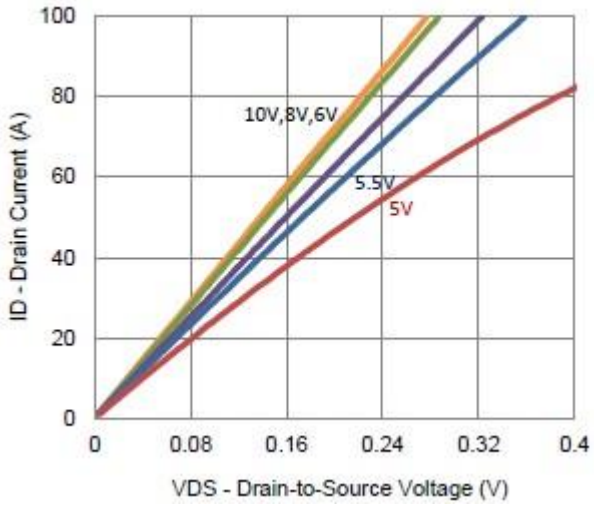

FIG.5-OUTPUT CHARACTERISTICS

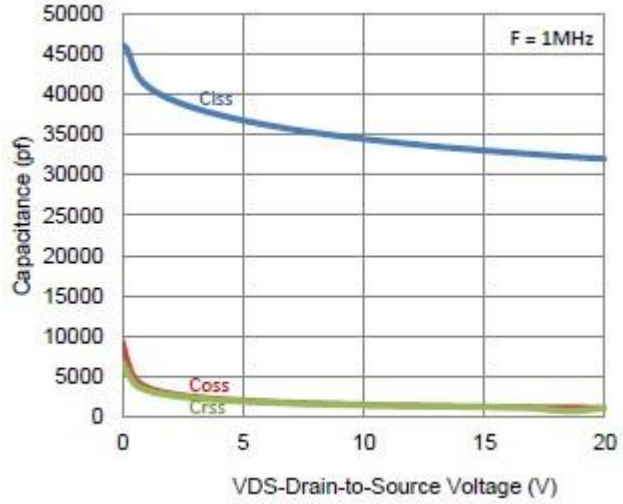

FIG.6-CAPACITANCE

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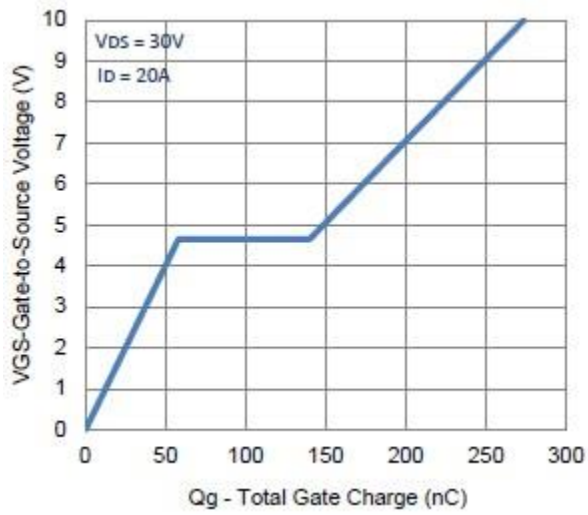

FIG.7-GATE CHARGE

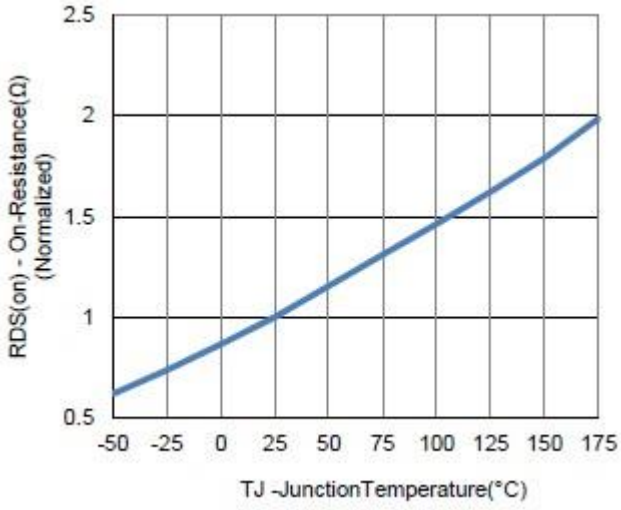

FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

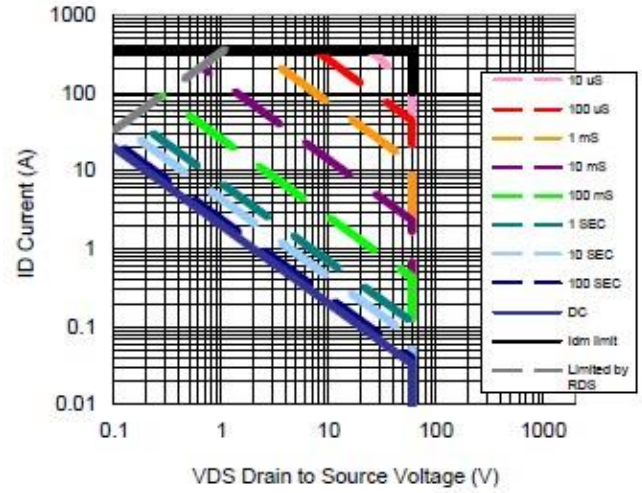

FIG.9-SAFE OPERATING AREA

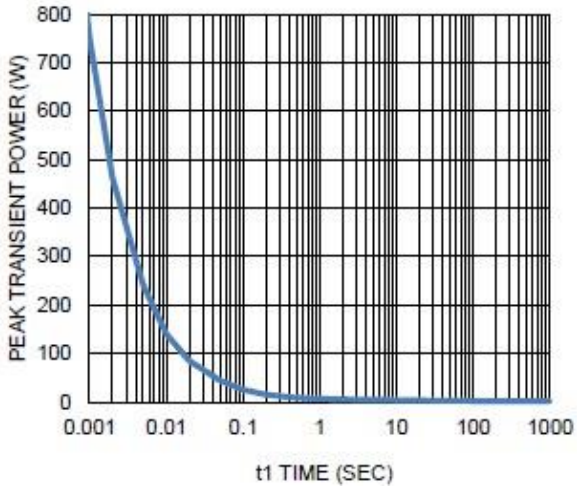

FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

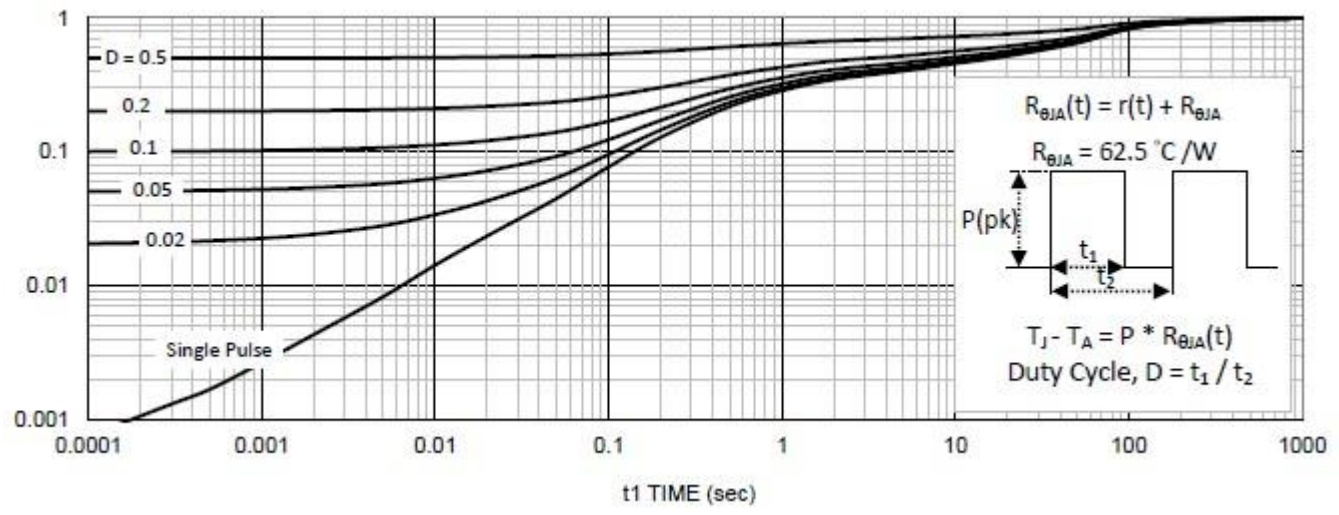

FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

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