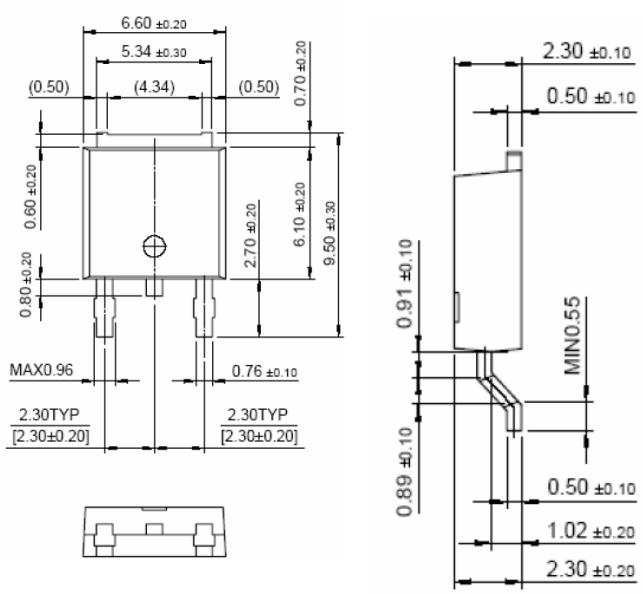
MS70N03

P-Channel 30-V (D-S) MOSFET

Description

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low rDS(on) and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

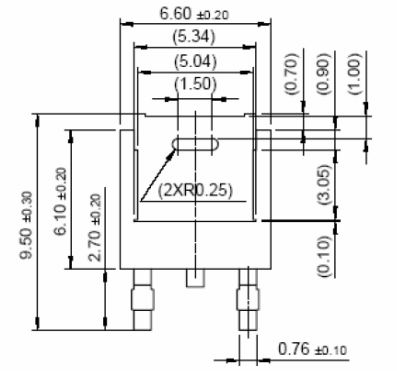


Features

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

Typical Applications:

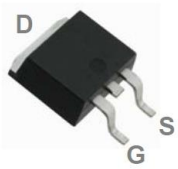
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits



Packing & Order Information

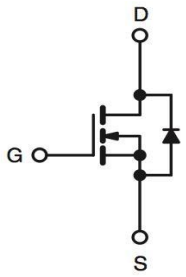
Part No./ T：2,500/Tape&Reel

Part No./ R：80/Tube , 4,000/Box



RoHS COMPLIANT

Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[a] (T_A=25°C)	75	A
I_{DM}	Pulsed Drain Current[b]	300	A
I_S	Continuous Source Current (Diode Conduction)[a]	30	A

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P-Channel 30-V (D-S) MOSFET

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)			
Symbol	**Parameter**	**Value**	**Unit**
P_D	Power Dissipation[a] (T_A =25°C)	50	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +175	°C
$R_{\theta JA}$	Maximum Junction-to-Ambient[a] (t <= 10 sec)	40	°C/W
$R_{\theta JC}$	Maximum Junction-to-Ambient[a] (Steady-State)	3	

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**
$V_{GS(th)}$	Gate-Source 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} = 24 V , V_{GS} = 0 V V_{DS} = 24 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_{DS} = 10 V, I_D = 20 A V_{GS} = 4.5 V, I_D = 18 A			6 8	mΩ
g_{fs}	Forward Tranconductance	V_{GS} = 15 V, I_D = 20 A		20		S
V_{SD}	Diode Forward Voltage	I_S = 15 A , V_{GS} = 0 V		0.84		V

Dynamic						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
Q_g	Total Gate Charge	V_{DS} = 15 V , I_D = 20 A, V_{GS} = 4.5 V	--	20	--	nC
Q_{gs}	Gate-Source Charge		--	7.3	--	nC
Q_{gd}	Gate-Drain Charge		--	11	--	nC
$t_{d(on)}$	Turn-On Delay Time	I_D = 20 A , R_L = 0.8 Ω, V_{GEN} = 10 V , R_{GEN} = 6 Ω V_{DS} = 15 V	--	10	--	ns
t_r	Rise Time		--	13	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	51	--	ns
tf	Fall Time		--	21	--	ns
C_{ISS}	Input Capacitance	V_{DS} = 15 V f = 1 MHz ,V_{GS} = 0 V	--	1785	--	pF
C_{OSS}	Output Capacitance		--	323	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	285	--	pF

Notes

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

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

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P-Channel 30-V (D-S) MOSFET

■Typical Electrical Characteristics

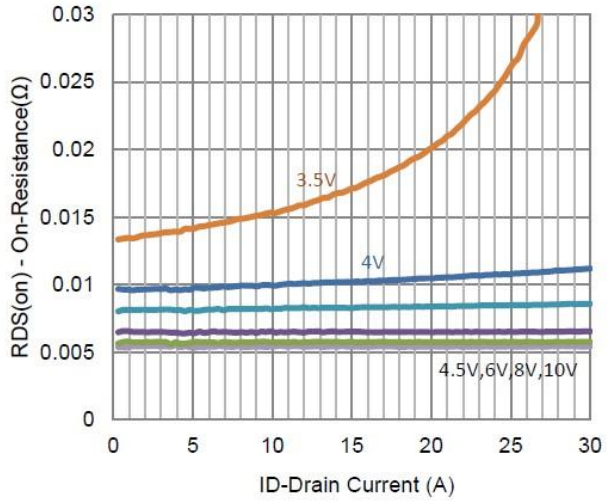


FIG.1-ON REGION CHARACTERISTICS

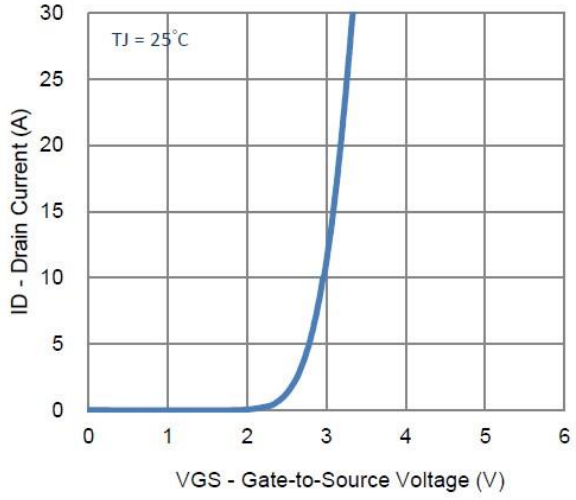


FIG.2-TRANSFER CHARACTERISTICS

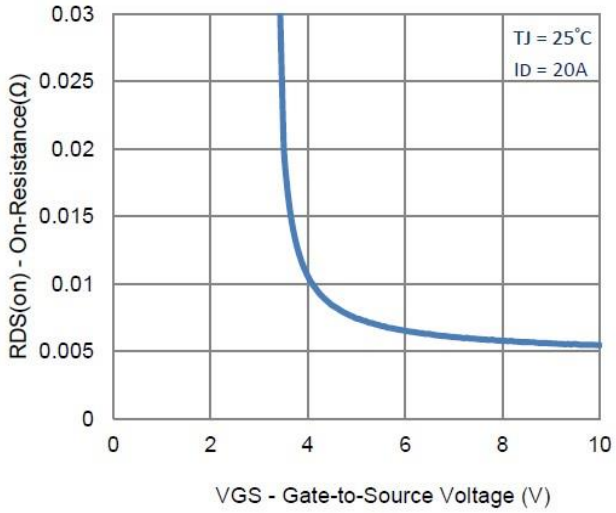


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

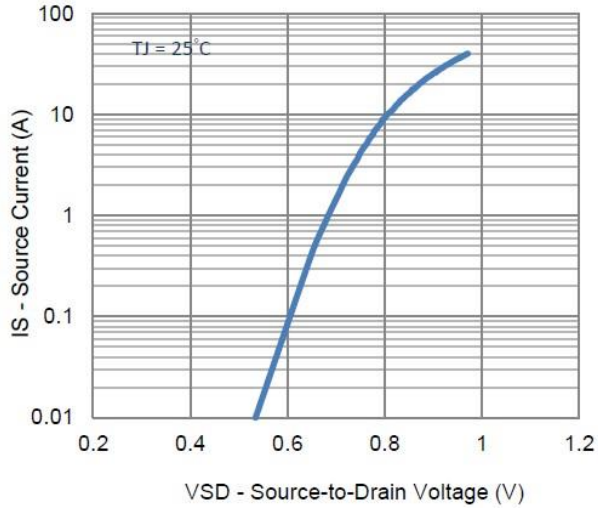


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

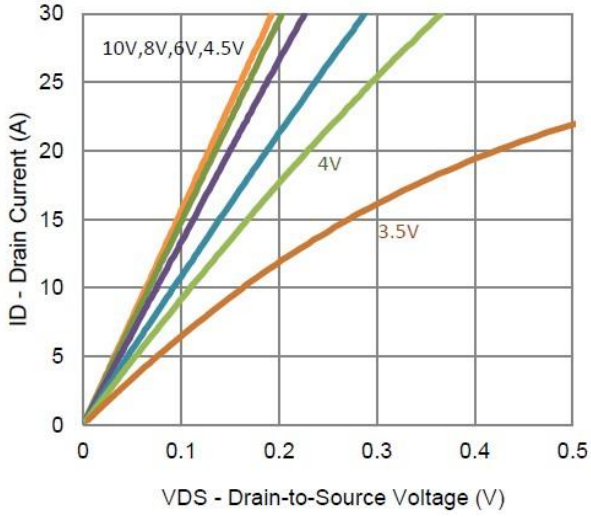


FIG.5-CAPACITANCE CHARACTERISTICS

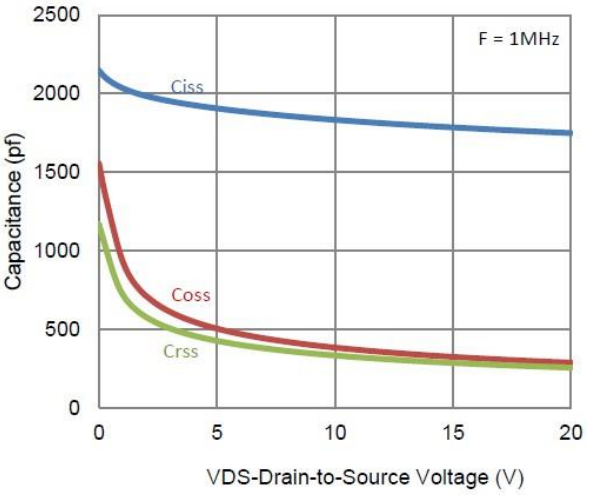


FIG.6-GATE CHARGE CHARACTERISTICS

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P-Channel 30-V (D-S) MOSFET

■Typical Electrical Characteristics

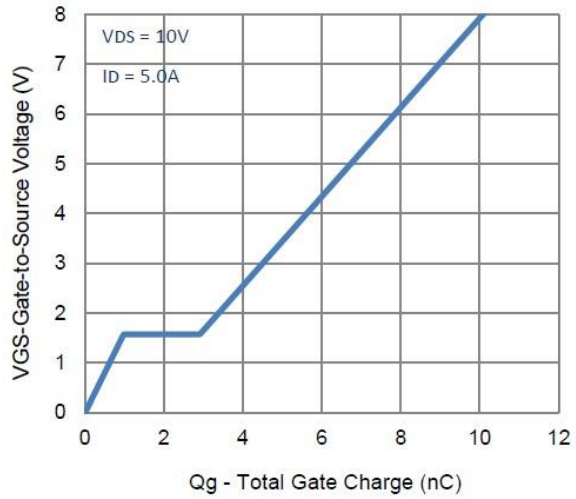


FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

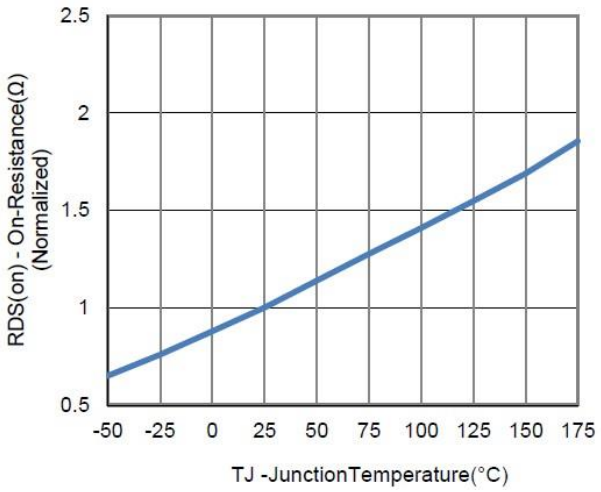


FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

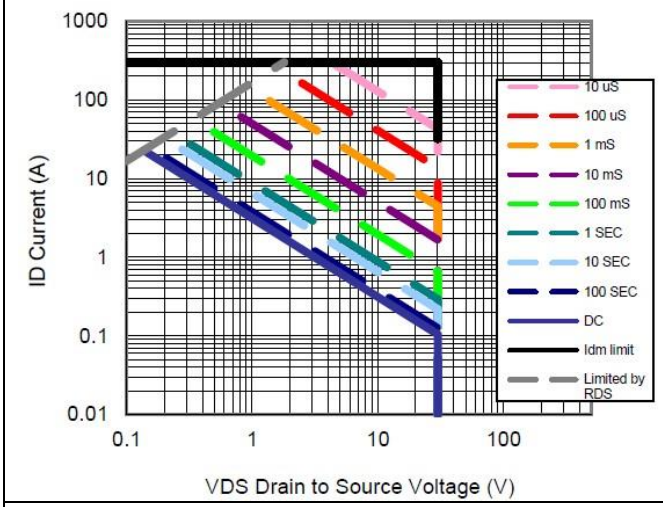


FIG.9-MAXIMUM SAFE OPERATING AREA

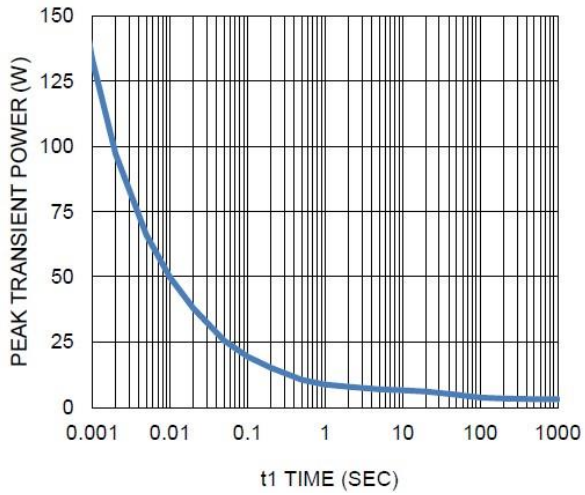


FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

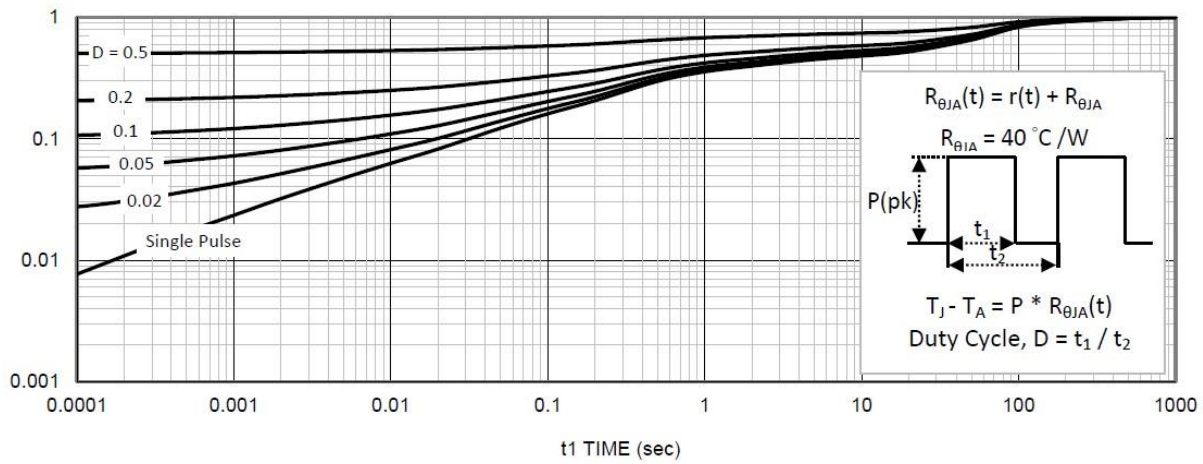


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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P-Channel 30-V (D-S) MOSFET

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