

MS48P25

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, and PCMCIA cards, cellular and cordless telephones.

Features

- Low rDS(on) provides higher efficiency and extends battery life
- Low thermal impedance copper lead frame SO-8 saves board space
- Fast switching speed
- RoHS compliant package

Package type : SO-8

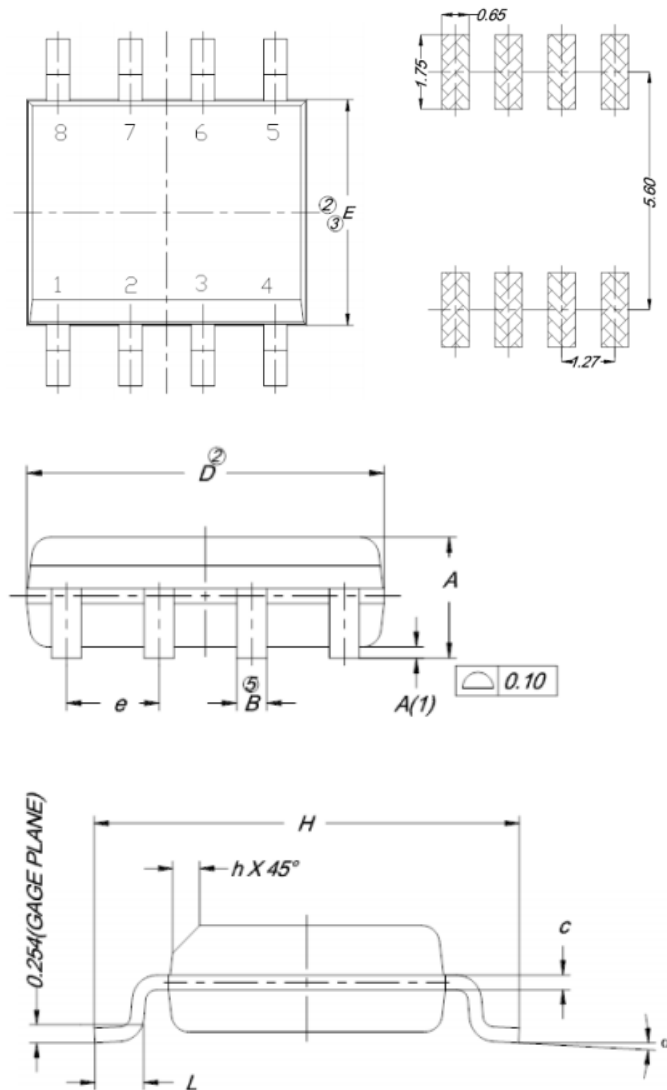
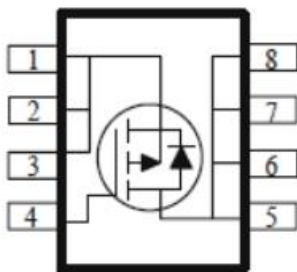
Packing & Order Information

3,000/Reel



**RoHS
COMPLIANT**

Graphic symbol



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.35	1.55	1.75
A(1)	0.10	0.18	0.25
B	0.38	0.45	0.51
C	0.19	0.22	0.25
D	4.80	4.90	5.00
E	3.80	3.90	4.00
e	1.27 BSC		
H	5.80	6.00	6.20
L	0.50	0.72	0.93
α	0°	4°	8°
h	0.25	0.38	0.50

MS48P25

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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	-30	V
V_{GS}	Gate-Source Voltage	± 25	V
I_D	Continuous Drain Current ^a ($T_A=25^\circ\text{C}$)	-11.5	A
	Continuous Drain Current ^a ($T_A=70^\circ\text{C}$)	-9.3	A
I_{DM}	Pulsed Drain Current ^b	-50	A
I_S	Continuous Source Current (Diode Conduction) ^a	± 4.3	A
P_D	Power Dissipation ^a ($T_A=25^\circ\text{C}$)	3.1	W
	Power Dissipation ^a ($T_A=70^\circ\text{C}$)	2.2	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$

Thermal characteristics ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient C/W ^a ($t \leq 10$ sec)	40	$^\circ\text{C/W}$
	Maximum Junction-to-Ambient C/W ^a (Steady-State)	80	

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
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-1.0			V
I_{GSS}	Gate-Body Leakage	$V_{DS} = 0\text{ V}, V_{GS} = \pm 25\text{ V}$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}$ $V_{DS} = -24\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			-1 -25	μA
$I_{D(on)}$	On-State Drain Current	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	-5.75			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{DS} = 10\text{ V}, I_D = -9.2\text{ A}$ $V_{DS} = -4.5\text{ V}, I_D = -7.5\text{ A}$			13 19	m Ω
g_{fs}	Forward Transconductance	$V_{GS} = -15\text{ V}, I_D = -9.2\text{ A}$		40		S
V_{SD}	Diode Forward Voltage	$I_S = -2.2\text{ A}, V_{GS} = 0\text{ V}$		-0.7		V

Dynamic

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	$V_{DS} = -15\text{ V}, I_D = -9.2\text{ A},$ $V_{GS} = -4.5\text{ V}$	--	42	--	nC
Q_{gs}	Gate-Source Charge		--	13	--	nC
Q_{gd}	Gate-Drain Charge		--	20	--	nC

MS48P25

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Dynamic						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Delay Time	$I_D = -9.2 \text{ A}$, $R_L = 1.7 \text{ } \Omega$, $V_{GEN} = -10 \text{ V}$, $R_{GEN} = 6 \text{ } \Omega$ $V_{DS} = -15 \text{ V}$	--	9	--	ns
t_r	Rise Time		--	48	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	104	--	ns
t_f	Fall Time		--	59	--	ns
C_{ISS}	Input Capacitance	$V_{DS} = -15 \text{ V}$ $f = 1 \text{ MHz}$, $V_{GS} = 0 \text{ V}$	--	2380	--	pF
C_{OSS}	Output Capacitance		--	369	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	350	--	pF

Notes

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

MS48P25

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Typical Electrical Characteristics

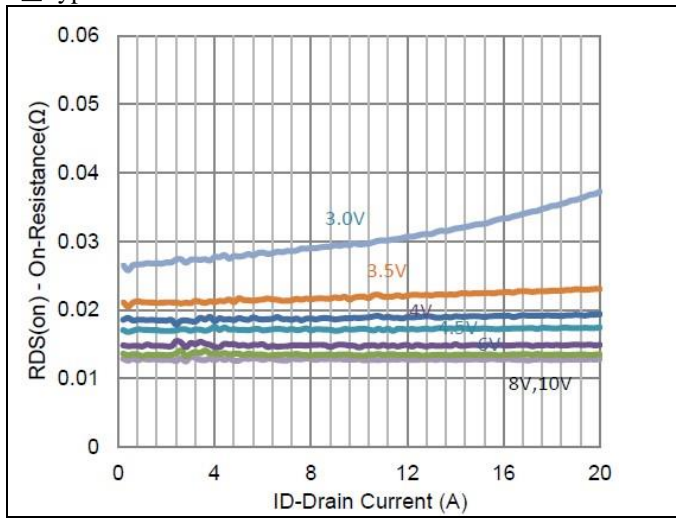


FIG.1-ON REGION CHARACTERISTICS

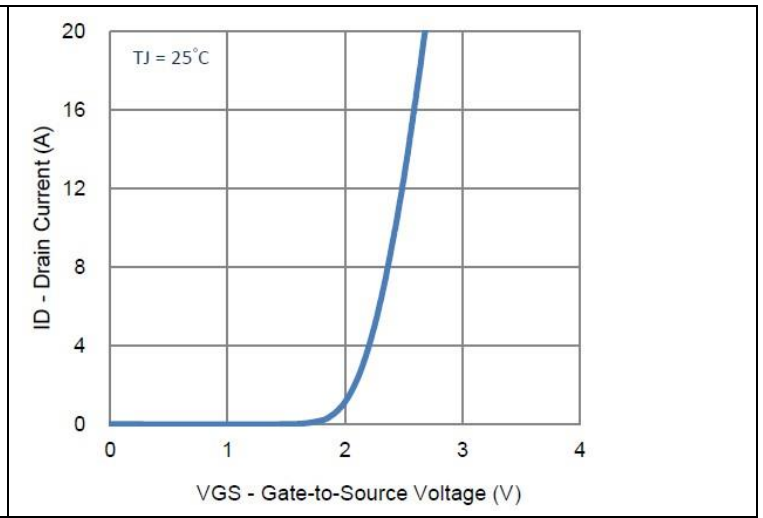


FIG.2-TRANSFER CHARACTERISTICS

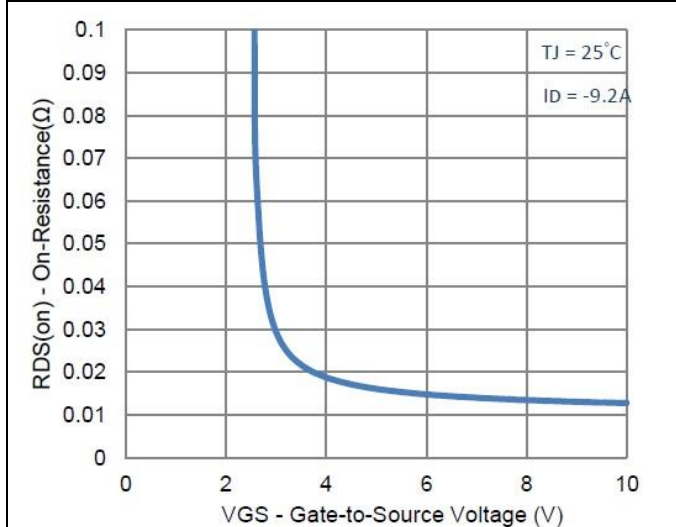


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

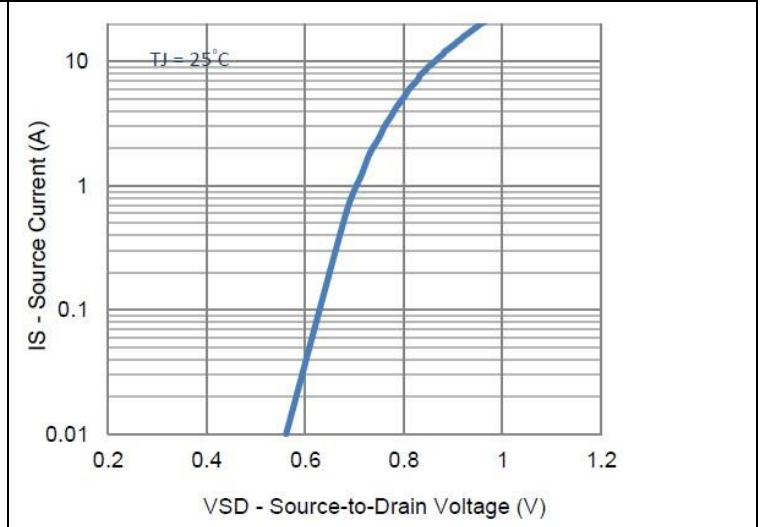


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

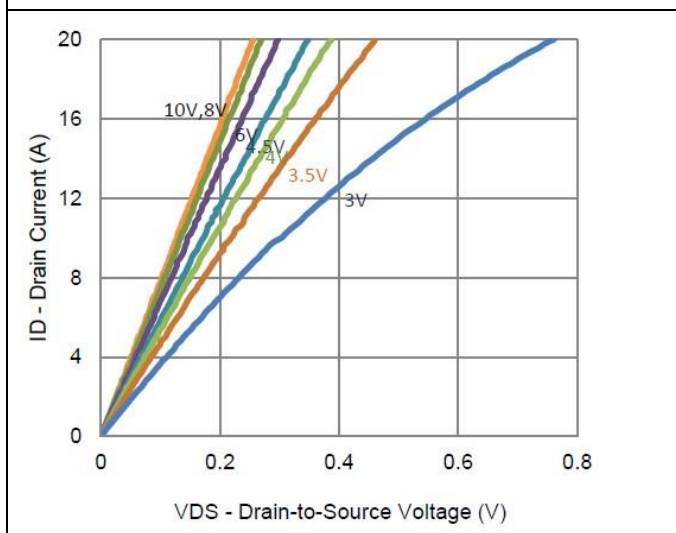


FIG.5-CAPACITANCE CHARACTERISTICS

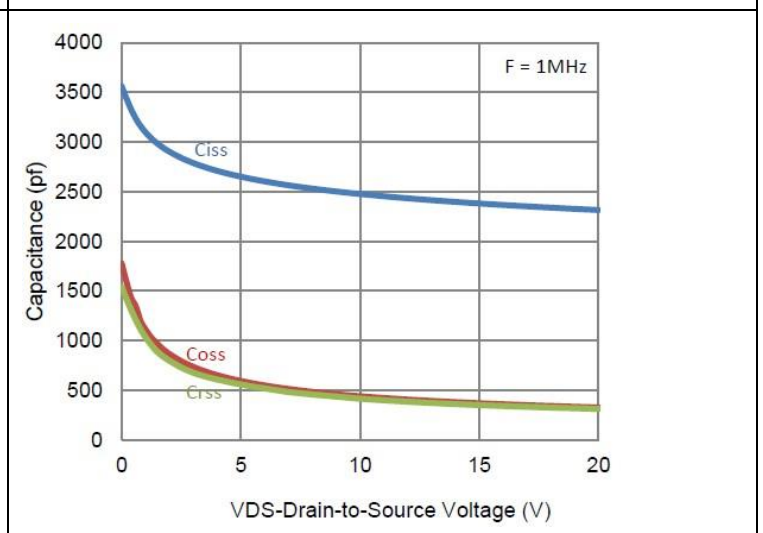


FIG.6-GATE CHARGE CHARACTERISTICS

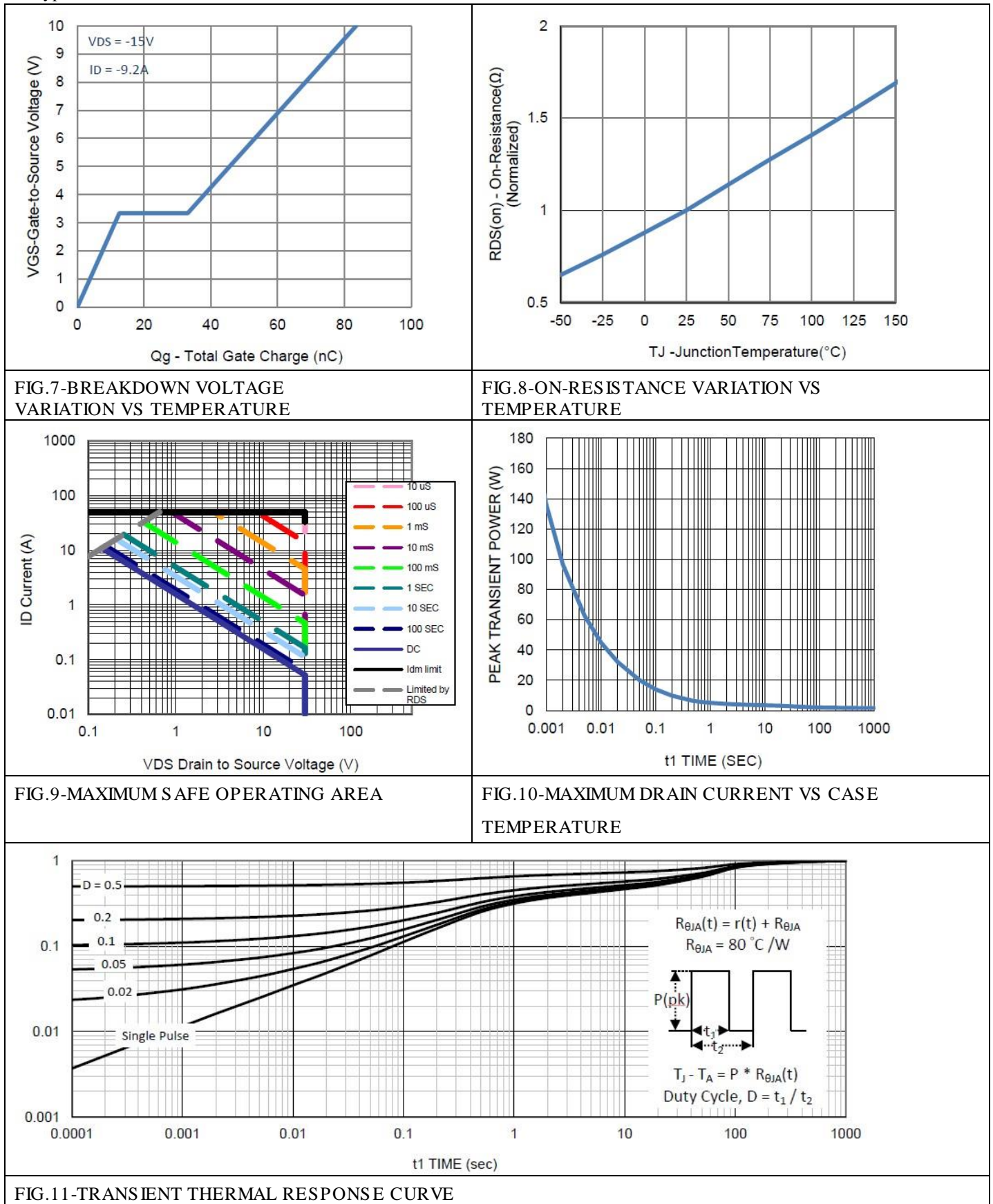
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