

## MS49P63

### P-Channel 60-V (D-S) MOSFET

#### Description

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $R_{DS(on)}$  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  $r_{DS(on)}$  trench technology
- Low thermal impedance
- Low thermal impedance copper lead frame SO-8 saves board space
- Fast switching speed
- RoHS compliant package

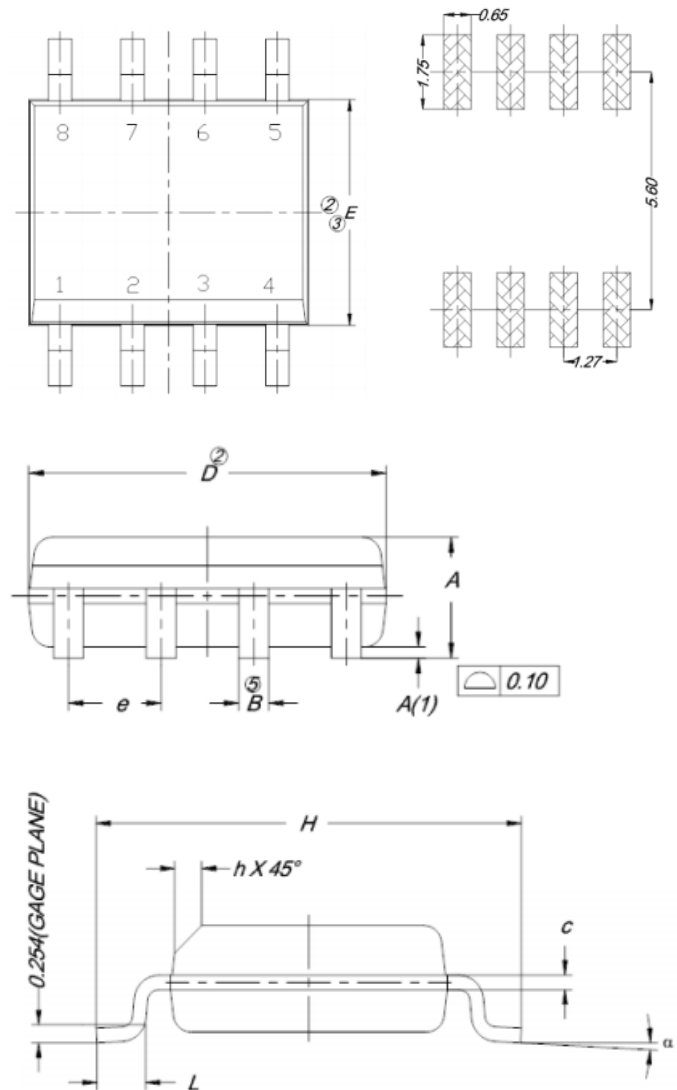
#### Typical Applications

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

**Package type :** SO-8

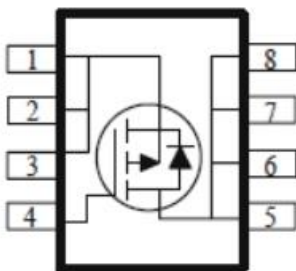
#### Packing & Order Information

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
$\alpha$	0°	4°	8°
h	0.25	0.38	0.50

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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	$\pm 20$	V
$I_D$	Continuous Drain Current <sup>a</sup> ( $T_A=25^{\circ}\text{C}$ )	-3.5	A
	Continuous Drain Current <sup>a</sup> ( $T_A=70^{\circ}\text{C}$ )	-2.7	A
$I_{DM}$	Pulsed Drain Current <sup>b</sup>	-15	A
$I_S$	Continuous Source Current (Diode Conduction) <sup>a</sup>	-2.4	A
$P_D$	Power Dissipation <sup>a</sup> ( $T_A=25^{\circ}\text{C}$ )	2.1	W
	Power Dissipation <sup>a</sup> ( $T_A=70^{\circ}\text{C}$ )	1.3	W
$T_J/T_{STG}$	Operating Junction and Storage Temperature	-55 to +150	$^{\circ}\text{C}$

##### Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient $C/W^a$ ( $t \leq 10$ sec)	62.5	$^{\circ}\text{C/W}$
	Maximum Junction-to-Ambient $C/W^a$ (Steady-State)	110	

##### 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	$V_{DS} = 0$ V, $V_{GS} = \pm 20$ V			$\pm 100$	nA
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -48$ V, $V_{GS} = 0$ V $V_{DS} = -48$ V, $V_{GS} = 0$ V, $T_J = 55^{\circ}\text{C}$			-1 -25	$\mu\text{A}$
$I_{D(on)}$	On-State Drain Current	$V_{DS} = -5$ V, $V_{GS} = -10$ V	-5			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{DS} = -10$ V, $I_D = -2.8$ A $V_{DS} = -4.5$ V, $I_D = -2.3$ A			120 180	m $\Omega$
$g_{fs}$	Forward Transconductance	$V_{GS} = -15$ V, $I_D = -2.8$ A		10		S
$V_{SD}$	Diode Forward Voltage	$I_S = -1.2$ A, $V_{GS} = 0$ V		-0.87		V

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Dynamic <sup>b</sup>						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$Q_g$	Total Gate Charge	$V_{DS} = -30\text{ V}$ , $I_D = -2.8\text{ A}$ , $V_{GS} = -4.5\text{ V}$	--	5	--	nC
$Q_{gs}$	Gate-Source Charge		--	1.7	--	nC
$Q_{gd}$	Gate-Drain Charge		--	2.0	--	nC
$t_{d(on)}$	Turn-On Delay Time	$I_D = -2.8\text{ A}$ , $R_L = 10.8\ \Omega$ , $V_{GEN} = -10\text{ V}$ , $R_{GEN} = 6\ \Omega$ , $V_{DS} = -30\text{ V}$	--	5	--	ns
$t_r$	Rise Time		--	5	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	18	--	ns
$t_f$	Fall Time		--	6	--	ns
$C_{ISS}$	Input Capacitance	$V_{DS} = -15\text{ V}$ $f = 1\text{ MHz}$ , $V_{GS} = 0\text{ V}$	--	385	--	pF
$C_{OSS}$	Output Capacitance		--	40	--	pF
$C_{RSS}$	Reverse Transfer Capacitance		--	28	--	pF

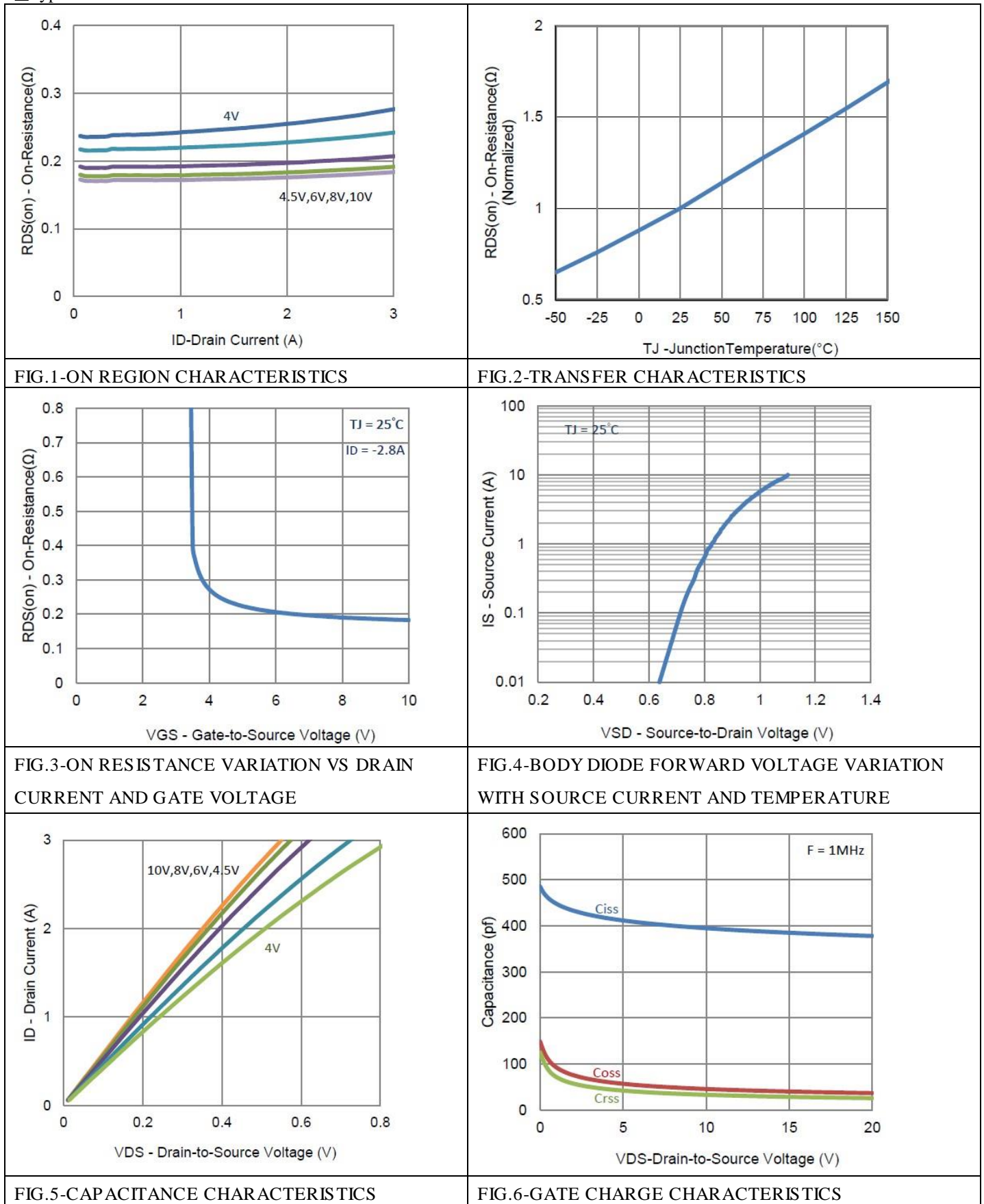
#### Notes

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

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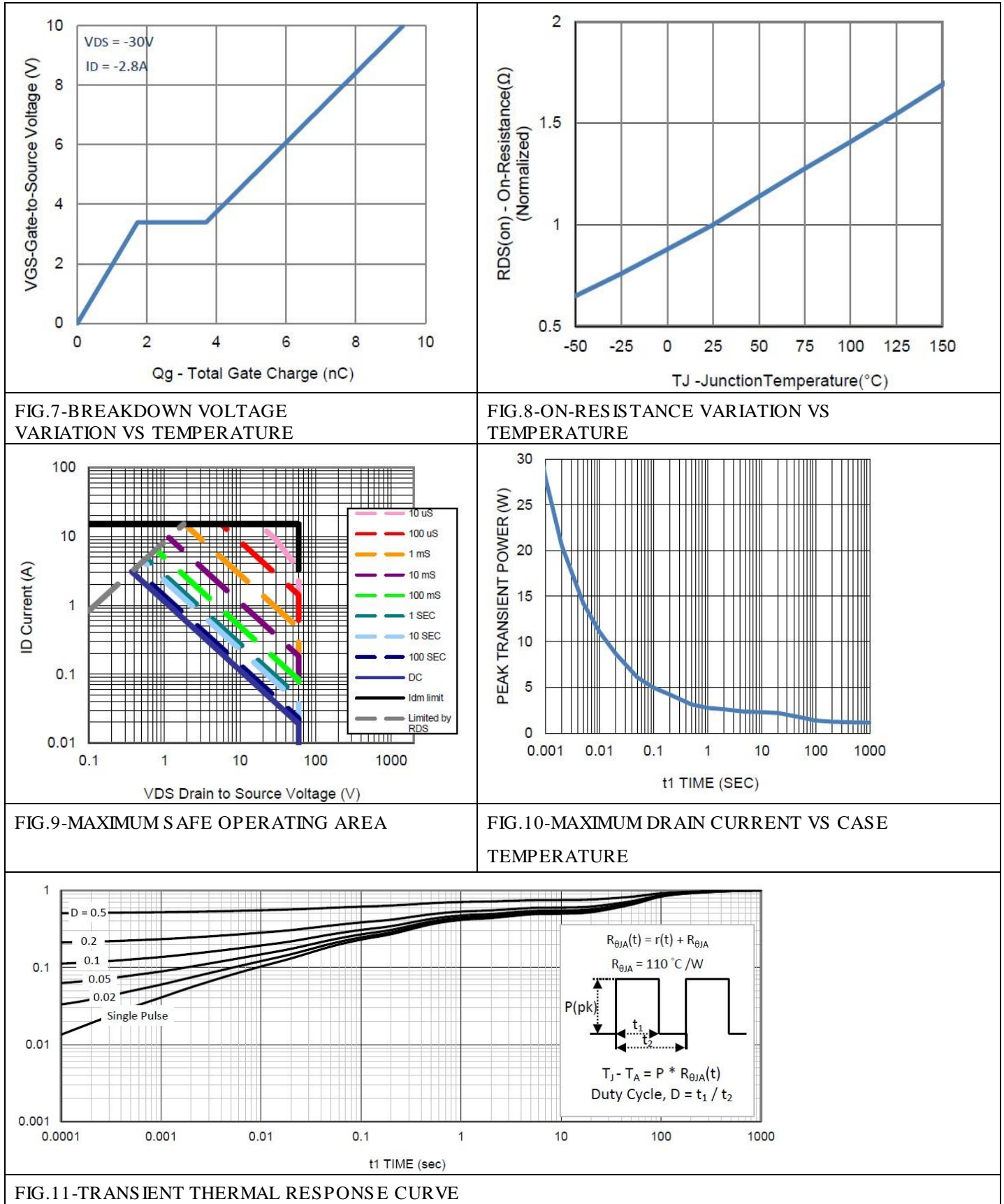
#### Typical Electrical Characteristics



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#### Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

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