MS23P25

P-Channel 20-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.

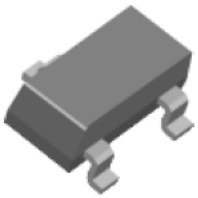
Features

- Low rDS(on) provides higher efficiency and extends battery life
- Low thermal impedance copper lead frame SOT-23 saves board space
- Fast switching speed
- High performance trench technology
- RoHS compliant package

Package type：SOT-23

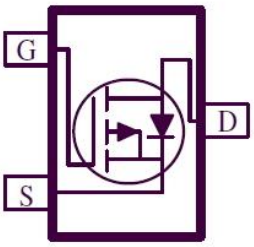
Packing & Order Information

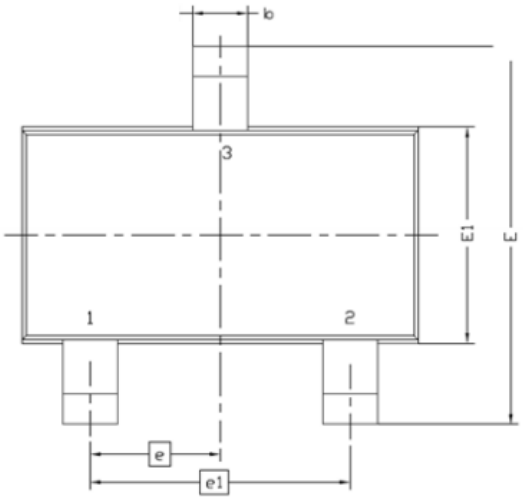
3,000/Reel

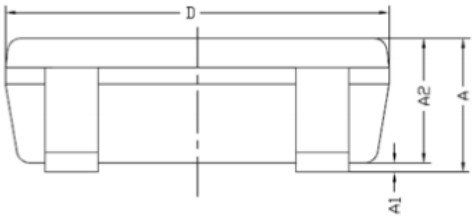


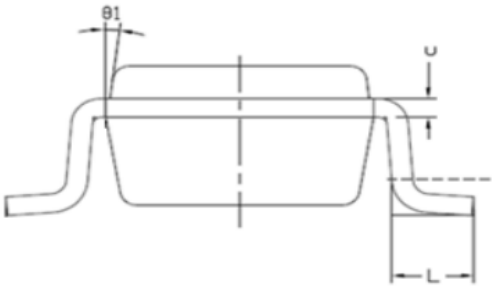
RoHS
COMPLIANT

Graphic symbol









Symbol	MILLIMETERS	
	MIN	MAX
A	0.8	1.2
A1	0	0.1
A2	0.7	1.1
b	0.3	0.5
c	0.1	0.2
D	2.7	3.1
E	2.6	3
E1	1.4	1.8
e	0.95 BSC	
e1	1.9 BSC	
L	0.3	0.6
θ1	7° NOM	

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current @ T_C=25°C	-3.6	A
I_{DM}	Pulsed Drain Current	-10	A
I_S	Continuous Source Current (Diode Conduction)	0.46	A
P_D	Power Dissipation (T_C =25°C)	1.25	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

NOTE: Repetitive rating; pulse width limited by maximum junction temperature.

Thermal characteristics (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient	100	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case	106	

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-0.7			V
I_{GSS}	Gate-Body Leakage	V_{DS} =0 V , V_{GS} = ±8 V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 16 V , V_{GS} = 0 V V_{DS} = -16 V , V_{GS} = 0 V , T_J= 55°C			-1 -10	uA
$I_{D(on)}$	On-State Drain Current[A]	V_{DS} = -5 V, V_{GS} = -4.5 V	-10			A
$r_{DS(on)}$	Drain-Source On-Resistance[A]	V_{DS} = -4.5 V, I_D = -3.6 A V_{DS} = -2.5 V, I_D = -2.8 A V_{DS} = -1.8 V, I_D = -1.8 A			55 89 200	mΩ
g_{fs}	Forward Tranconductance[A]	V_{GS} = -5 V, I_D = -3.6 A		12		S
V_{SD}	Diode Forward Voltage	I_S = -0.46 V, V_{GS} = 0 V		-0.60		V

Dynamic[b]

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = -5 V , I_D = -3.6 A, V_{GS} = -4.5 V		16.7		nC
Q_{gs}	Gate-Source Charge			1.8		nC
Q_{gd}	Gate-Drain Charge			1.9		nC
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = -10 V , R_G = 6 Ω, V_{GEN} = 4.5 V , I_L = -1 A		9		ns
t_r	Rise Time			4		ns
$t_{d(off)}$	Turn-Off Delay Time			25		ns
t_f	Fall Time			20		ns

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Notes:

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

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

c. Repetitive rating, pulse width limited by junction temperature.

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■Typical Electrical Characteristics

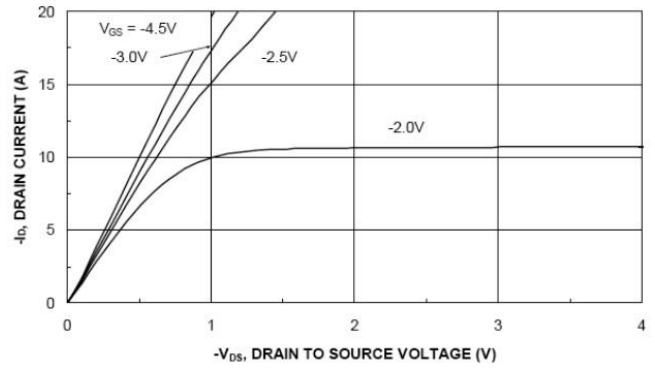

FIG.1-OUTPUT CHARACTERISTICS

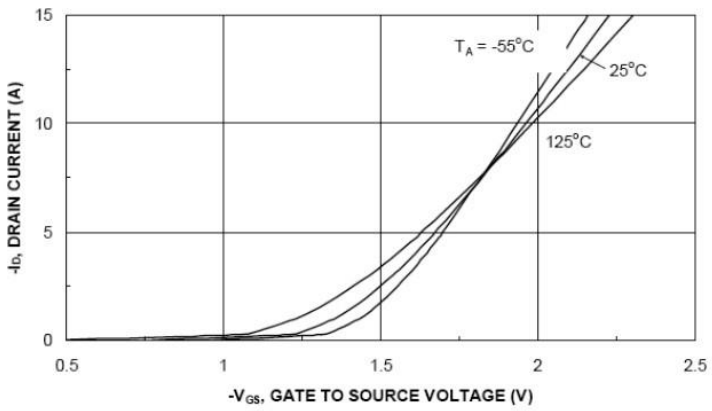

FIG.2-TRANSFER CHARACTERISTICS

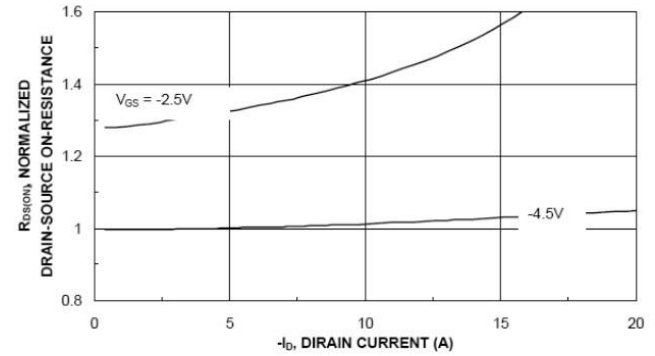

FIG.3-ON-RESISTANCE VS DRAIN CURRENT

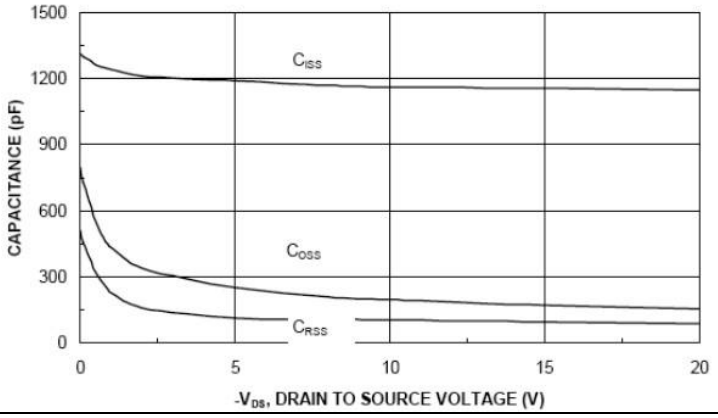

FIG.4-CAPACITANCE

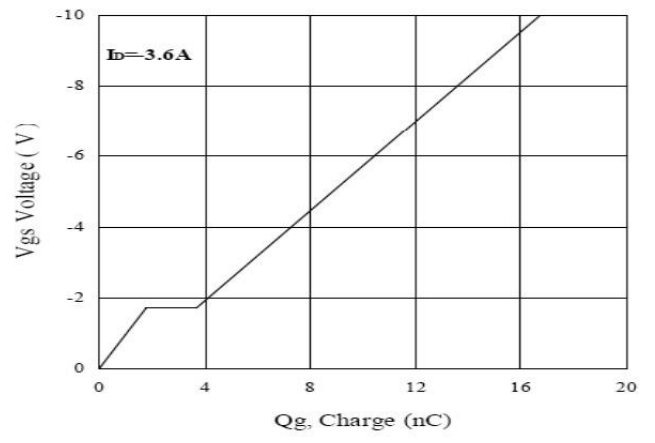

FIG.5-GATE CHARGE

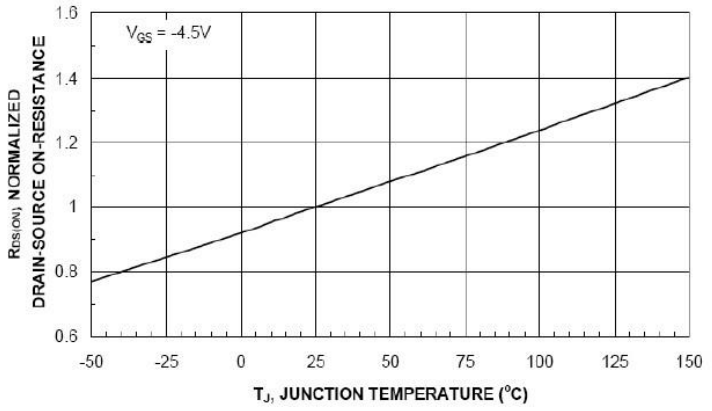

FIG.6-ON-RESTISTANCE VS. JUNCTION TEMPERATURE

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