MS23N36

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.

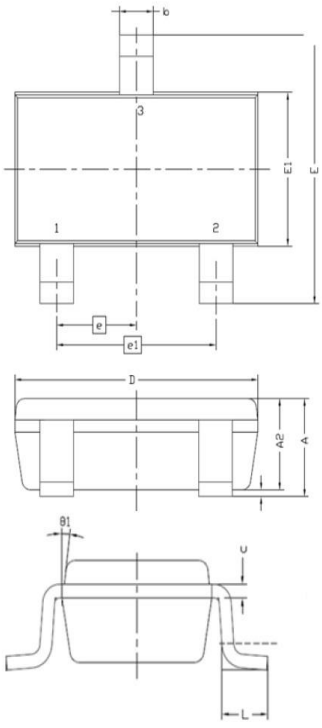
Features

- Low rDS(on) provides higher efficiency and extends battery life
- Miniature SOT-23 Surface Mount Package
- Saves Board Space
- RoHS compliant package

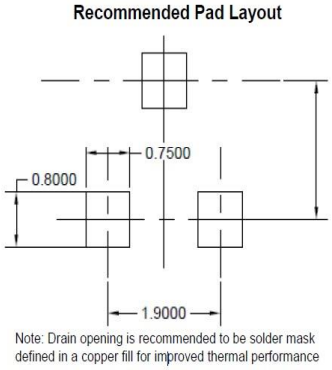
Package type：SOT-23

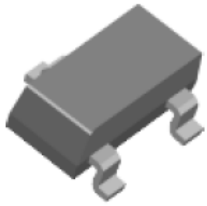
Packing & Order Information

3,000/Reel



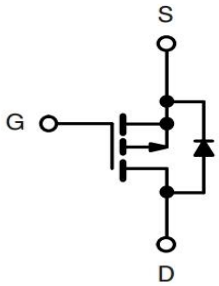
Symbol	MILLIMETERS	
	MIN	MAX
A	0.8	1.2
A1	0	0.1
A2	0.7	1.1
b	0.3	0.5
c	0.1	0.2
D	2.7	3.1
E	2.6	3
E1	1.4	1.8
e	0.95 BSC	
e1	1.9 BSC	
L	0.3	0.6
θ1	7° NOM	





RoHS COMPLIANT

Graphic symbol



Absolute Maximum Ratings (Tc=25°C unless otherwise specified)			
Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current[a] (T_A= 25°C)	5.2	A
	Continuous Drain Current[a] (T_A =70°C)	4.1	A
I_{DM}	Pulsed Drain Current[b]	30	A
I_S	Continuous Source Current (Diode Conduction)[a]	1.6	A
P_D	Power Dissipation[a] (T_A =25°C)	1.3	W
	Power Dissipation[a] (T_A =70°C)	0.8	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

• Drain current limited by maximum junction temperature

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Thermal Resistance Ratings			
Symbol	Parameter	Maximum	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient[a] (t <= 5 sec)	100	°C/W
	Maximum Junction-to-Ambient[a] (Steady-State)	166	

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-Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	0.6			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} = 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[A]	V_{DS} = 5 V, V_{GS} = 4.5 V	20			A
$R_{DS(on)}$	Drain-Source On-Resistance[A]	V_{GS} = 4.5 V, I_D = 5.2 A V_{GS} = 2.5 V, I_D = 3.7 A			32 64	mΩ
g_{fs}	Forward Tranconductance[A]	V_{DS} = 15 V, I_D = 5.2 A		40		S
V_{SD}	Diode Forward Voltage	I_S = 2.3 V, V_{GS} = 0 V		0.7		V

Dynamic[b]						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = 15 V , I_D = 4.5 A, V_{GS} = 5.2 V		6.0		nC
Q_{gs}	Gate-Source Charge			1.0		nC
Q_{gd}	Gate-Drain Charge			1.5		nC
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 25 V , R_L = 25 Ω, V_{GEN} = 10 V , I_D = 1 A		7.8		ns
t_r	Rise Time			5.2		ns
$t_{d(off)}$	Turn-Off Delay Time			31.2		ns
tf	Fall Time			8		ns

Notes:

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

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

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■Characteristic Curves

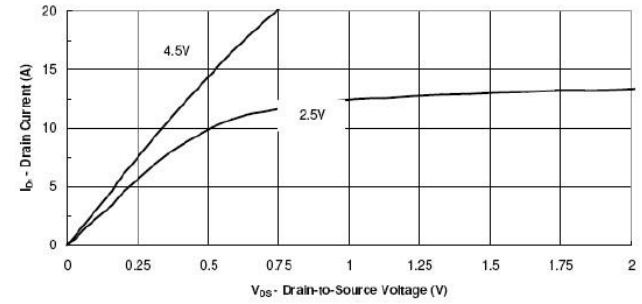

FIG.1-OUTPUT CHARACTERISTICS

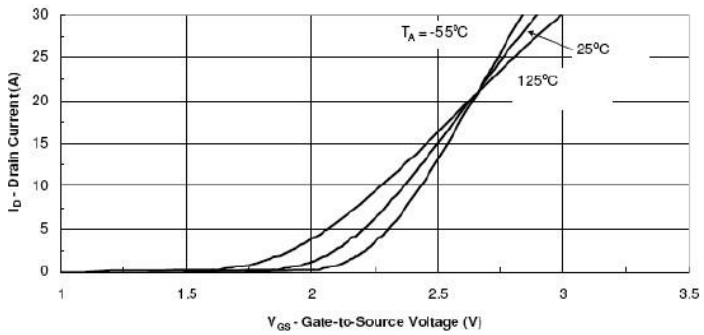

FIG.2-TRANSFER CHARCTERISTICS

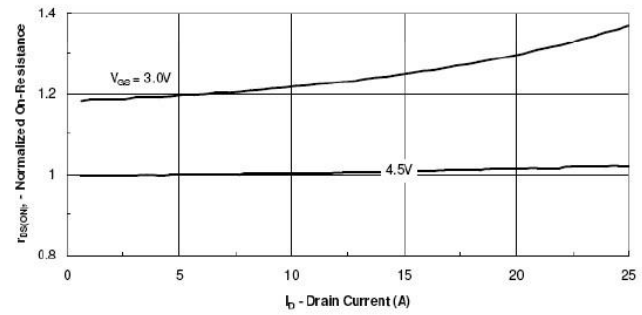

FIG.3-ON-RESISTANCE VS DARIN CURRENT

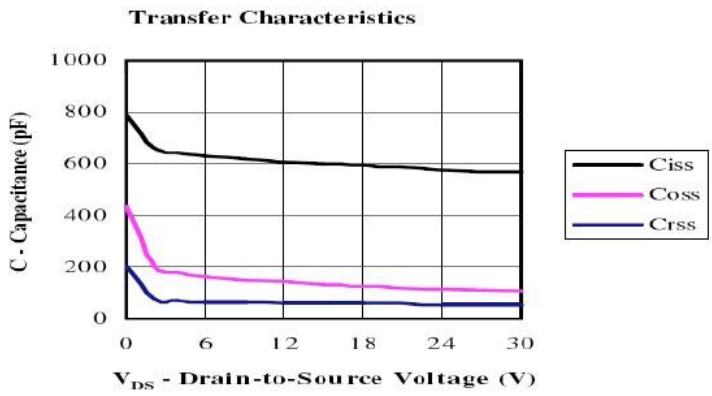

FIG.4-CAPACITANCE

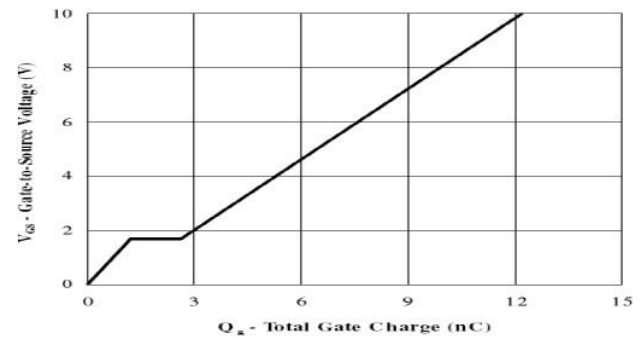

FIG.5-GATE CHARGE

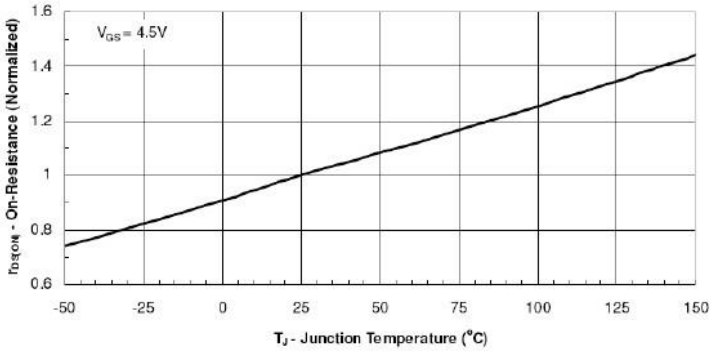

FIG.6-ON-RESISTANCE VS. JUNCTION TEMPERATURE

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■Characteristic Curves

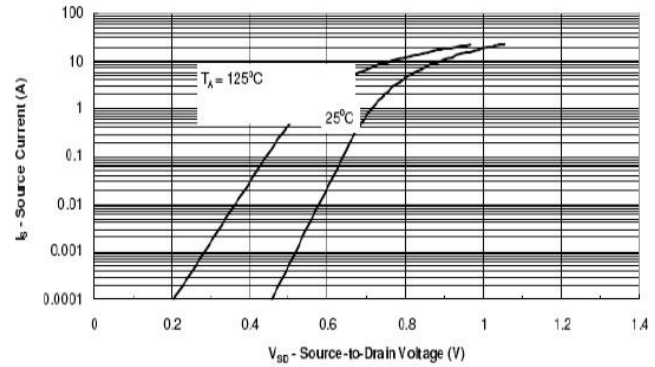

FIG.7-SOURCE-DRAIN DIODE FORWARD VOLTAGE

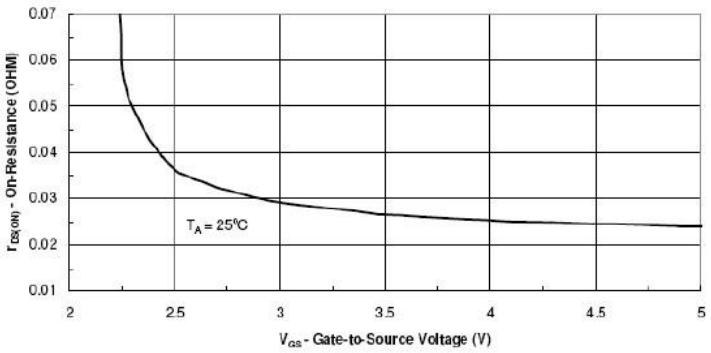

FIG.8-ON-RESISTANCE VS. GATE-TO SOURCE VOLTAGE

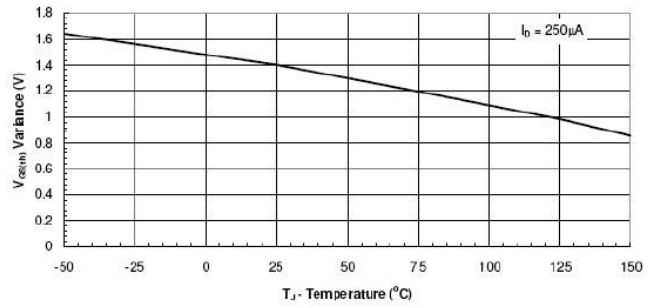

FIG.9-THRESHOLD VOLTAGE

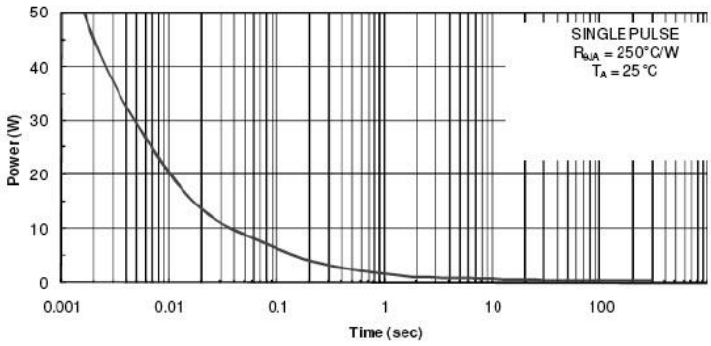

FIG.10-SINGLE PULSE POWER

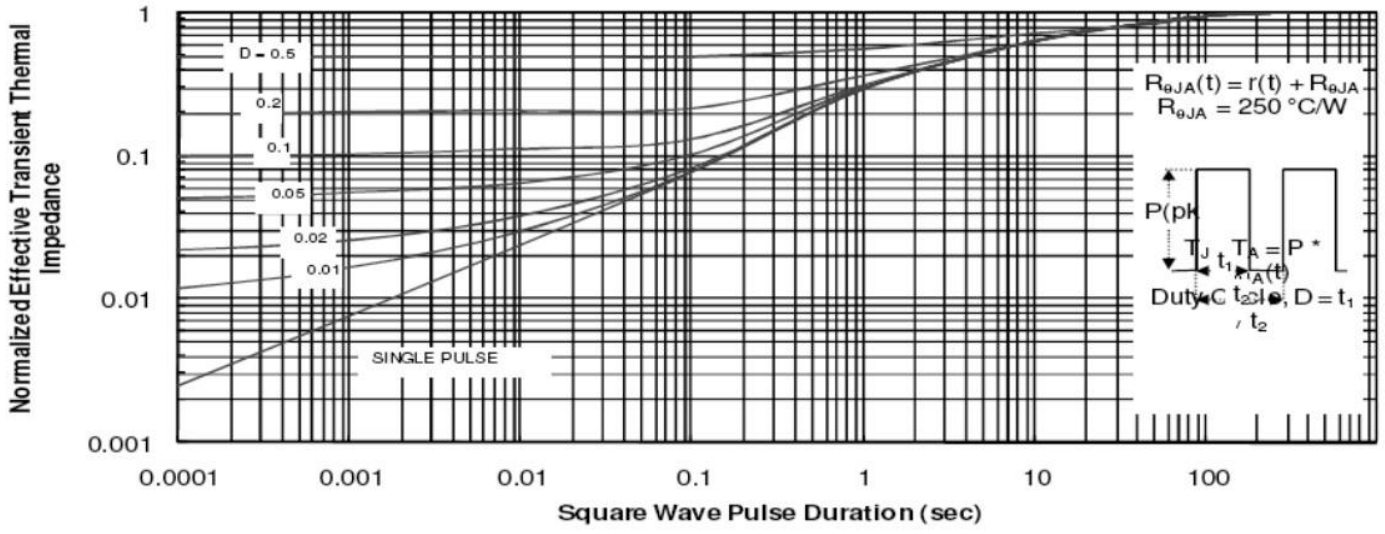

FIG.11-NORMALIZED THERSIENT IMPEDANCE, JUNCTION-TO-AMBIENT

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