

MS23N26

P-Channel 20-V (D-S) MOSFET

Description

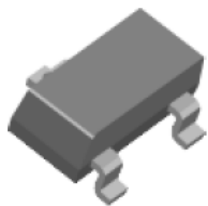
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA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

Features

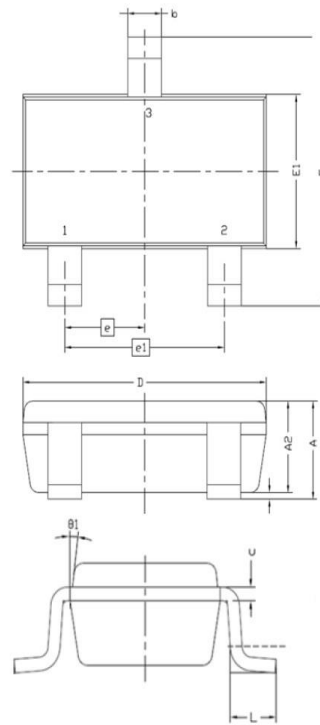
- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Miniature SOT-23 Surface Mount Package
- Saves Board Space
- RoHS compliant package

Packing & Order Information

3,000/Reel

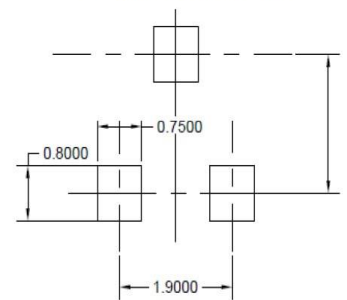


**RoHS
COMPLIANT**



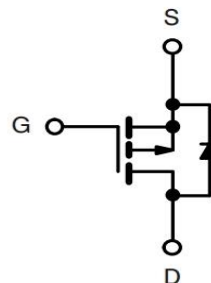
Symbol	MILLIMETERS	
	MIN	MAX
A	0.8	1.2
A1	0	0.1
A2	0.7	1.1
b	0.3	0.5
c	0.1	0.2
D	2.7	3.1
E	2.6	3
E1	1.4	1.8
e	0.95 BSC	
e1	1.9 BSC	
L	0.3	0.6
θ1	7° NOM	

Recommended Pad Layout



Note: Drain opening is recommended to be solder mask defined in a copper fill for improved thermal performance

Graphic symbol



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	± 20	V
I_D	Continuous Drain Current ^a ($T_A=25^\circ\text{C}$)	6.4	A
	Continuous Drain Current _a ($T_A=70^\circ\text{C}$)	5	A
I_{DM}	Pulsed Drain Current ^b	20	A
I_S	Continuous Source Current (Diode Conduction) ^a	2.6	A
P_D	Power Dissipation ^a ($T_A=25^\circ\text{C}$)	2.1	W
	Power Dissipation ^a ($T_A=70^\circ\text{C}$)	1..	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	$^\circ\text{C}$

- Drain current limited by maximum junction temperature

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Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
R _{θJA}	Maximum Junction-to-Ambient ^a (t ≤ 10 sec)	62.5	°C/W
	Maximum Junction-to-Ambient ^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-Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	1			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 10	μA
I _{D(on)}	On-State Drain Current ^A	V _{DS} = 5 V, V _{GS} = 10 V	20			A
I _{DS(on)}	Drain-Source On-Resistance ^A	V _{GS} = 10 V, I _D = 5.0 A V _{GS} = 4.5 V, I _D = 4.4 A			34 41	mΩ
g _{fs}	Forward Transconductance ^A	V _{DS} = 15 V, I _D = 5.0 A		20		S
V _{SD}	Diode Forward Voltage	I _S = 1.36 V, V _{GS} = 0 V		0.77		V

Dynamic^b

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q _g	Total Gate Charge	V _{DS} = 15 V, I _D = 5 A, V _{GS} = 4.5 V		3.8		nC
Q _{gs}	Gate-Source Charge			1.3		nC
Q _{gd}	Gate-Drain Charge			2.0		nC
C _{iSS}	Input Capacitance	V _{DS} = 15 V, V _{GS} = 0 V f = 1MHz		327		nC
C _{oSS}	Output Capacitance			65		nC
C _{rSS}	Reverse Transfer Capacitance			49		nC
t _{d(on)}	Turn-On Delay Time	V _{DD} = 15 V, R _L = 3 Ω, V _{GEN} = 4.5 V, R _{GEN} = 6 Ω I _D = 5.0 A		1.9		ns
t _r	Rise Time			4		ns
t _{d(off)}	Turn-Off Delay Time			13		ns
t _f	Fall Time			6		ns

Notes:

- Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

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Typical Electrical Characteristics

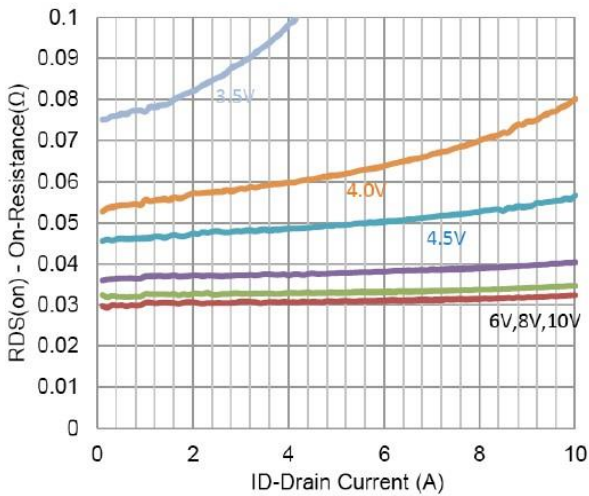


FIG.1-ON RESISTANCE VS DRAIN CURRENT

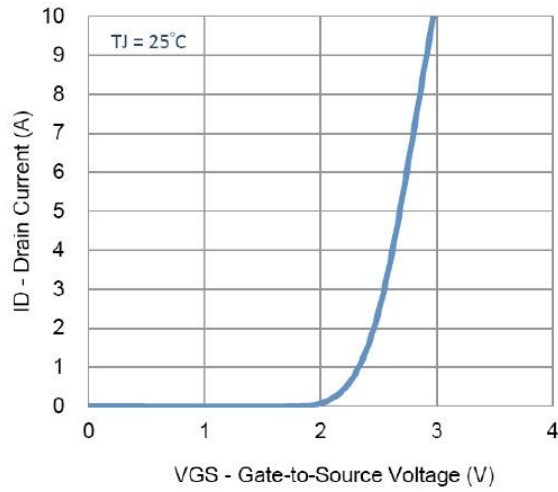


FIG.2-TRANSFER CHARACTERISTICS

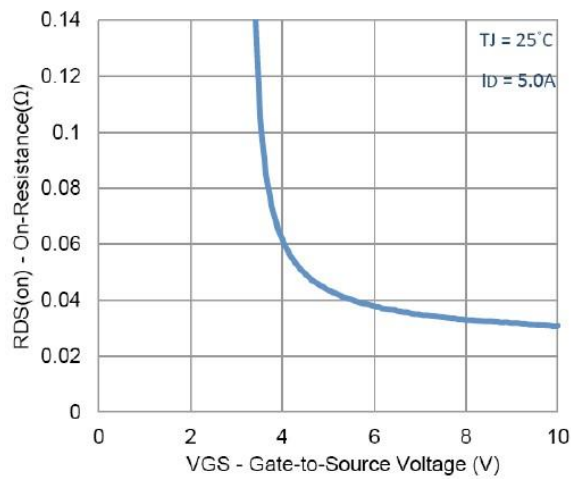


FIG.3-ON-RESISTANCE VS GATE-TO-SOURCE VOLTAGE

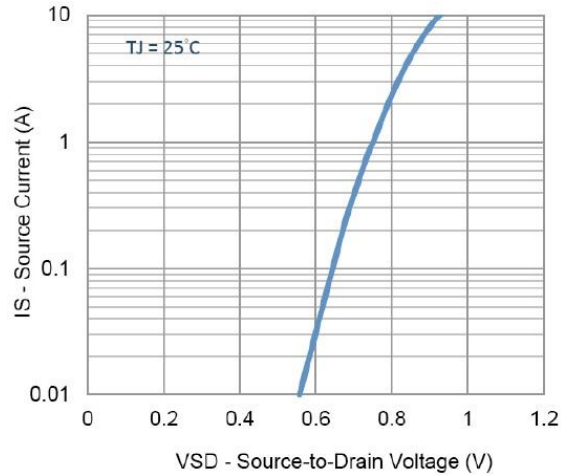


FIG.4-DRAIN-TO-SOURCE FORWARD VOLTAGE

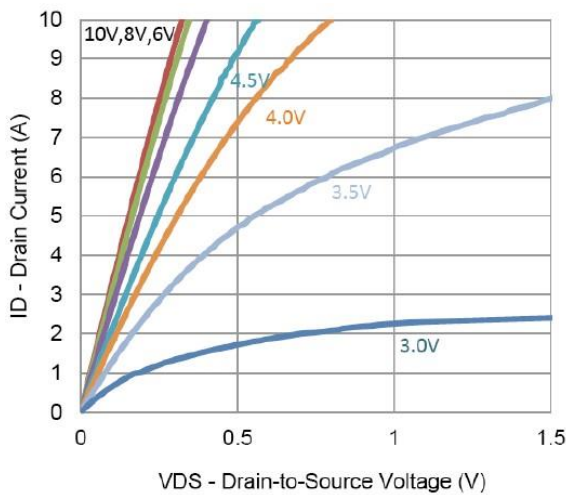


FIG.5-OUTPUT CHARACTERISTICS

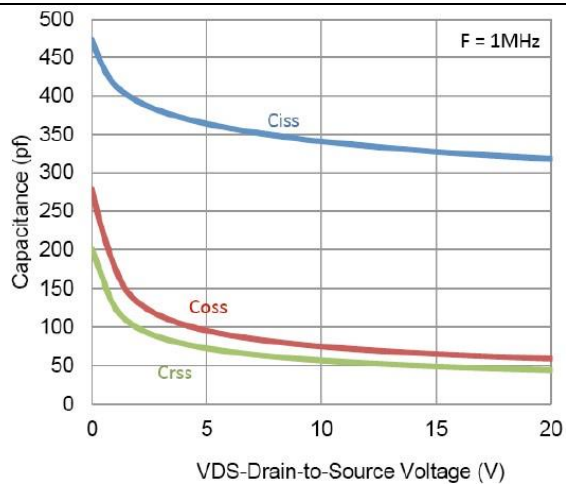


FIG.6-CAPITANCE

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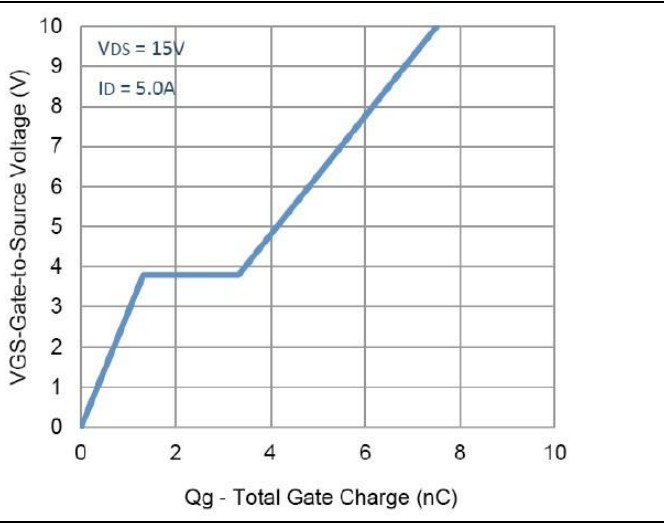


FIG.7-GATE CHARGE CHARACTERISTIC

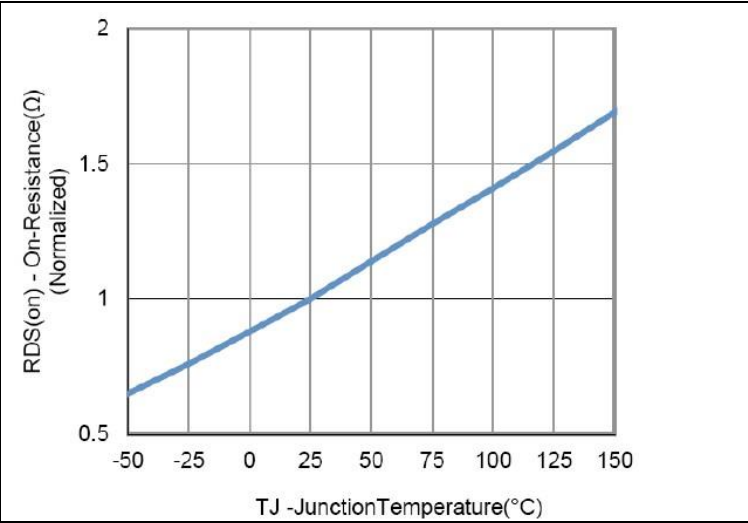


FIG.8-CAPACITANCE CHARACTERISTIC

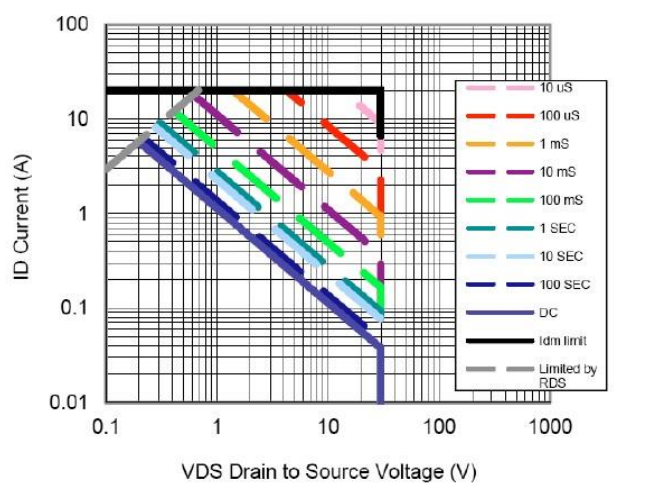


FIG.9-MAXIMUM SAFE OPERATING AREA

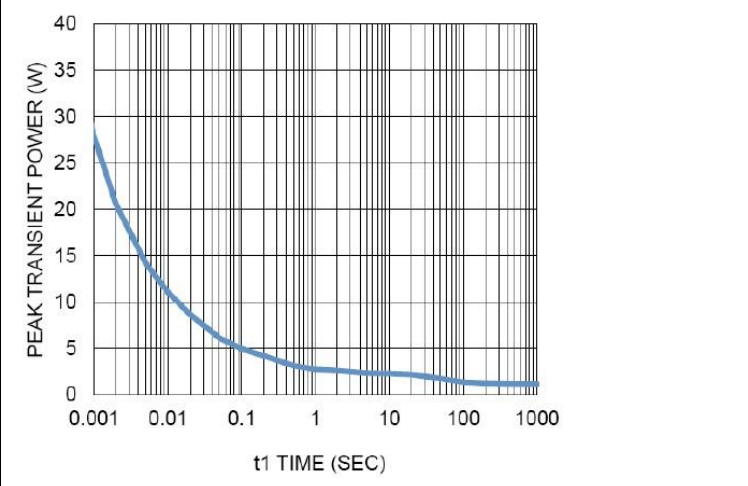


FIG.10-BREAKDOWN VOLTAGE VARIATION WITH TEMPERATURE

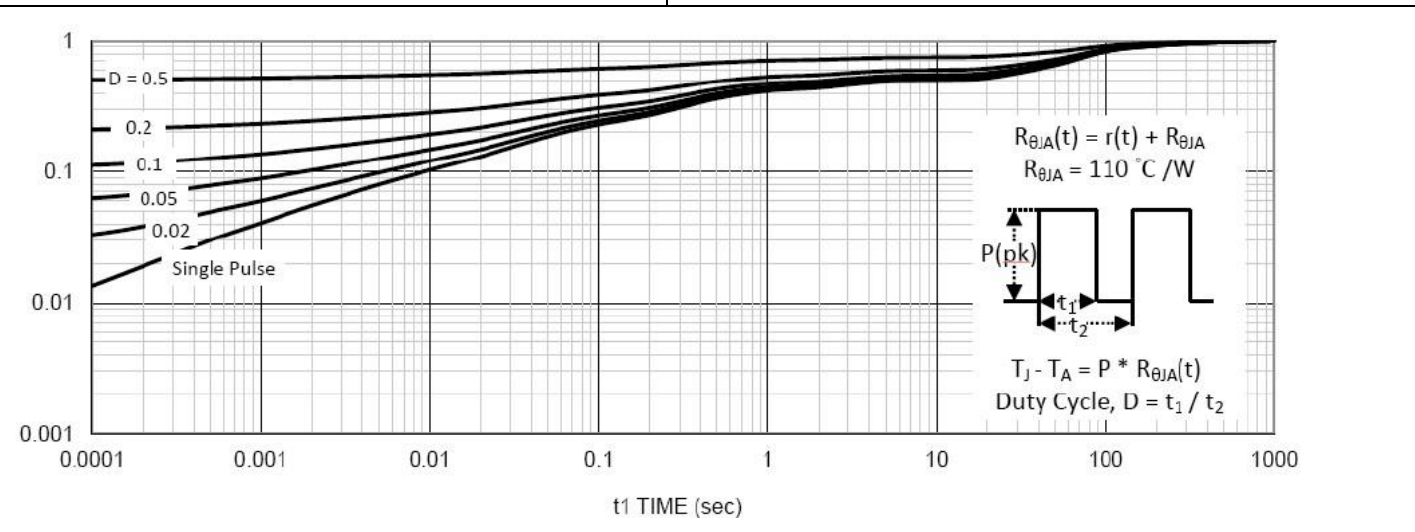


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

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