Preliminary MSD50N03

N-Channel Logic Level Enhancement Mode Power 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.

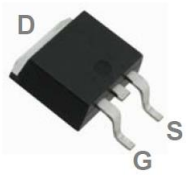
Features

- VDS=30V, ID=50A, RDS(ON)=9mΩ
- Low Gate Charge
- Repetitive Avalanche Rated
- Simple Drive Requirement
- Fast Switching Characteristic
- RoHS compliant package

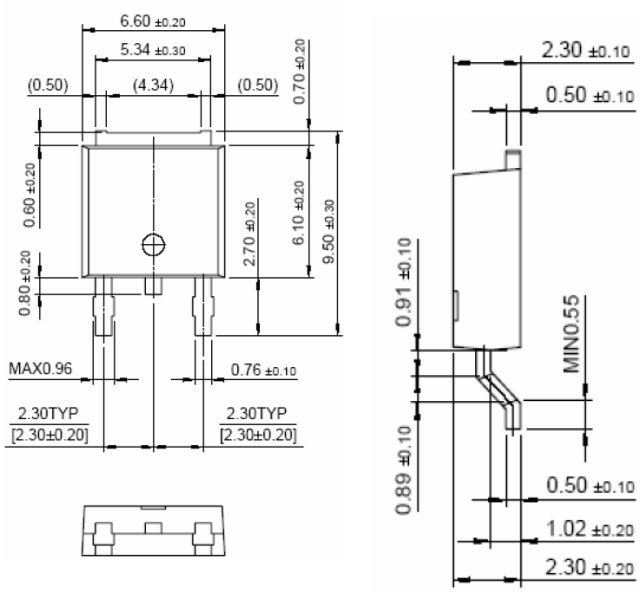
Packing & Order Information

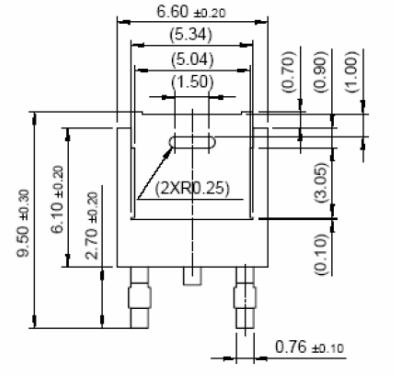
Part No./ T：2,500/Reel

Part No./ R：80/Tube , 4,000/Box

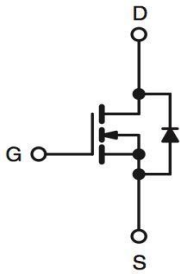


RoHS COMPLIANT





Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current @ TC=25°C	50	A
	Continuous Drain Current @ TC=100°C	35	A

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Absolute Maximum Ratings (Tc=25°C unless otherwise noted)			
Symbol	**Parameter**	**Value**	**Unit**
I_{DM}*1	Pulsed Drain Current	140	A
I_{AS}	Avalanche Current	37.5	A
E_{AS}	Avalanche Energy @ L=0.1mH , ID = 37.5 A , Rg = 25 Ω	70	mJ
E_{AR}*2	Repetitive Avalanche Energy @ L=0.05mH	15	mJ
P_D	Power Dissipation (TC=25°C)	60	W
	Power Dissipation (TC=100°C)	32	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

Note:

100% UIS testing in condition of VD=15V, L=0.1mH, VG=10V, IL=25A, Rated VDS=25V N-CH

*1. Pulse width limited by maximum junction temperature

*2. Duty cycle≤1%

Thermal Characteristics (Tc=25°C unless otherwise noted)			
Symbol	**Parameter**	**Maximum**	**Units**
Rthjc	Typical thermal resistance	2.5	°C/W
$R_{\theta JA}$	Typical thermal resistance	75	

Static Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
V_{GS}	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	3.0	V
*$R_{DS(ON)}$	V_{GS} = 10 V , I_D = 25 A V_{GS} = 5 V , I_D =20 A	--	75 12	9 15	mΩ
BV_{DSS}	V_{GS} = 0 V , I_D = 250 μA	30	--	--	V
I_{DSS}	V_{DS} = 24 V , V_{GS} = 0 V V_{DS} = 20 V , V_{GS} = 0 V , T_j = 125°C	--	--	1 25	uA
$I_{D(ON)}$	V_{DS} = 10 V, V_{DS} = 10 V	50	--	--	A
I_{GSS}	V_{DS} = ±20	--	--	±100	nA
G_{FS}	V_{DS} = 5 V, V_{DS} = 20 V	--	20	--	S

Dynamic Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
C_{ISS}	V_{DS} = 15 V, V_{GS} = 0 V, F = 1.0MHz	--	2020	--	pF
C_{OSS}		--	275	--	pF
C_{RSS}		--	160	--	pF

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Dynamic Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
$t_{d(on)}$	V_{DS} = 150 V, I_D = 25 A, R_G = 2.7 Ω , V_{GS} = 10 V R_D = 0.6 Ω	--	10	--	ns
t_r		--	8	--	ns
$t_{d(off)}$		--	30	--	ns
tf		--	5	--	ns
Q_g(V_{GS} = 10 V)	V_{DS} = 15 V , I_D = 25 A, V_{GS} = 10 V	--	23	--	nC
Q_g(V_{GS} = 5 V)		--	13	--	nC
Q_{gs}		--	4.7	--	nC
Q_{gd}		--	7.4	--	nC
Rg	V_{GS} = 15 mV, V_{DS} = 0 , f = 1MHz	--	1.7	--	Ω

Source-Drain Diode Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
I_S		--	--	50	A
I_{SM}		--	--	140	
V_{SD}	IF = IS , V_{GS} = 0 V	--	--	1.3	V
t_{rr}	IF = IS , V_{GS} = 0 V , dIF/dt=100A/μs	--	22	--	ns
IRM(REC)		--	180	--	A
Q_{rr}		--	12	--	nC

*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

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