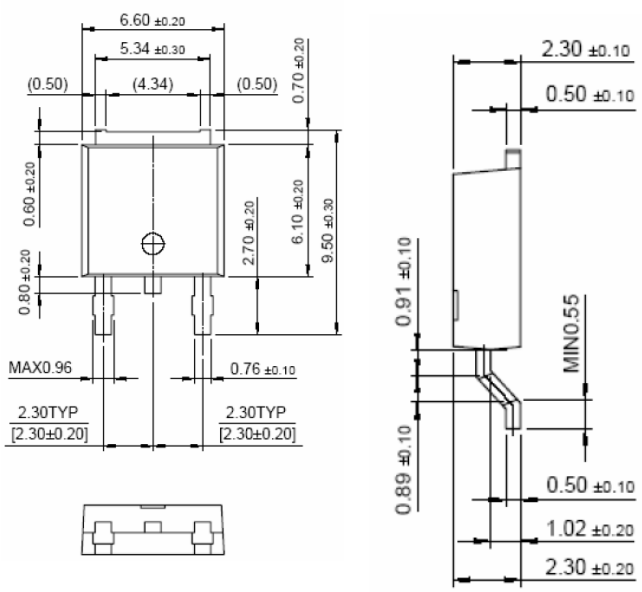
MSD20N10

N-Channel 100-V (D-S) MOSFET

Description

The MSD4N60 is a N-channel enhancement-mode MOSFET , providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-252 package is universally preferred for all commercial-industrial applications



Features

- Low rDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

Application

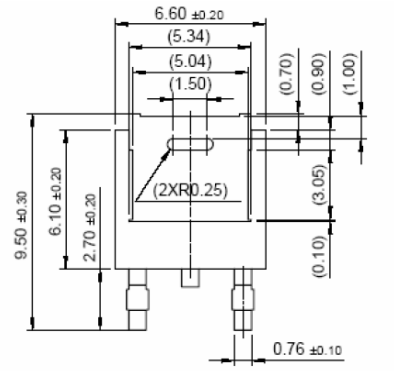
- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

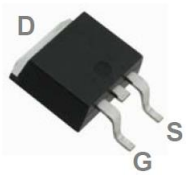
Package type：TO-252

Packing & Order Information

Part No./ R：2,500/Reel

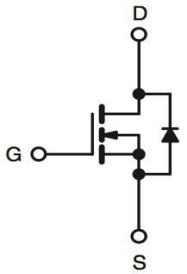
Part No./ T：80/Tube , 4,000/Box





RoHS COMPLIANT

Graphic symbol



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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current (T_C=25°C)	11	A
I_{DM}	Pulsed Drain Current[b]	50	A
I_S	Continuous Source Current (Diode Conduction)	28	mJ
P_D	Power Dissipation (T_C=25°C)	50	W
T_J,T_{STG}	Operating Junction and Storage Temperature	-55 to + 175	°C

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Maximum Junction-to-Case	--	3	°C/W
$R_{\theta JA}$	Maximum Junction-to- Ambient[a]	--	40	

Notes

a.Surface Mounted on 1" x 1" FR4 Board, drain pad using 2 oz copper, value dependent on PC board thermal characteristics

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	1		3.5	V
I_{GSS}	Gate-Body Leakage	V_{DS} = 0 V, V_{GS} = 20 V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80 V, V_{GS} = 0 V V_{DS} = 80 V, V_{GS} = 0 V, TJ = 55°C			1 25	uA
$I_{D(on)}$	On-State Drain Current	V_{DS} = 5 V, V_{GS} = 10 V	34			A
$r_{DS(on)}$	Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 4.5 A V_{GS} = 4.5 V, I_D = 4 A			280 355	mΩ
gfs	Forward Transconductance	V_{GS} = 15 V , I_D = 4.5 A		5		S
V_{SD}	Diode Forward Voltage	I_S = 14 A , V_{GS} = 0 V		0.95		V

Dynamic

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	V_{DD} = 50 V, I_D = 4.5 A, R_{GEN} = 6 Ω , R_L = 14.3 Ω V_{GEN} = 10 V	--	4.8	--	ns
t_r	Turn-On Time		--	3.9	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	12.7	--	ns
tf	Turn-Off Fall Time		--	3.2	--	ns

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Dynamic						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = 50 V, I_D = 4.5 A, V_{GS} = 4.5 V	--	3.8	--	nC
Q_{gs}	Gate-Source Charge		--	1.3	--	nC
Q_{gd}	Gate-Drain Charge		--	1.7	--	nC
C_{ISS}	Input Capacitance	V_{DS} = 15 V, V_{GS} = 0 V, f = 1.0MHz	--	332	--	pF
C_{OSS}	Output Capacitance		--	40	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	29	--	pF
Rq	Gate Resistance	f = 1.0MHz	--	0.3	--	Ω

Notes

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

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

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■Typical Electrical Characteristics

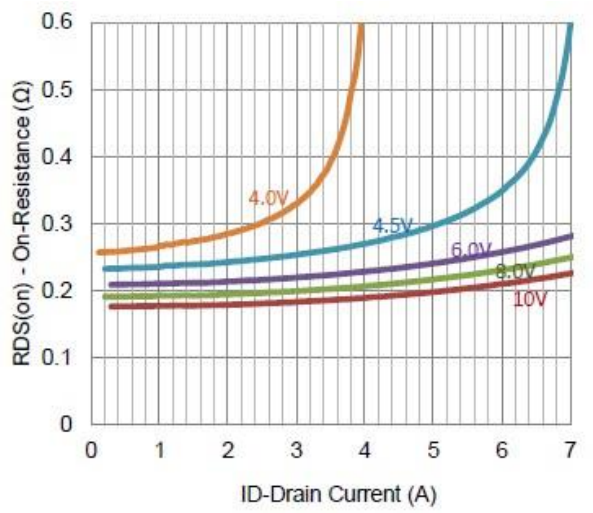

FIG.1-ON REGION VS DRAIN CURRENT

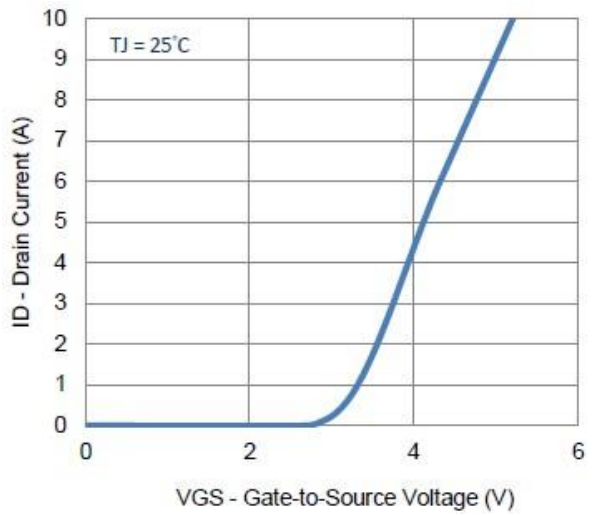

FIG.2-TRANSFER CHARACTERISTICS

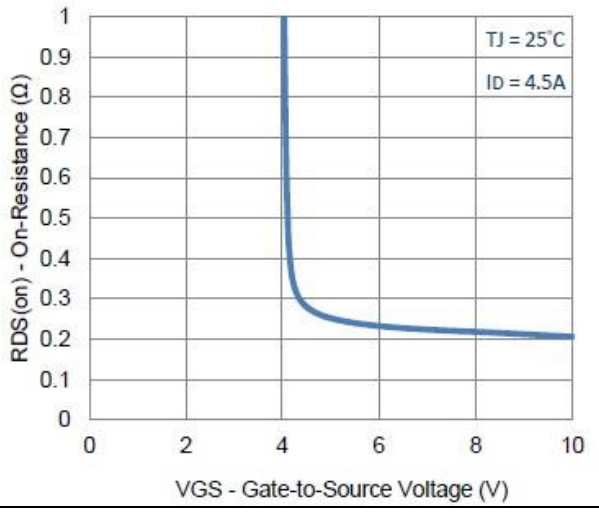

FIG.3-ON-RESISTANCE VS GATE-TO-SOURCE VOLTAGE

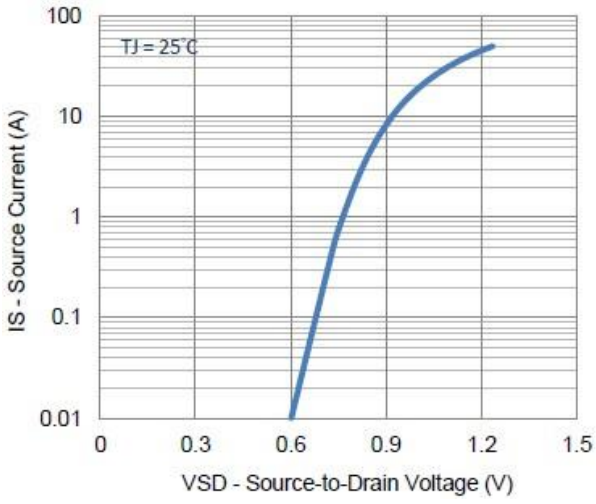

FIG.4-DRAIN-TO-SOURCE FORWARD VOLTAGE

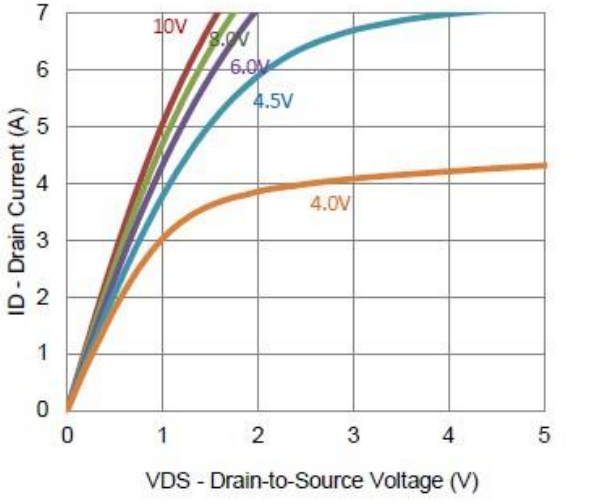

FIG.5-OUTPUT CHARACTERISTICS

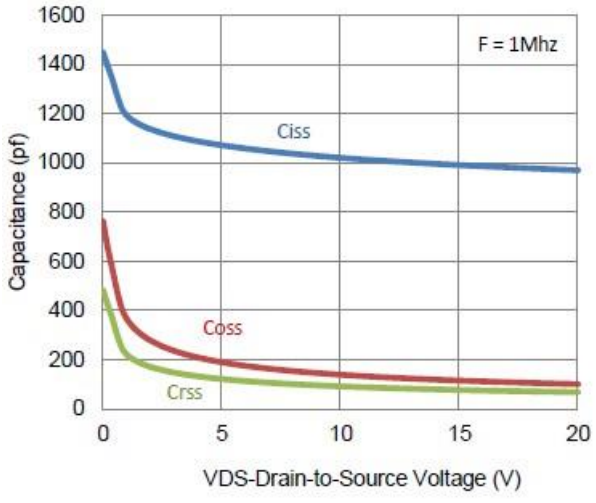

FIG.6-CAPACITANCE

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■Typical Electrical Characteristics

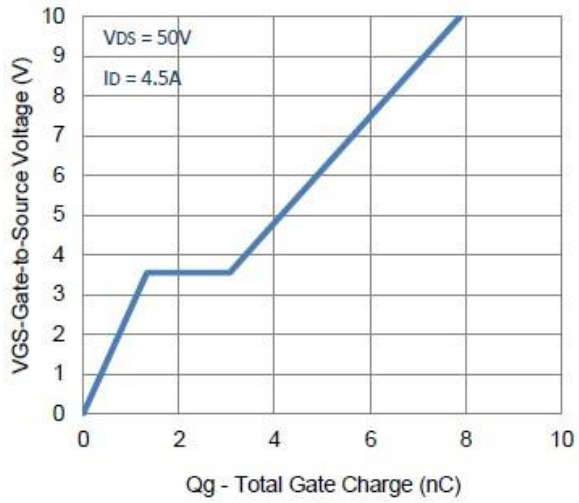

FIG.7-GATE CHARGE

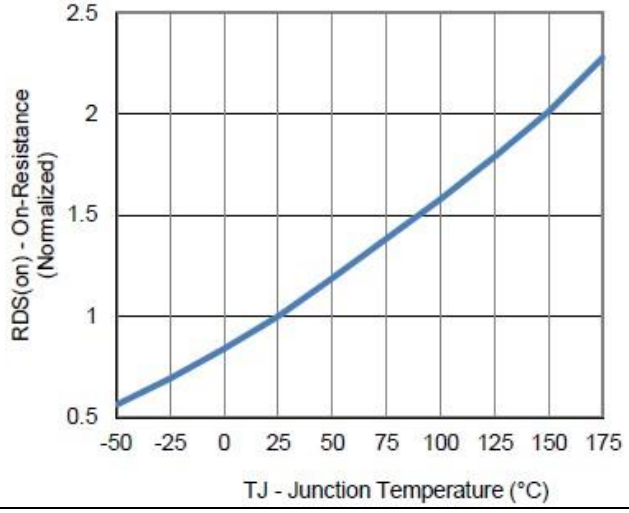

FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

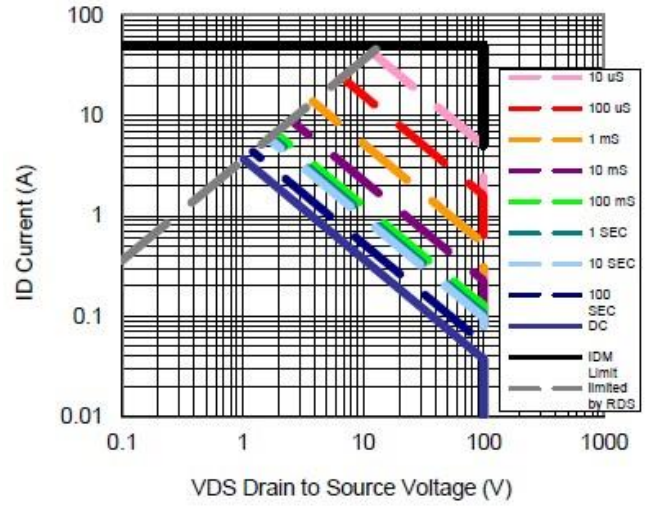

FIG.9-SAFE OPERATING AREA

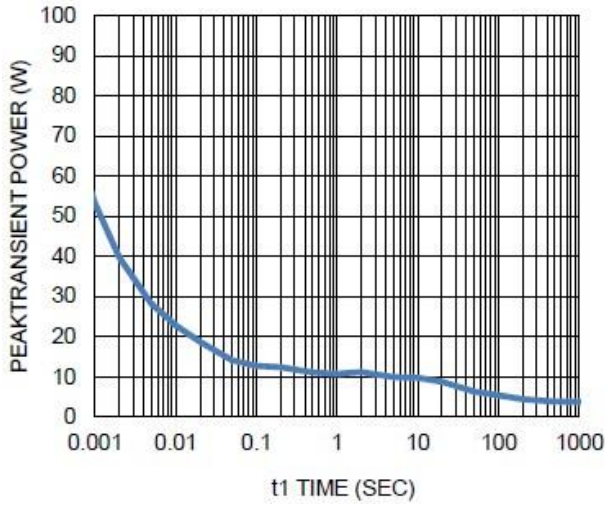

FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

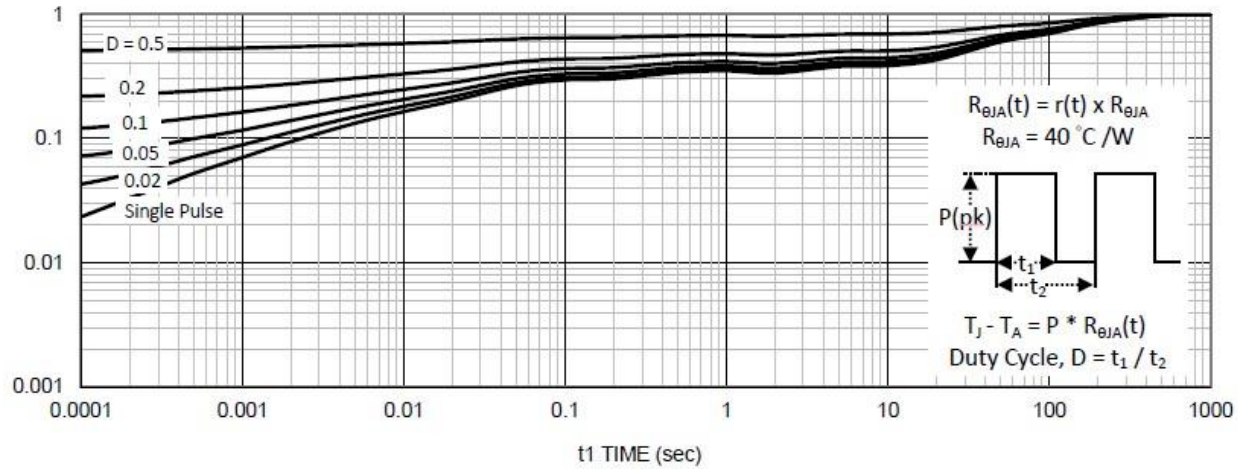

FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

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