

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

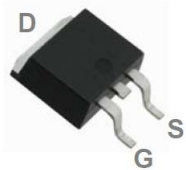
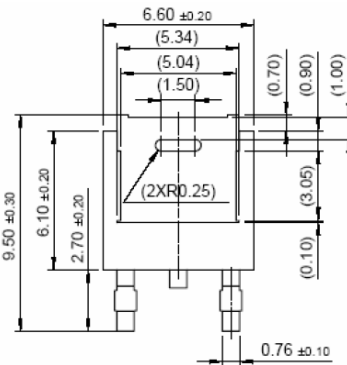
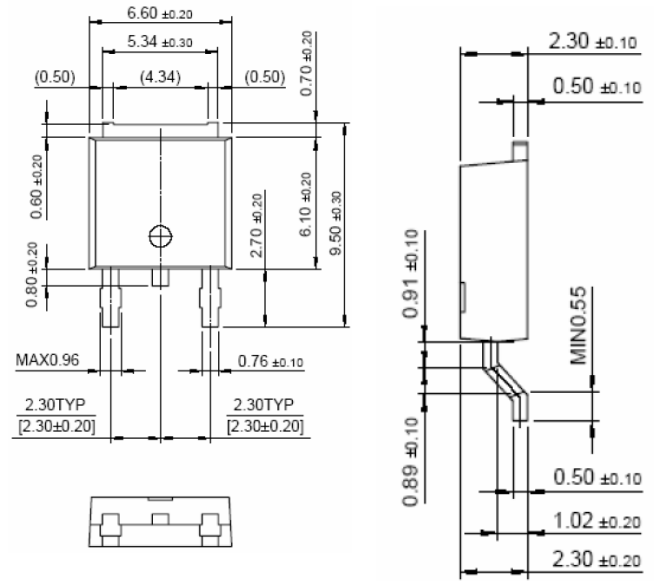
Application

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

Packing & Order Information

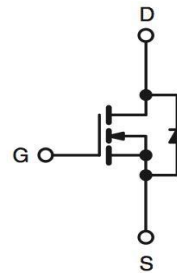
Part No./ T : 2,500/Reel

Part No./ R : 80/Tube , 4,000/Box



RoHS
COMPLIANT

Graphic symbol



MSD20N10

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

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	11	A
I_{DM}	Pulsed Drain Current ^b	50	A
I_S	Continuous Source Current (Diode Conduction)	28	mJ
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	50	W
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to + 175	$^\circ\text{C}$

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Maximum Junction-to-Case	--	3	$^\circ\text{C/W}$
$R_{\theta JA}$	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	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1		3.5	V
I_{GSS}	Gate-Body Leakage	$V_{DS} = 0\text{ V}, V_{GS} = 20\text{ V}$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$ $V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$			1 25	μA
$I_{D(on)}$	On-State Drain Current	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	34			A
$r_{DS(on)}$	Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}$ $V_{GS} = 4.5\text{ V}, I_D = 4\text{ A}$			280 355	m Ω
g_{fs}	Forward Transconductance	$V_{GS} = 15\text{ V}, I_D = 4.5\text{ A}$		5		S
V_{SD}	Diode Forward Voltage	$I_S = 14\text{ A}, V_{GS} = 0\text{ V}$		0.95		V

Dynamic

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

MSD20N10

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

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

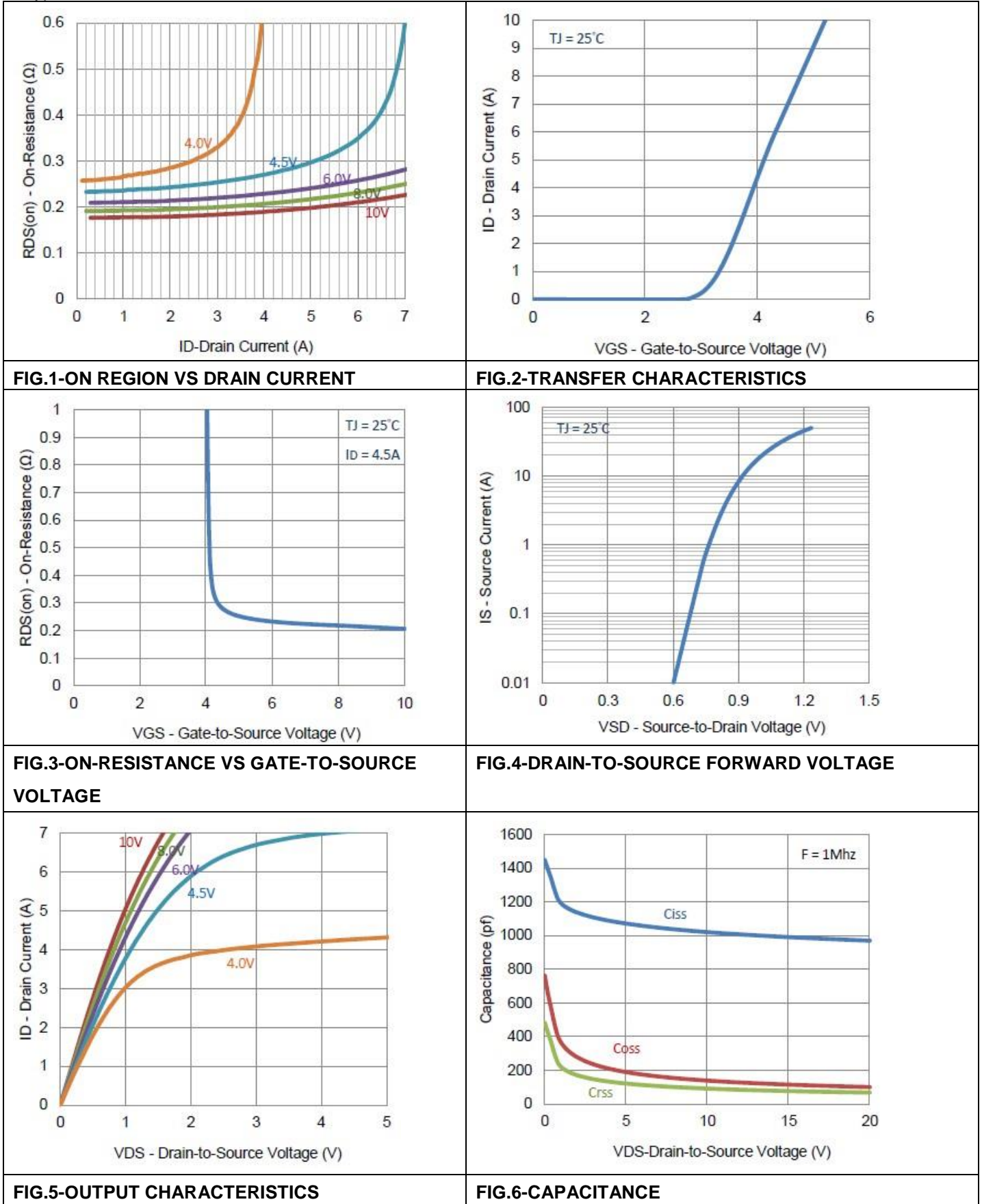
Notes

- Pulse test: $PW \leq 300\mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

MSD20N10

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

Typical Electrical Characteristics



MSD20N10

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

Typical Electrical Characteristics

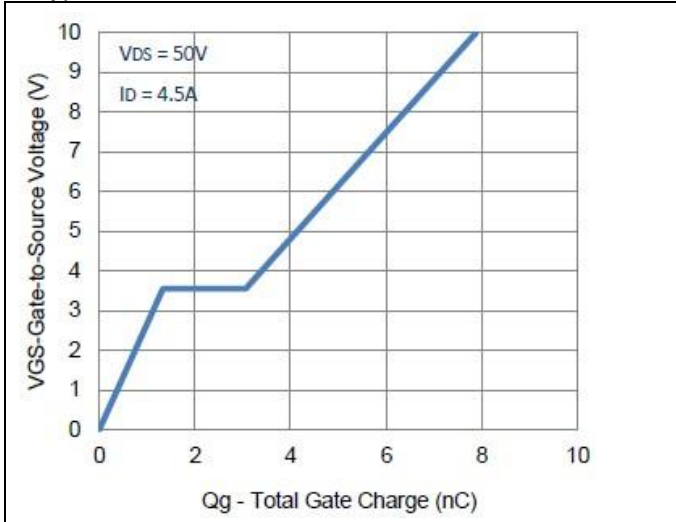


FIG.7-GATE CHARGE

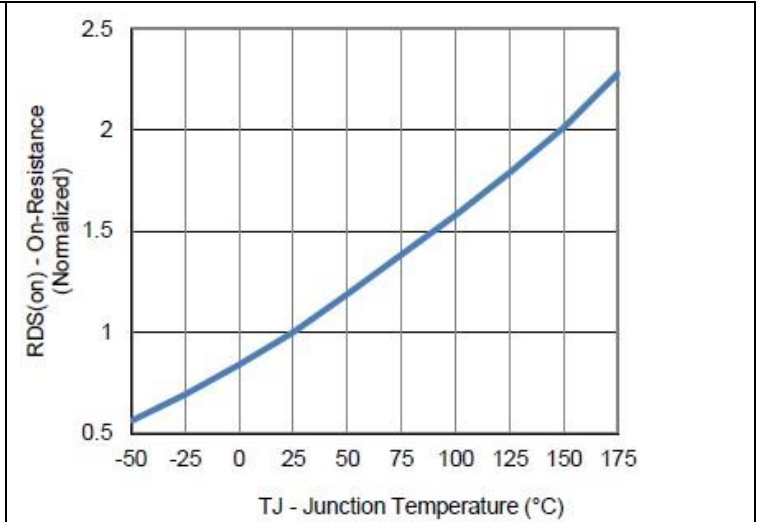


FIG.8-NORMALIZED ON-RESISTANCE VS JUNCTION TEMPERATURE

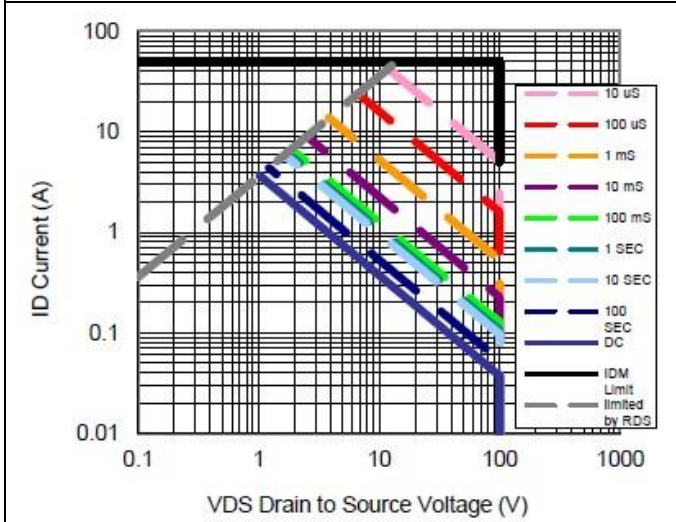


FIG.9-SAFE OPERATING AREA

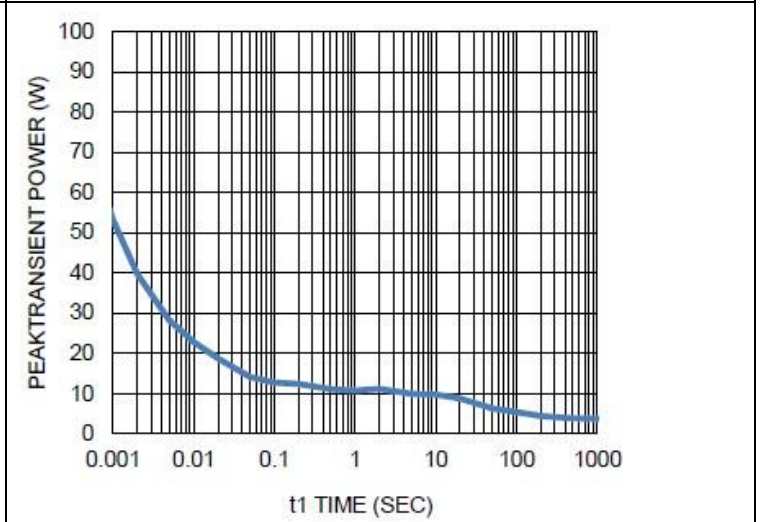


FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

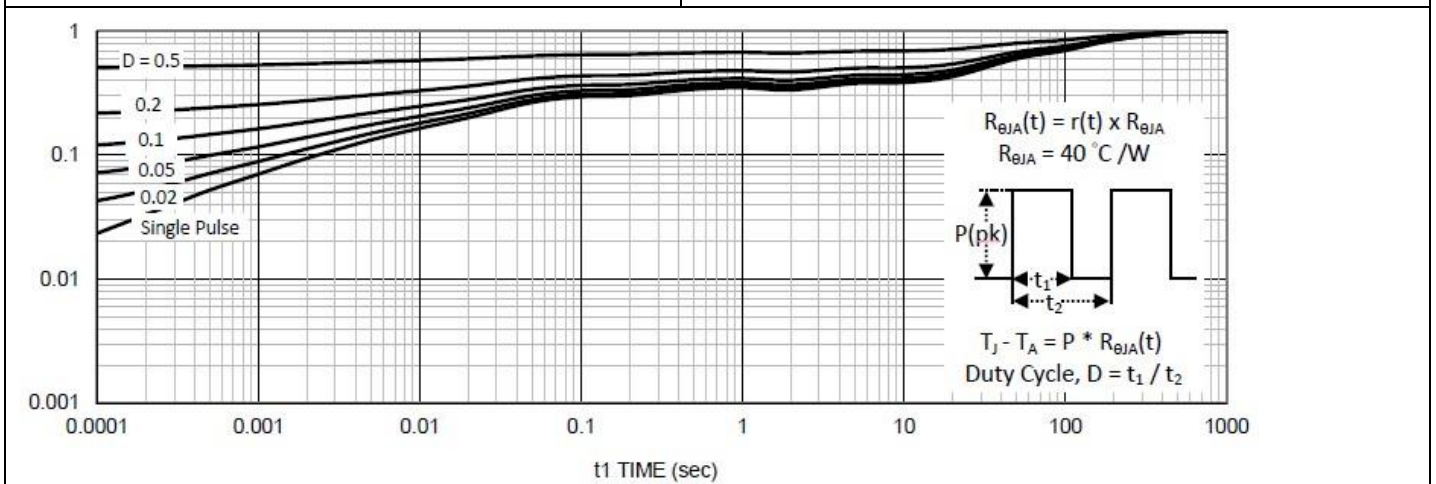


FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

MSD20N10

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

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE. Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Bruckewell"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product. Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

- (i) Any and all liability arising out of the application or use of any product.
- (ii) Any and all liability, including without limitation special, consequential or incidental damages.
- (iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell's knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell's terms and conditions of purchase, including but not limited to the warranty expressed therein.