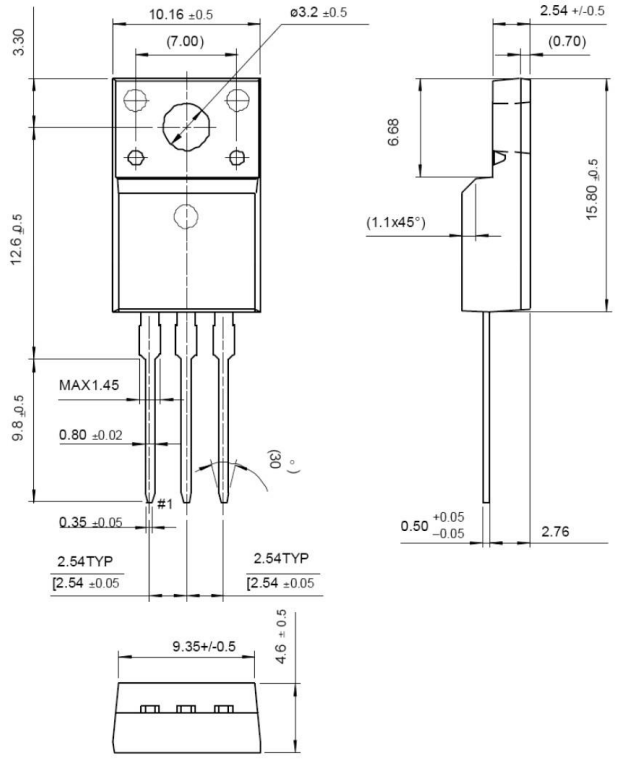
MS10N80

800V N-Channel MOSFET

Description

The MS10N80 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-220 package is universally preferred for all commercial-industrial applications



Features

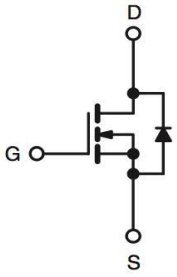
- Originative New Design
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Unrivalled Gate Charge : 46nC (Typ.)
- Extended Safe Operating Area
- Lower RDS(ON) : 1.10 Ω (Typ.) @VGS=10V
- 100% Avalanche Tested
- RoHS compliant package

Packing & Order Information

50/Tube ; 1,000/Box

RoHS COMPLIANT

Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	800	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current -Continuous (TC=25°C)	10	A
	Drain Current -Continuous (TC=100°C)	6.5	A
I_{DM}	Drain Current Pulsed	40	A
E_{AS}	Single Pulsed Avalanche Energy	960	mJ
E_{AR}	Repetitive Avalanche Energy	24	mJ
I_{AR}	Avalanche Current	9.2	A
dv/dt	Peak Diode Recovery dv/dt	4.0	V/ns
P_D	Total Power Dissipation(@TC = 25 °C) 44 W	60	W
	Derating Factor above 25 °C	0.48	W/°C

MS10N80

800V N-Channel MOSFET

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

Symbol	Parameter	Value	Unit
T_J,T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C

• Drain current limited by maximum junction temperature

Thermal Resistance Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	--	1.43	°C/W
$R_{\theta JA}$	Junction-to-Ambient	--	--	62.5	

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V_{GS}	Gate Threshold Voltage	V_{DS} = V_{GS},I_D = 250μA	3.0	--	5.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V,I_D = 5.0 A	--	1.7	2.1	Ω

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V , I_D = 250μA	800	--	--	V
ΔBV_{DSS} /ΔT_J	Breakdown Voltage Temperature Coefficient	I_D = 250μA, Referenced to 25°C	--	1.0	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 800 V , V_{GS} = 0 V V_{DS} = 640 V , T_C = 125°C	--	--	10 100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V , V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V , V_{DS} = 0 V	--	--	-100	nA

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f=1.0MHz	--	2200	--	pF
C_{OSS}	Output Capacitance		--	190	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	20	--	pF

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	Turn-On Time	V_{DS} = 400 V, I_D = 7 A, R_G = 25 Ω	--	60	--	ns
t_r	Turn-On Time		--	150	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	110	--	ns

MS10N80

800V N-Channel MOSFET

tf	Turn-Off Fall Time		--	90	--	ns

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = 640 V,I_D = 10 A, V_{GS} = 10 V	--	46	--	nC
Q_{gs}	Gate-Source Charge		--	15	--	nC
Q_{gd}	Gate-Drain Charge		--	20	--	nC

Source-Drain Diode Maximum Ratings and Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_S	Continuous Source-Drain Diode Forward Current		--	--	10	A
I_{SM}	ISM Pulsed Source-Drain Diode Forward Current		--	--	40	
V_{SD}	Source-Drain Diode Forward Voltage	I_S = 7 A , V_{GS} = 0 V	--	--	1.4	V
t_{rr}	Reverse Recovery Time	I_S = 7 A , V_{GS} = 0 V diF/dt=100A/μs	--	730	--	ns
Q_{rr}	Reverse Recovery Charge		--	12	--	μC

Notes;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=18mH, I_{AS}=10A, V_{DD}=5V, R_G=25Ω, Starting T_J=25℃
3. I_{SD}≦7A, di/dt≦200A/μs,V_{DD}≦BV_{DSS}, Starting T_J=25℃
4. Pulse Test: Pulse Width ≦ 300μs, Duty Cycle≦ 2%
5. Essentially Independent of Operating Temperature

MS10N80

800V N-Channel MOSFET

■Characteristics Curve

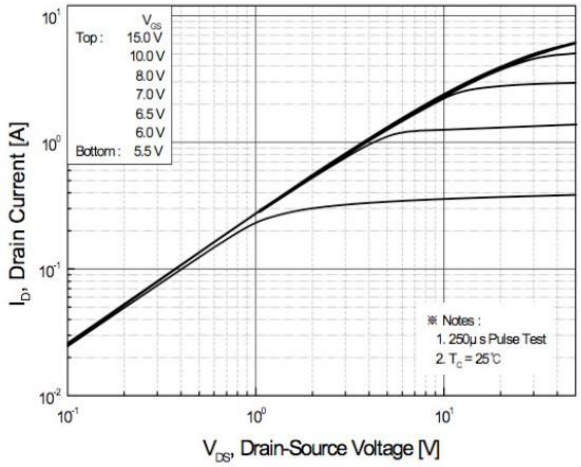


FIG.1-ON REGION CHARACTERISTICS

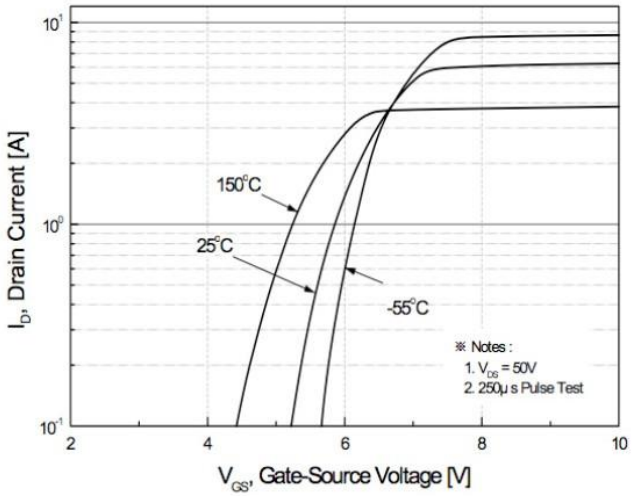


FIG.2-TRANSFER CHARACTERISTICS

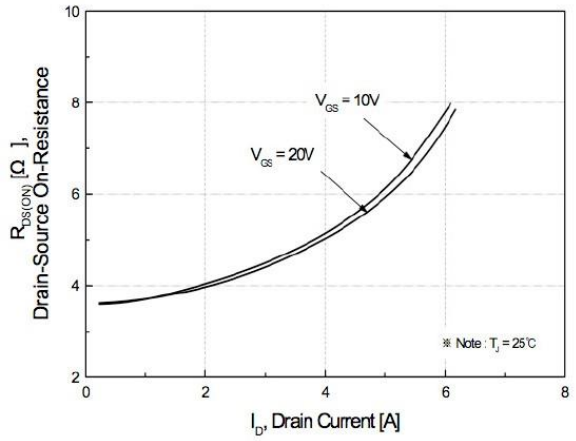


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

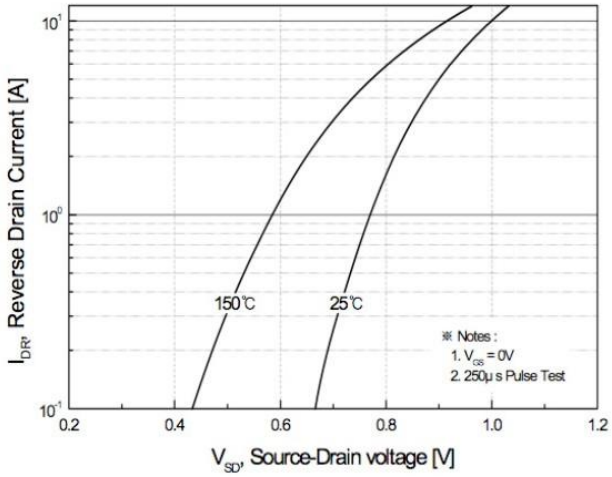


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

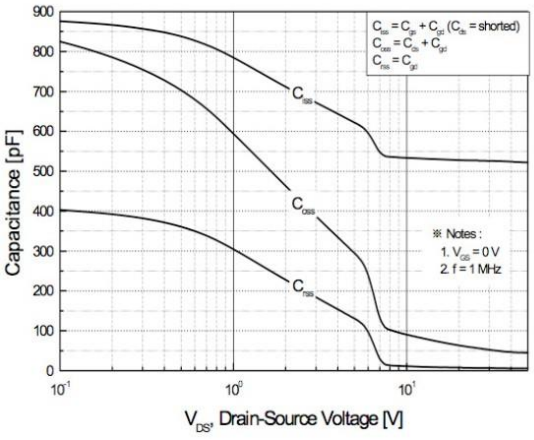


FIG.5-CAPACITANCE CHARACTERISTICS

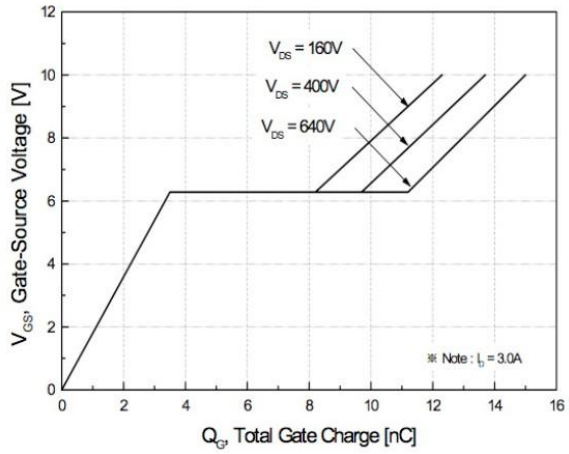


FIG.6-GATE CHARGE CHARACTERISTICS

MS10N80

800V N-Channel MOSFET

■Characteristics Curve

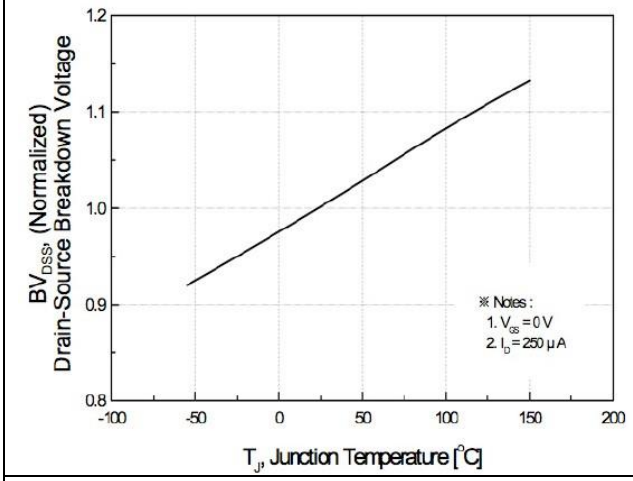


FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

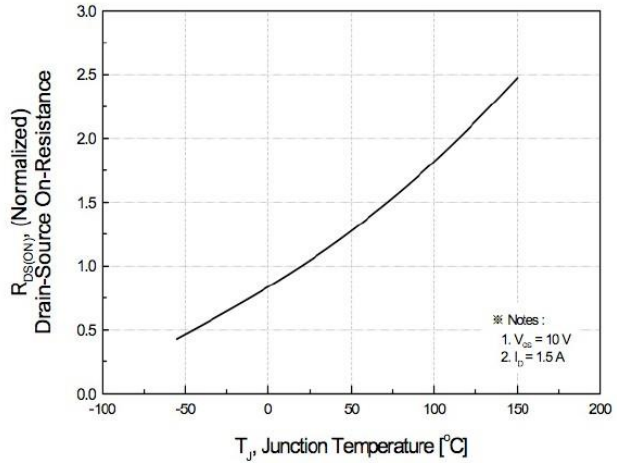


FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

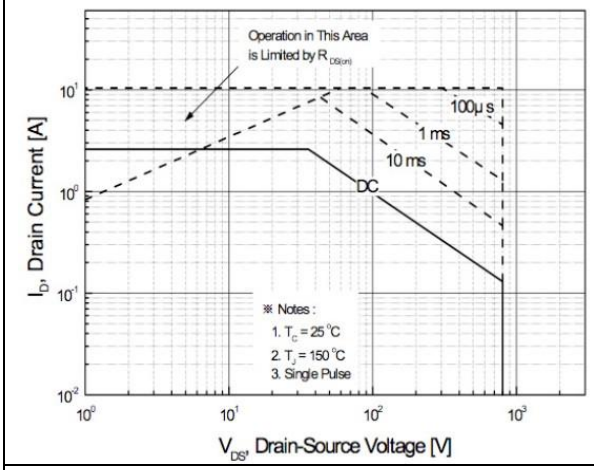


FIG.9-MAXIMUM SAFE OPERATING AREA

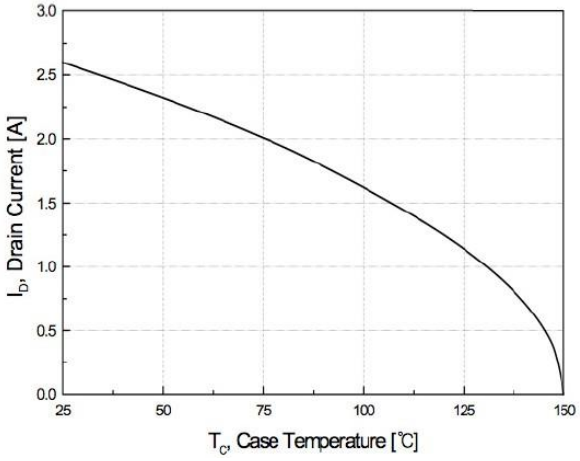


FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

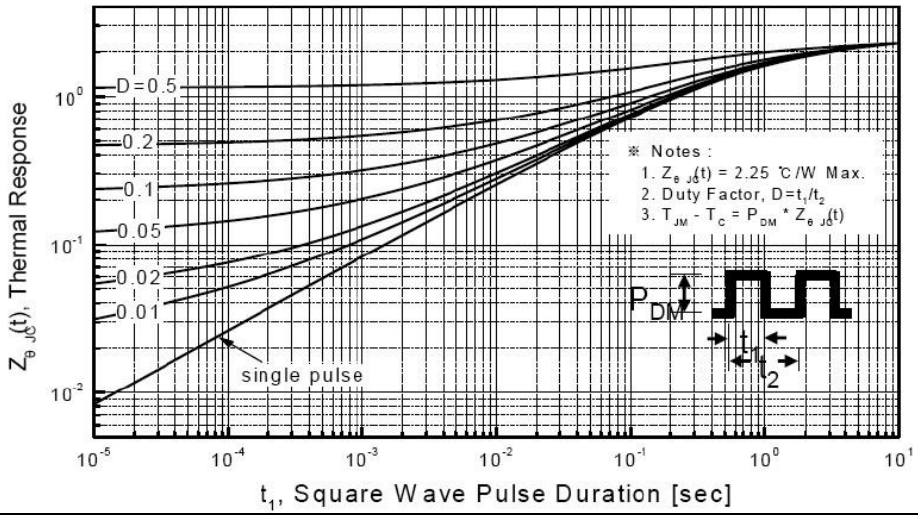


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

MS10N80

800V N-Channel 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.