MSF15N60

N-Channel Enhancement Mode Power MOSFET

Description

The MSF15N60 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-220F package is universally preferred for all commercial-industrial applications

Features

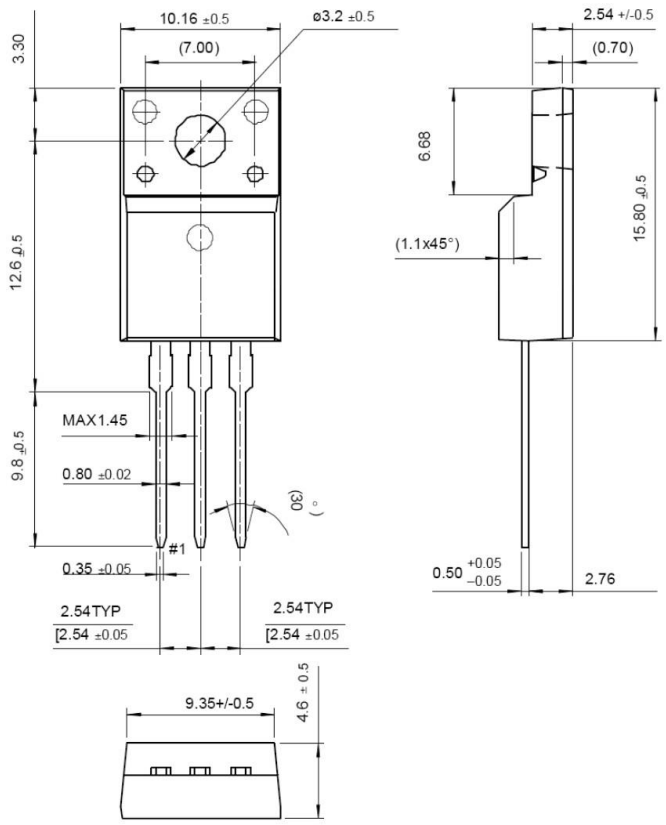
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

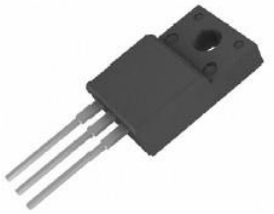
Application

- Adapter
- Switching Mode Power Supply

Packing & Order Information

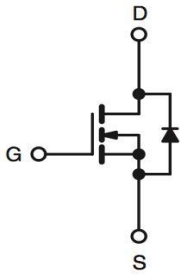
50/Tube ; 1,000/Box





RoHS
COMPLIANT

Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current -Continuous (TC=25°C)	15	A
	Drain Current -Continuous (TC=100°C)	9.5	A
I_{DM}	Drain Current Pulsed	60	A
E_{AS}	Single Pulsed Avalanche Energy	245	mJ
I_{AR}	Avalanche Current	15	A
E_{AR}	Repetitive Avalanche Energy	24	mJ
dV/dt	Peak Diode Recovery dV/dt	9.8	V/ns

©Bruckewell Technology Corporation Rev. A -2014

MSF15N60

N-Channel Enhancement Mode Power MOSFET

Absolute Maximum Ratings			
Symbol	**Parameter**	**Value**	**Unit**
P_D	Total Power Dissipation(@TC = 25 °C) 60 W	53	W
	Derating Factor above 25 °C	0.42	W/°C

• Drain current limited by maximum junction temperature

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)			
Symbol	**Parameter**	**Value**	**Unit**
T_L	Maximum Temperature for Soldering @ Lead at 0.125 in(0.318mm) from case for 10 seconds	300	°C
T_{STG}	Operating Junction Temperature	-55 ~ 150	W
T_J	Storage Temperature	150	°C

Note:

1.Repetitive rating; pulse width limited by maximum junction temperature.

2. IAS=15A, VDD=50V, L=0.5mH, RG=25Ω, starting TJ=+25°C.

3. ISD≤7.5A, dI/dt≤100A/μs, VDD≤BVDSS, starting TJ=+25°C.

Thermal characteristics			
Symbol	**Parameter**	**Max.**	**Units**
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.58	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	

Static Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	--	4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V,I_D=7.5A	--	0.42	0.52	Ω
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0 V , I_D=250μA Tj=150°C	600	--	--	V
ΔBV_{DSS} /ΔT_J	Breakdown Voltage Temperature Coefficient	I_D=250μA, Referenced to 25°C	--	0.7	--	V/°C
I_{DSS}	Drain-Source Leakage Current	V_{DS}=600V , V_{GS}= 0 V V_{DS}=480V , T_C= 125°C	--	--	1 10	μA
I_{GSS}	Gate-Body Leakage , Forward	V_{GS}=±30	--	--	±100	nA

©Bruckewell Technology Corporation Rev. A -2014

MSF15N60

N-Channel Enhancement Mode Power MOSFET

Dynamic Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
$t_{d(on)}$	Turn-On Time	V_{DS}=250 V, I_D=15A, V_{GS}=10V , R_G=9.1Ω	--	50	101	ns
t_r	Turn-On Time		--	78	162	ns
$t_{d(off)}$	Turn-Off Delay Time		--	120	261	ns
tf	Turn-Off Fall Time		--	66	128	ns
Q_g	Total Gate Charge	V_{DS}=250V,I_D=15A, V_{GS}=10 V	--	36	60	nC
Q_{gs}	Gate-Source Charge		--	9	--	nC
Q_{gd}	Gate-Drain Charge (Miller Charge)		--	16	--	nC

Dynamic Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
C_{ISS}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	--	2270	3000	pF
C_{OSS}	Output Capacitance		--	300	405	pF
C_{RSS}	Reverse Transfer Capacitance		--	23	37	pF

Source-Drain Diode Maximum Ratings and Characteristics						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
I_S		VD=VG=0, VS=1.3V	--	--	14	A
I_{SM}			--	--	60	
V_{SD}		I_S=12A , V_{GS}= 0V	--	--	1.4	V
t_{rr}		I_S=12A , V_{GS}= 0V diF/dt=100A/μs	--	600	--	ns
Q_{rr}			--	7.2	--	μC

©Bruckewell Technology Corporation Rev. A -2014

MSF15N60

N-Channel Enhancement Mode Power MOSFET

■Characteristics Curve

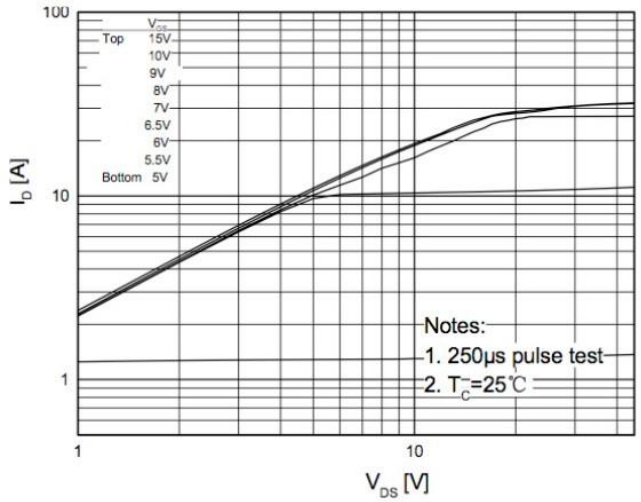


FIG.1-ON REGION CHARACTERISTICS

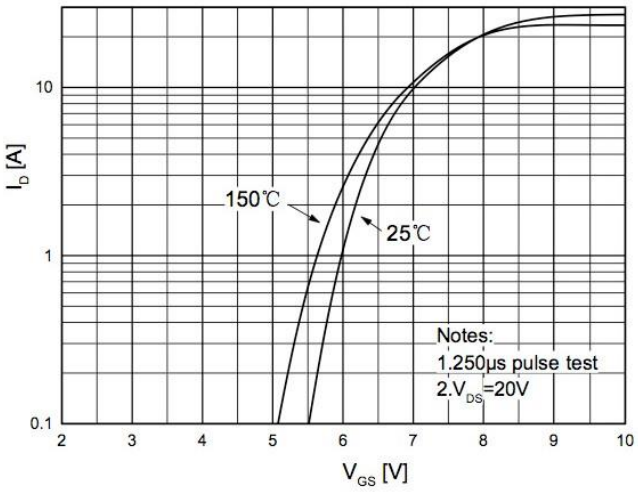


FIG.2-TRANSFER CHARACTERISTICS

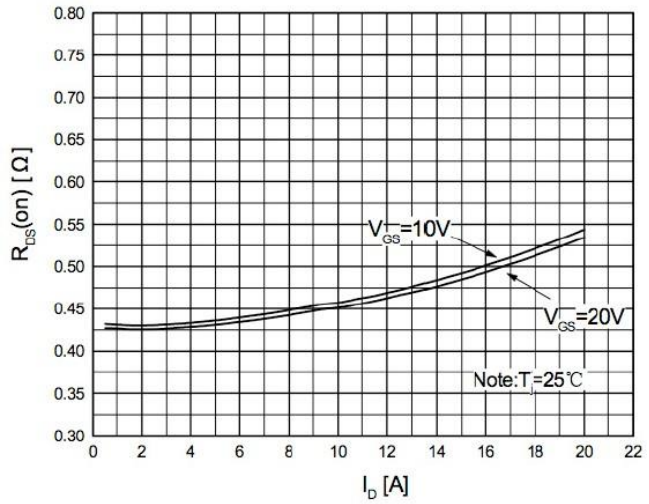


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

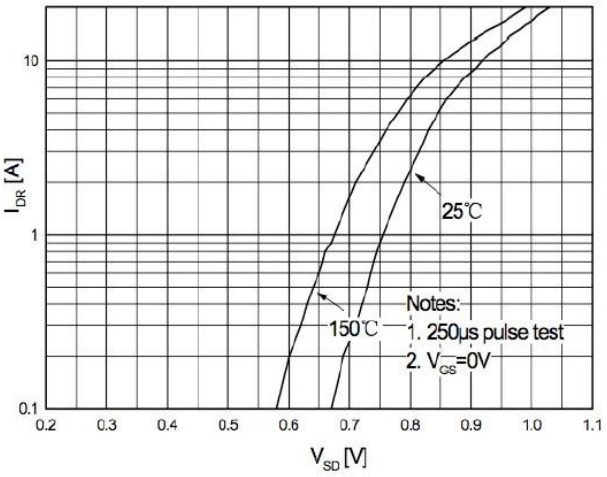


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

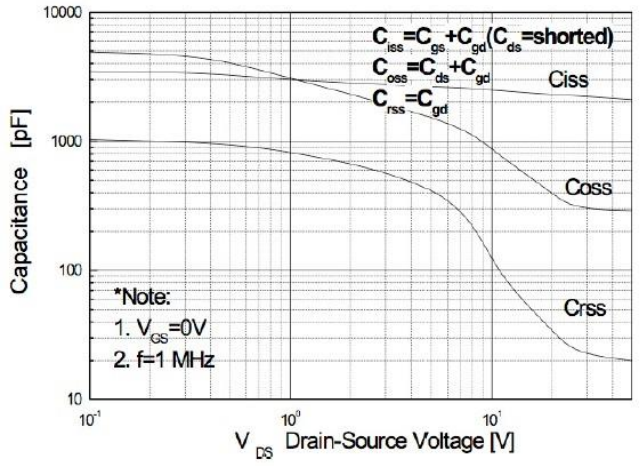


FIG.5-CAPACITANCE CHARACTERISTICS

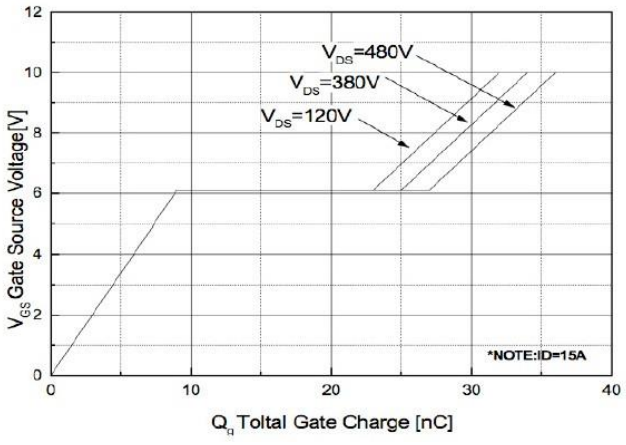


FIG.6-GATE CHARGE CHARACTERISTICS

©Bruckewell Technology Corporation Rev. A -2014

MSF15N60

N-Channel Enhancement Mode Power MOSFET

■Characteristics Curve

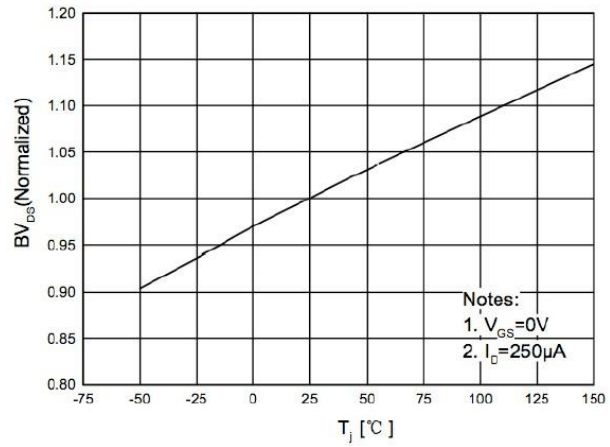


FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

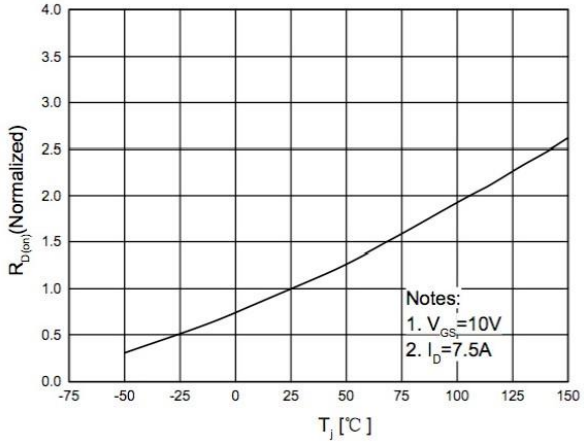


FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

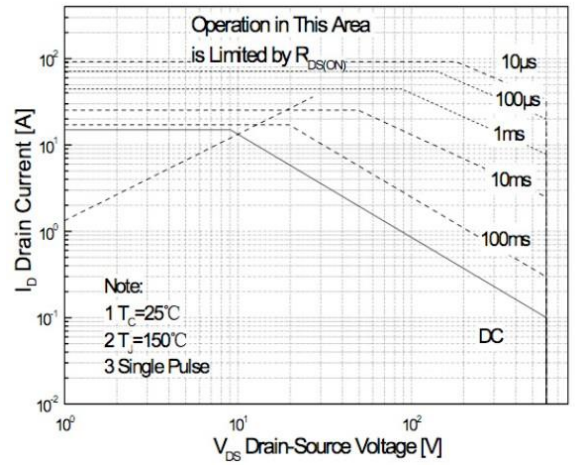


FIG.9-MAXIMUM SAFE OPERATING AREA

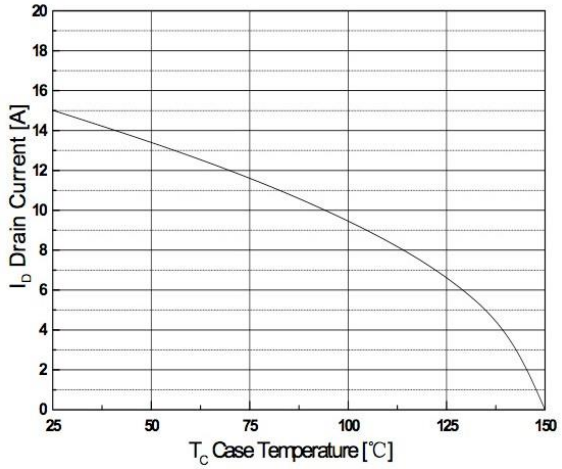


FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

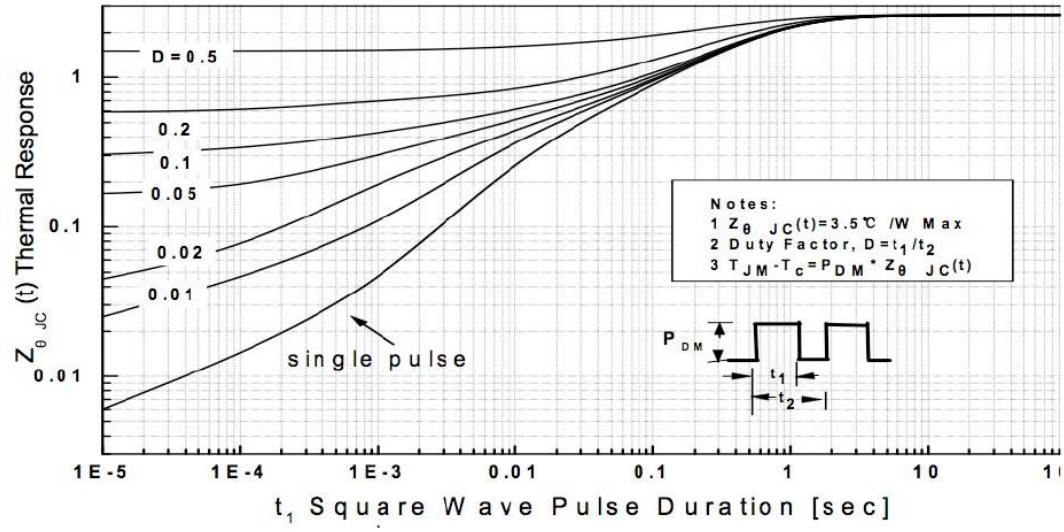


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

©Bruckewell Technology Corporation Rev. A -2014

MSF15N60

N-Channel Enhancement Mode Power 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.

©Bruckewell Technology Corporation Rev. A -2014