

## Features

- Epoxy Meets UL 94 V-0 Flammability Rating
- ESD Protected up to 2KV(HBM)
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

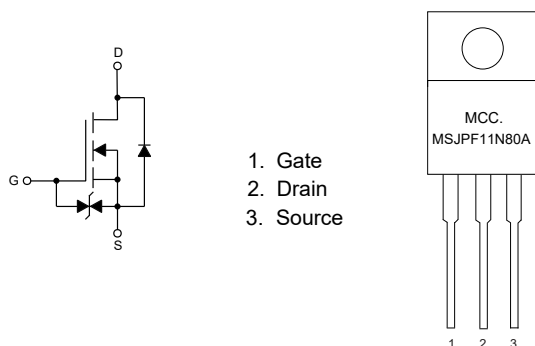
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient(Notes 2)
- Thermal Resistance: 5°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	800	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	11
		$T_C=100^\circ\text{C}$	6.9
Pulsed Drain Current (Note 3)	$I_{DM}$	33	A
Total Power Dissipation(Notes 4)	$P_D$	25	W
Single Pulse Avalanche Energy(Notes 5)	$E_{AS}$	142	mJ

Note:

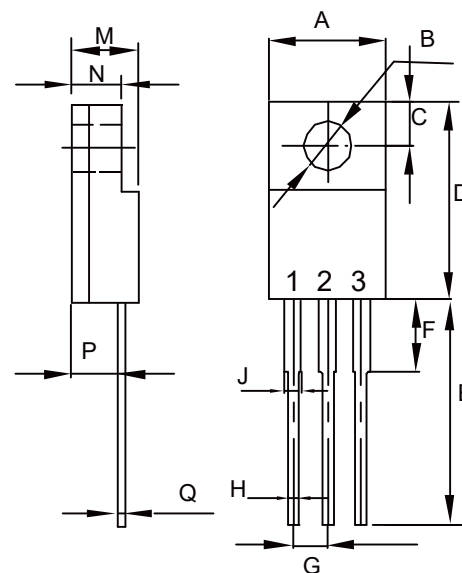
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA}$   $t \leq 10s$  and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
5.  $T_j = 25^\circ\text{C}$ ,  $V_{DD} = 50V$ ,  $V_{GS} = 10V$ ,  $L = 79mH$ ,  $I_{AS} = 1.9A$

## Internal Structure and Marking Code



# N-CHANNEL Super-Junction Power MOSFET

## TO-220F



### DIMENSIONS

DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.392	0.421	9.96	10.70	
B	0.138		3.50		φ
C	0.106		2.70		TYP.
D	0.567	0.642	14.40	16.30	
E	0.520		13.20		TYP.
F	---	0.177	---	4.50	
G	0.100		2.54		TYP.
H	0.020	0.035	0.50	0.90	
J	0.043	0.053	1.10	1.35	
M	0.169	0.201	4.30	5.10	
N	---	0.140	---	3.56	
P	0.083	0.126	2.10	3.20	
Q	0.020	0.032	0.50	0.80	

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	800			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	3.5	4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=7.1 A$		362	470	m $\Omega$
Gate Resistance	$R_g$	F=1 MHz, Open drain		25		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				11	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=11A$			1.4	V
Reverse Recovery Time	$t_{rr}$	$I_F=5.5A, dI_F/dt=100A/\mu s$		200		ns
Reverse Recovery Charge	$Q_{rr}$			1825		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=400V, V_{GS}=0V, f=1MHz$		958		pF
Output Capacitance	$C_{oss}$			26		
Reverse Transfer Capacitance	$C_{rss}$			12		
Total Gate Charge	$Q_g$	$V_{DS}=400V, V_{GS}=10V, I_D=5.5A$		24		nC
Gate-Source Charge	$Q_{gs}$			4.9		
Gate-Drain Charge	$Q_{gd}$			10		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, V_{GS}=10V, R_{GEN}=6\Omega, I_{DS}=5.5A$		12.4		ns
Turn-On Rise Time	$t_r$			16.3		
Turn-Off Delay Time	$t_{d(off)}$			14		
Turn-Off Fall Time	$t_f$			6		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

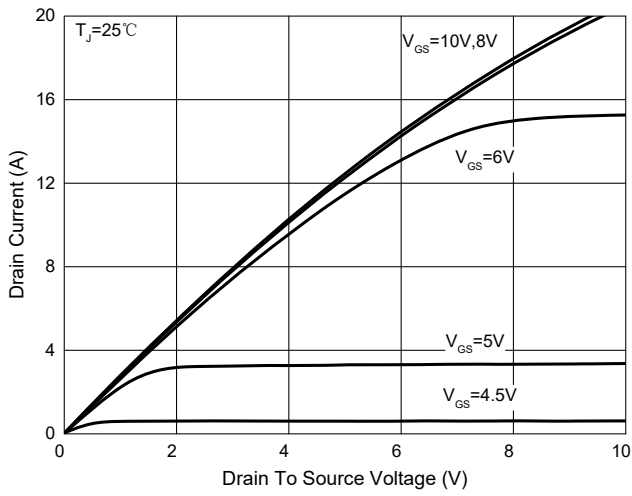


Fig. 2 - Transfer Characteristics

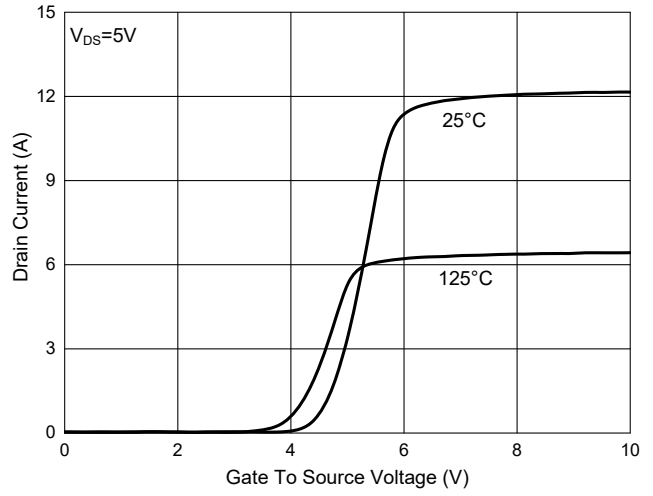


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

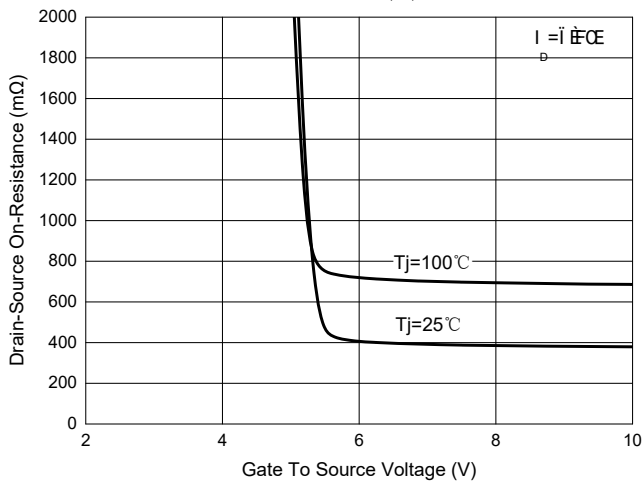


Fig. 4 - Normalized On Resistance Characteristics

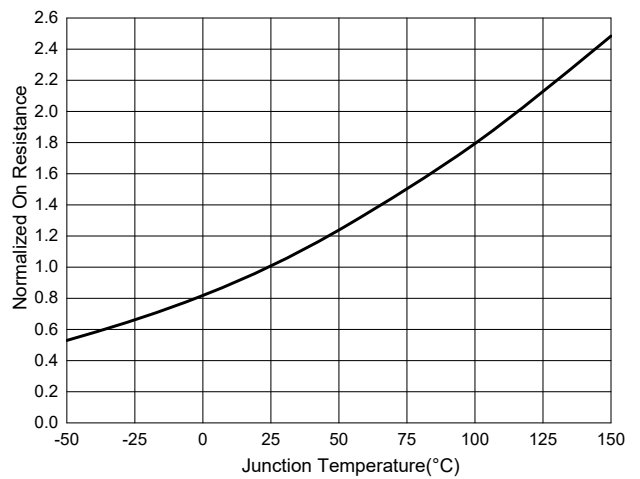


Fig. 5 - Capacitance Characteristics

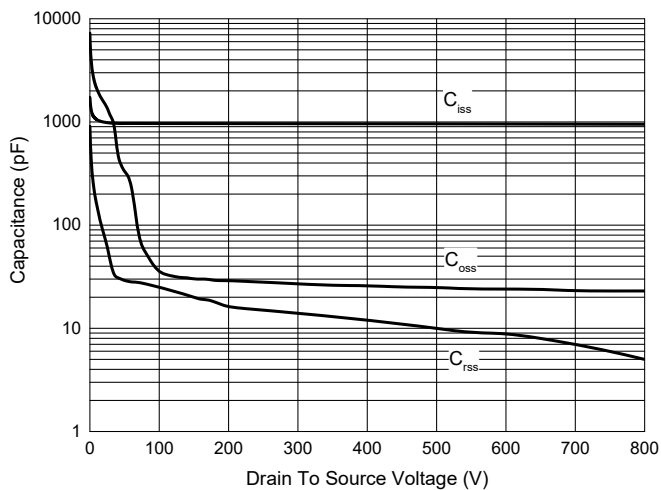
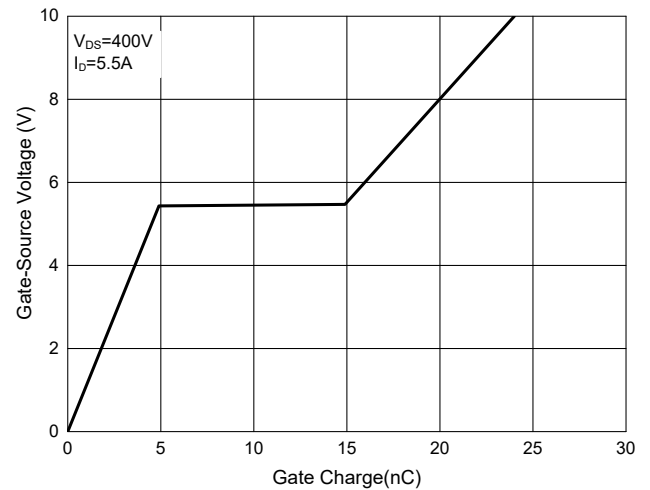


Fig. 6 - Gate Charge



**Curve Characteristics**

Fig. 7 -  $R_{DS(ON)} - I_D$

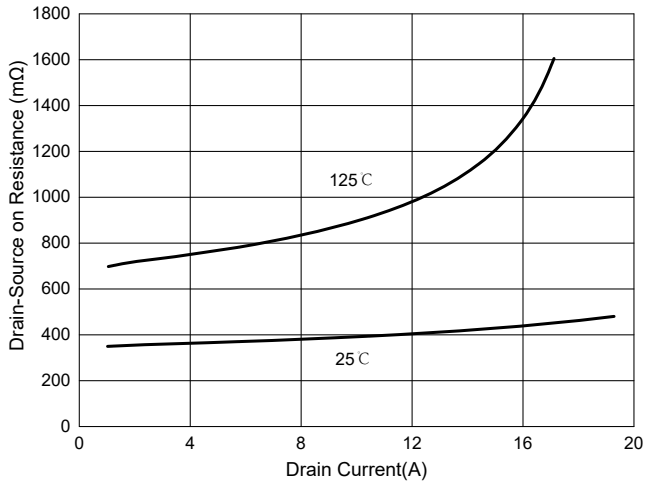


Fig. 8 - Normalized Threshold voltage

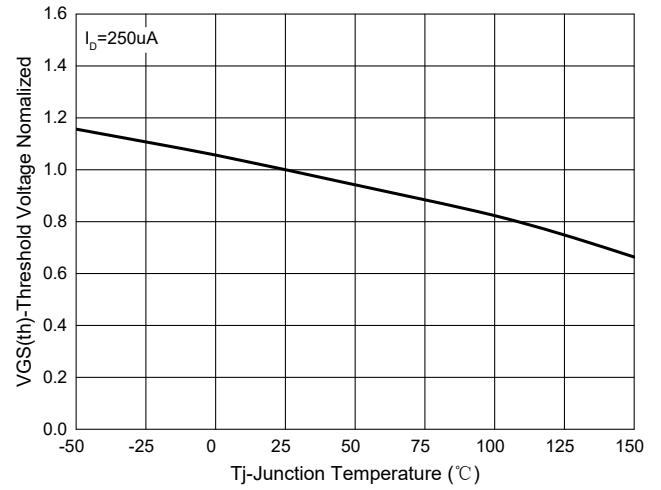


Fig. 9 -  $I_S - V_{SD}$

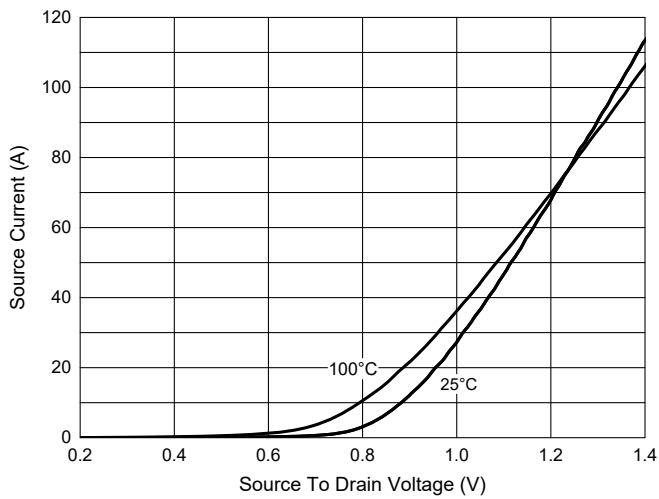


Fig. 10 - Current dissipation

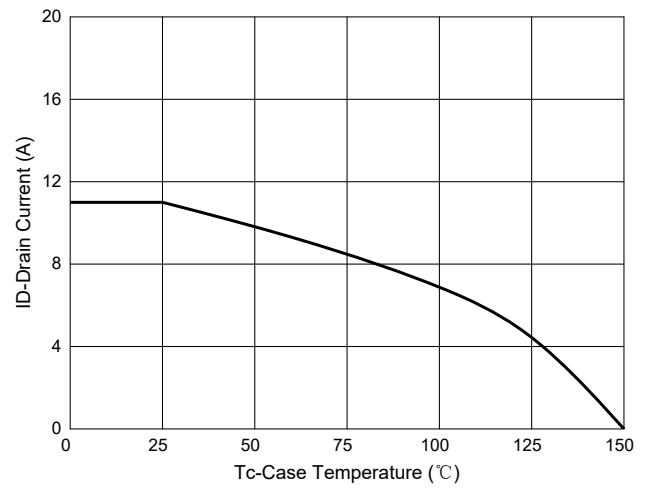
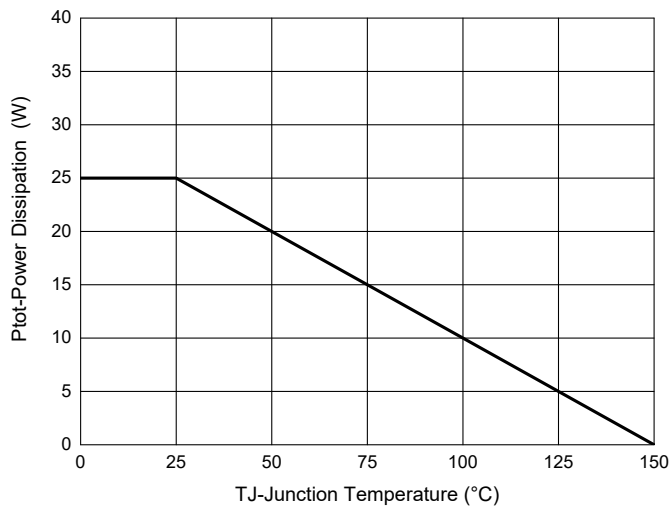


Fig. 11 - PD—TJ



Curve Characteristics

Fig. 12 - Safe Operation Area

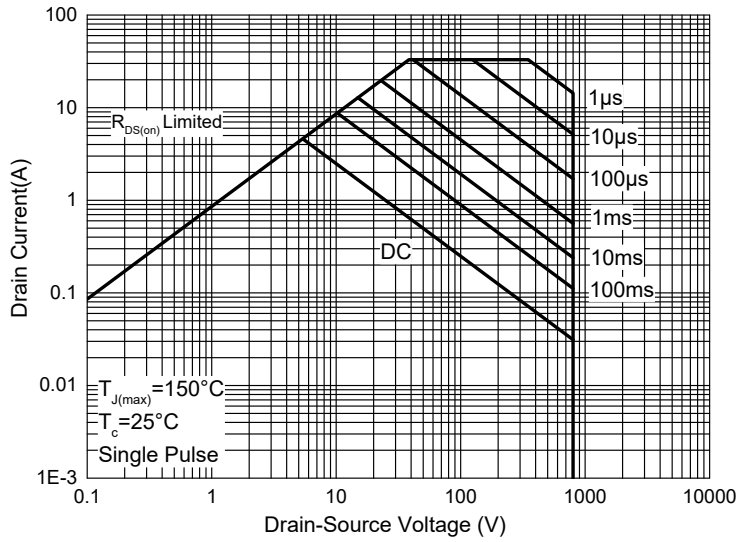
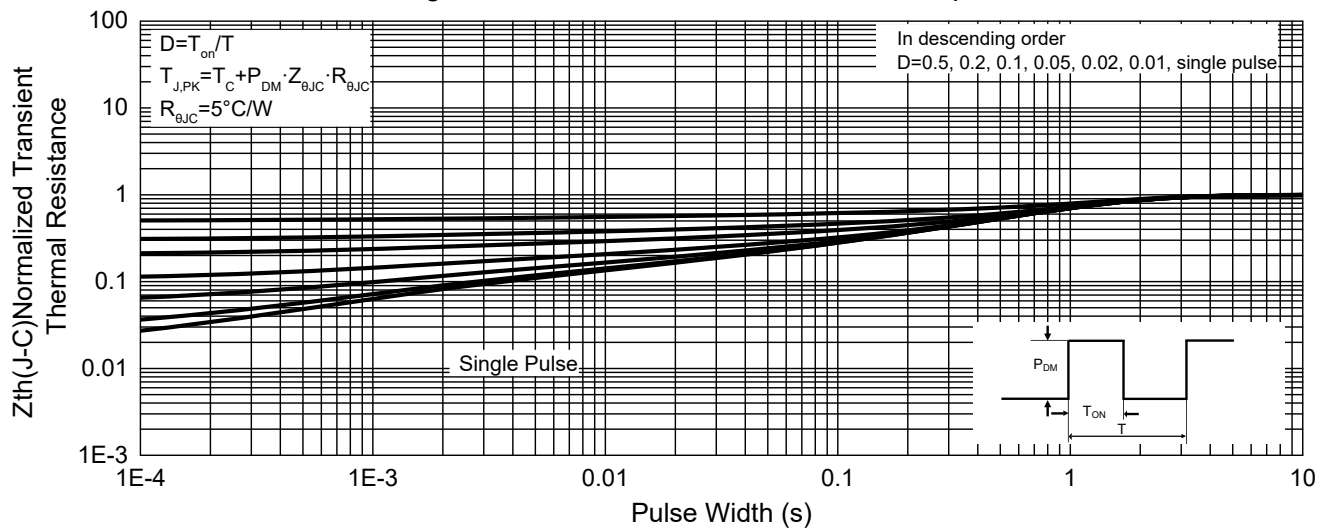


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-BP	Bulk:50pcs/Tube, 1Kpcs/Box,5Kpcs/Carton

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