

Features

- Very Low FOM $R_{DS(on)} \times Q_g$
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

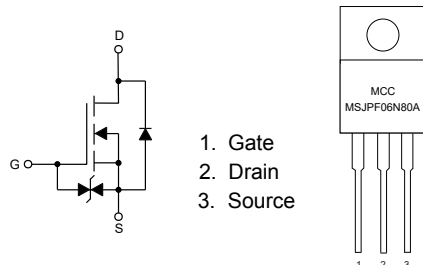
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 60°C/W Junction to Ambient^(Note2)
- Thermal Resistance: 2.5°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	800	V
Gate-Source Voltage		V _{GS}	±30	V
Continuous Drain Current	T _C =25°C	I _D	6	A
	T _C =100°C		3.8	
Pulsed Drain Current ^(Note3)		I _{DM}	24	A
Total Power Dissipation ^(Note4)		P _D	50	W
Single Pulsed Avalanche Energy ^(Note5)		E _{AS}	54	mJ

Note:

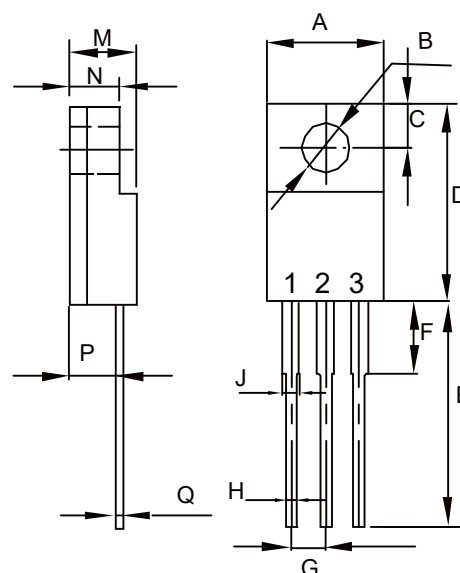
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
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. $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=30\text{mH}$.

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
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	800			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.5	3.5	4.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =2.5A		0.95	1.2	Ω
Gate Resistance	R _G	f=1MHz, Open drain		21		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				6	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =4.5A			1.4	V
Reverse Recovery Time	t _{rr}	I _S =6A, di/dt=100A/μs		295		ns
Reverse Recovery Charge	Q _{rr}			2300		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=400KHz		386		pF
Output Capacitance	C _{oss}			13		
Reverse Transfer Capacitance	C _{rss}			0.9		
Total Gate Charge	Q _g	V _{DS} =640V, V _{GS} =10V, I _D =4.5A		11.7		nC
Gate-Source Charge	Q _{gs}			2		
Gate-Drain Charge	Q _{gd}			6		
Turn-On Delay Time	t _{d(on)}	V _{DD} =400V, V _{GS} =10V, R _G =25Ω, I _D =4.5A		11		ns
Turn-On Rise Time	t _r			27		
Turn-Off Delay Time	t _{d(off)}			54		
Turn-Off Fall Time	t _f			22		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

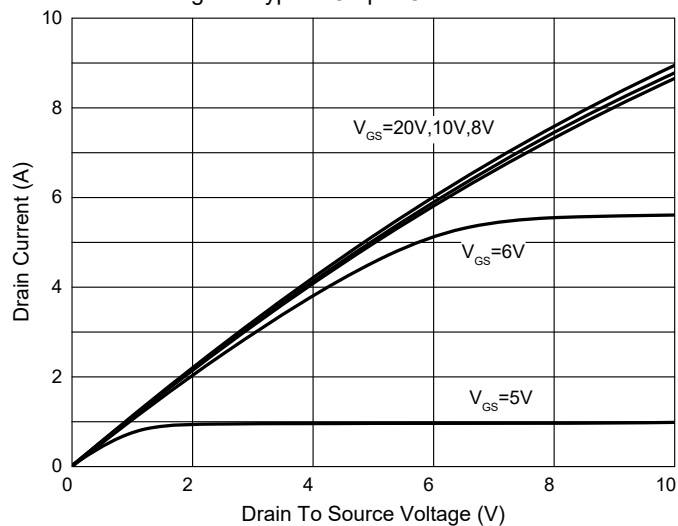


Fig. 2 - Transfer Characteristics

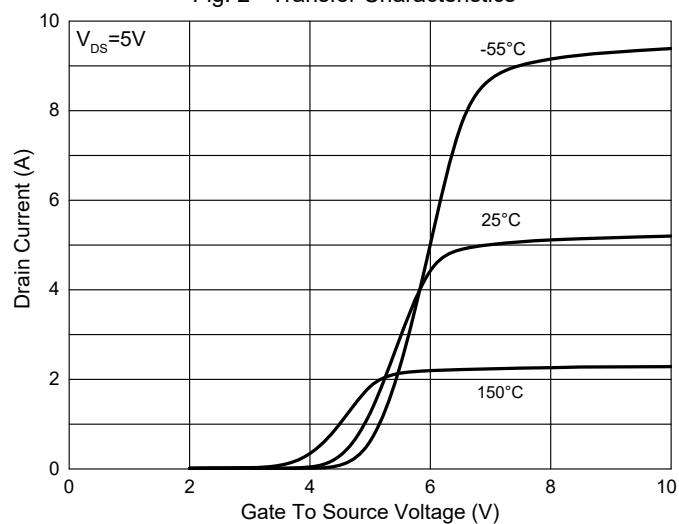


Fig. 3 - $R_{DS(ON)} - V_{GS}$

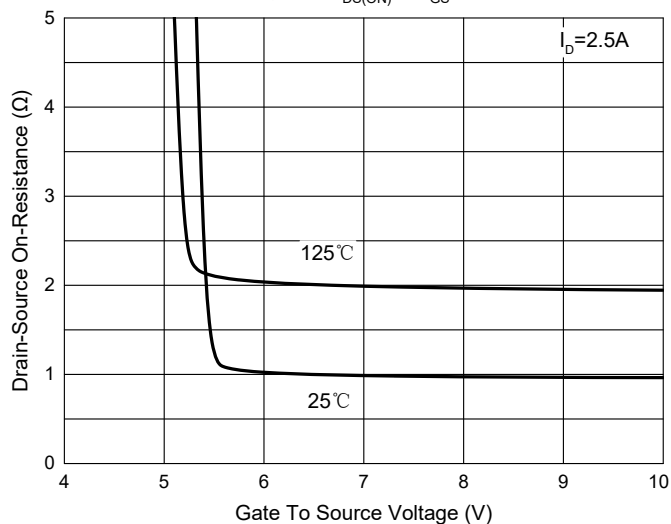


Fig. 4 - $R_{DS(ON)} - I_D$

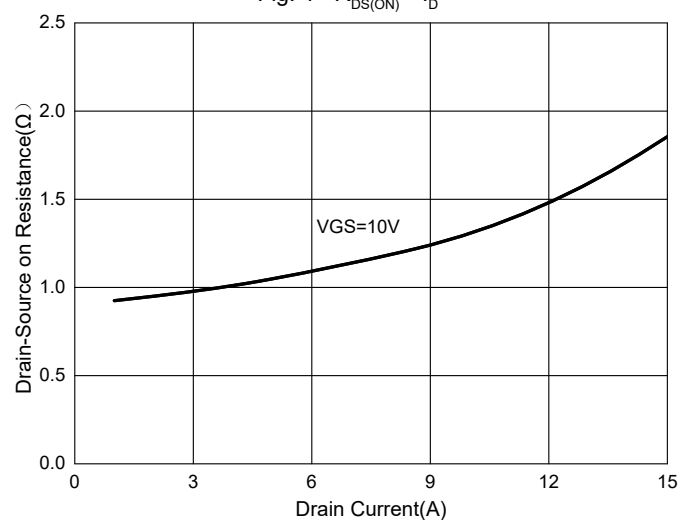


Fig. 5 - Capacitance Characteristics

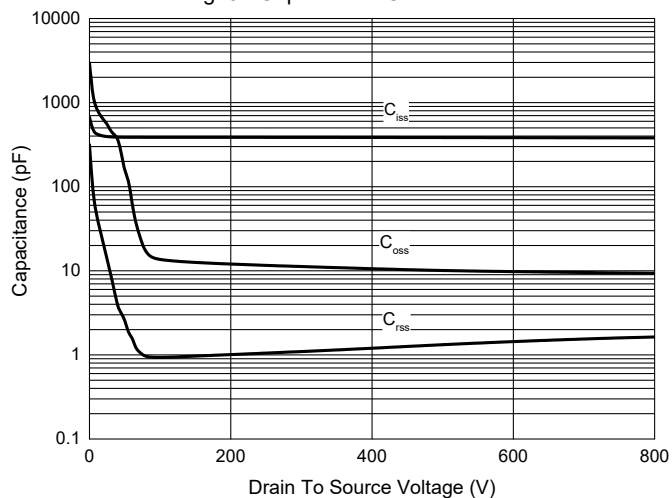
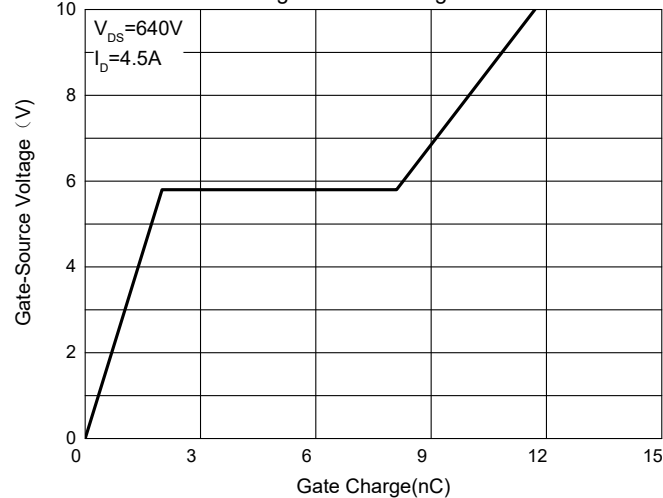


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

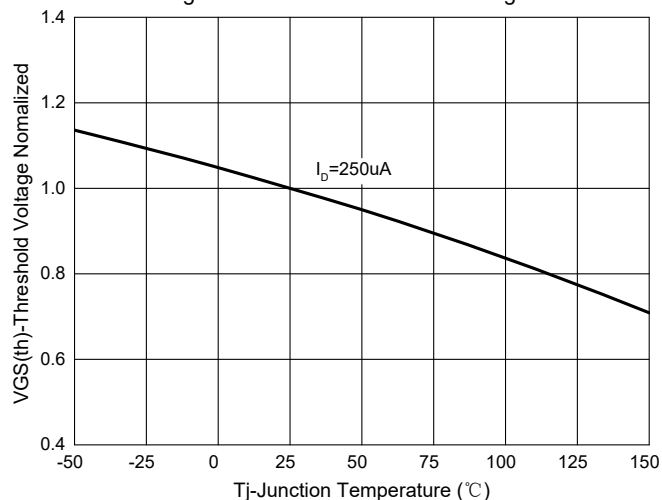


Fig.8-Normalized On Resistance Characteristics

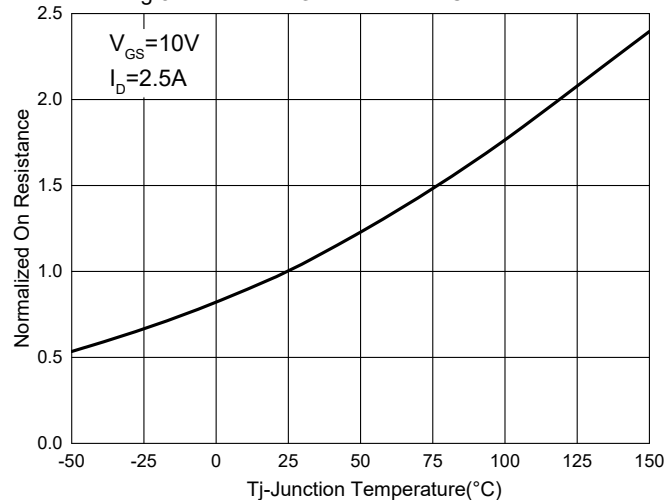


Fig.9 - $I_S - V_{SD}$

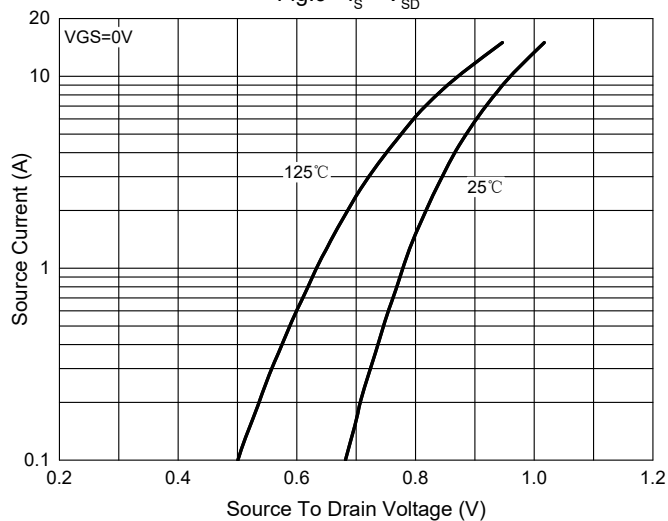


Fig. 10 - Drain Current

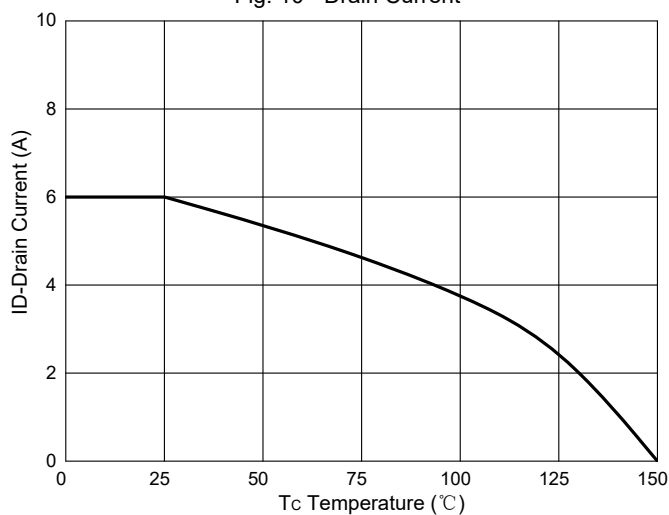
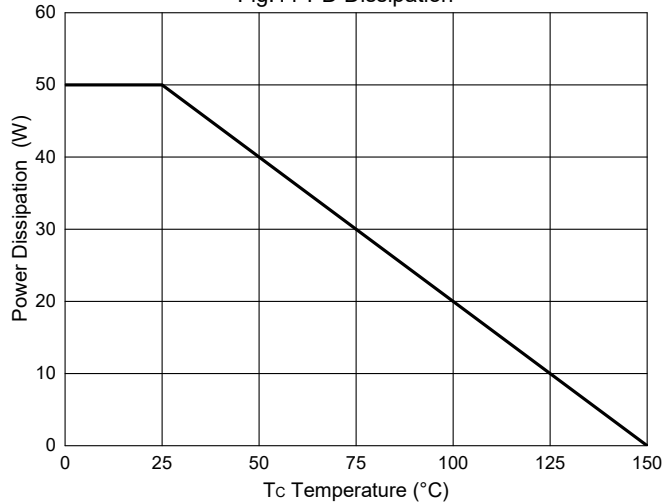


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

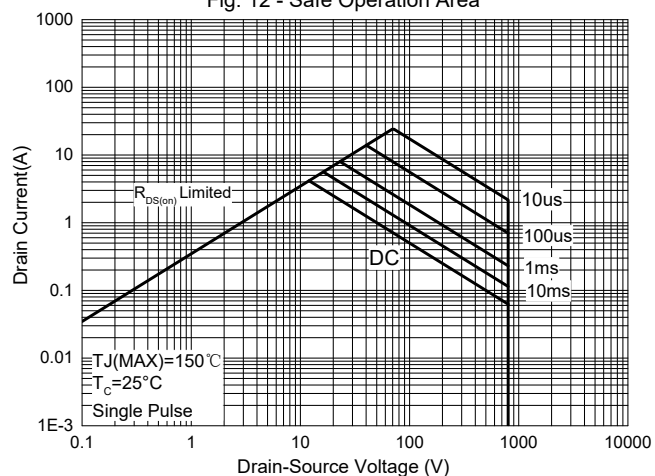
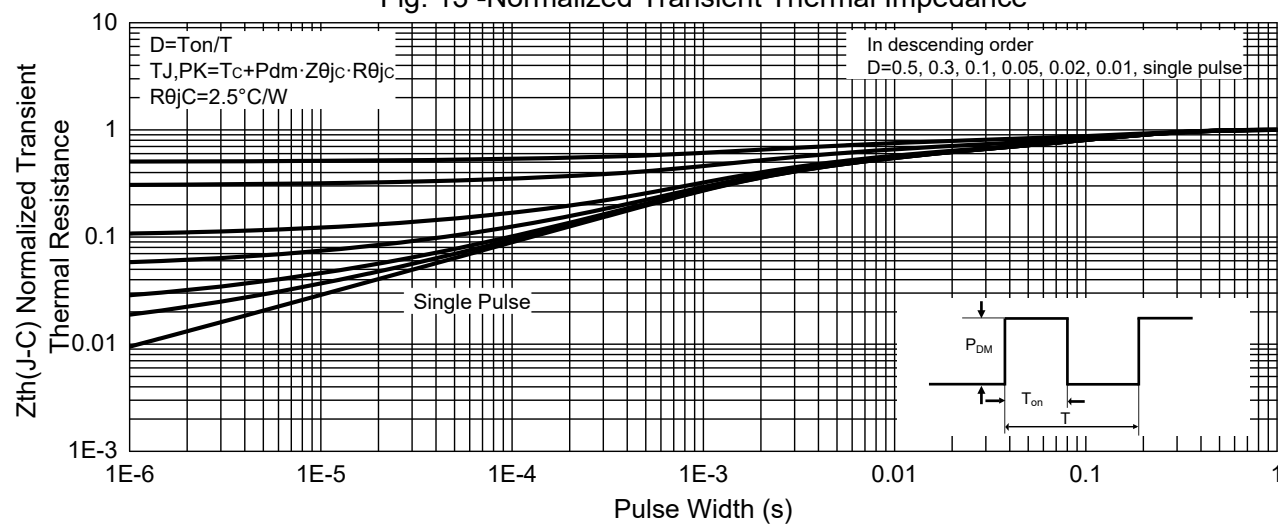


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-BP-HF

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