

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

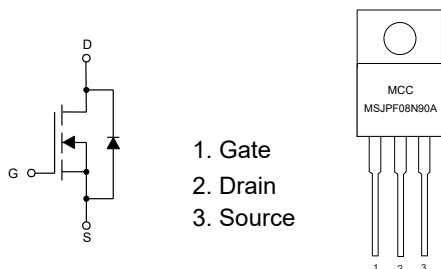
- Operating Junction Temperature Range : -55°C to $+150^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Thermal Resistance: 34°C/W Junction to Ambient^(Note2)
- Thermal Resistance: 1.4°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	900	V
Gate-Source Voltage		V _{GS}	±30	V
Continuous Drain Current	T _C =25°C	I _D	8	A
	T _C =100°C		5	
Pulsed Drain Current ^(Note3)		I _{DM}	32	A
Total Power Dissipation ^(Note4)		P _D	89	W
Single Pulsed Avalanche Energy ^(Note5)		E _{AS}	45	mJ

Note:

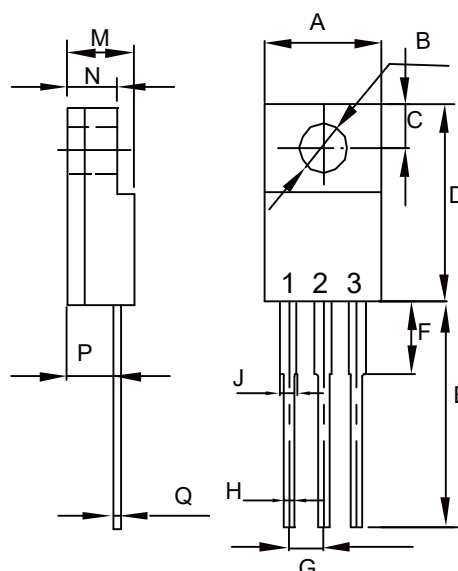
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A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

Internal Structure and Marking Code



N-CHANNEL Super-Junction Power MOSFET

TO-220F



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.381	0.406	9.70	10.30	
B	0.118	0.138	3.00	3.50	Φ
C	0.124	0.139	3.15	3.55	
D	0.610	0.634	15.50	16.10	
E	0.496	0.535	12.60	13.60	
F	0.134	0.150	3.40	3.80	
G	0.092	0.108	2.34	2.74	
H	0.027	0.035	0.70	0.90	
J	0.044	0.056	1.12	1.42	
M	0.173	0.193	4.40	4.90	
N	0.098	0.114	2.50	2.90	
P	0.085	0.100	2.15	2.55	
Q	0.016	0.024	0.40	0.60	

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	900			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =900V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =2.5A		1.05	1.3	Ω
Gate Resistance	R _G	f=1MHz, Open drain		5.2		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				8	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =8A			1.4	V
Reverse Recovery Time	t _{rr}	I _F =5A, di/dt=600A/μs		160		ns
Reverse Recovery Charge	Q _{rr}			2.3		μC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=1MHz		469		pF
Output Capacitance	C _{oss}			17		
Reverse Transfer Capacitance	C _{rss}			1.1		
Total Gate Charge	Q _g	V _{DS} =720V, V _{GS} =10V, I _D =5A		14		nC
Gate-Source Charge	Q _{gs}			2.7		
Gate-Drain Charge	Q _{gd}			6.6		
Turn-On Delay Time	t _{d(on)}	V _{DD} =450V, V _{GS} =10V, R _G =2.2Ω, I _D =5A		23		ns
Turn-On Rise Time	t _r			16		
Turn-Off Delay Time	t _{d(off)}			21		
Turn-Off Fall Time	t _f			27		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

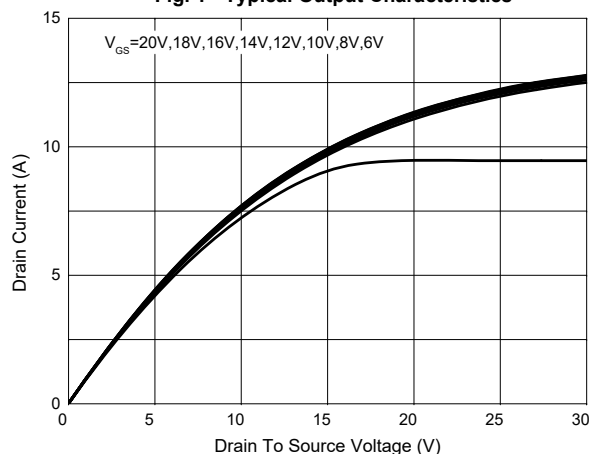


Fig. 2 - Transfer Characteristics

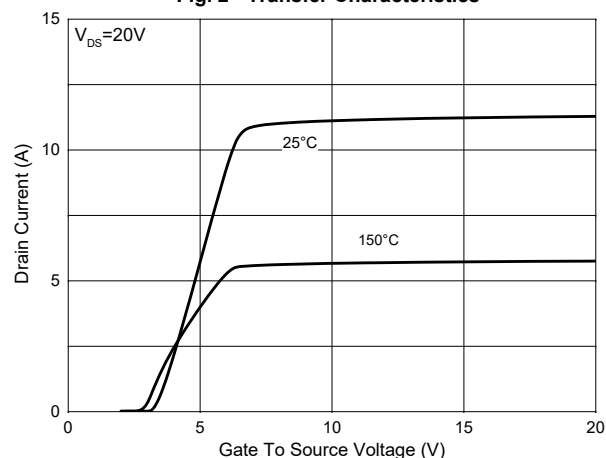


Fig.3 - $R_{DS(ON)}$ - V_{GS}

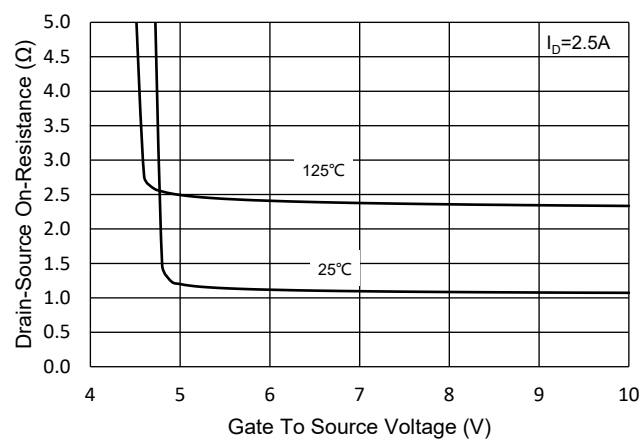


Fig.4 - $R_{DS(ON)}$ - I_D

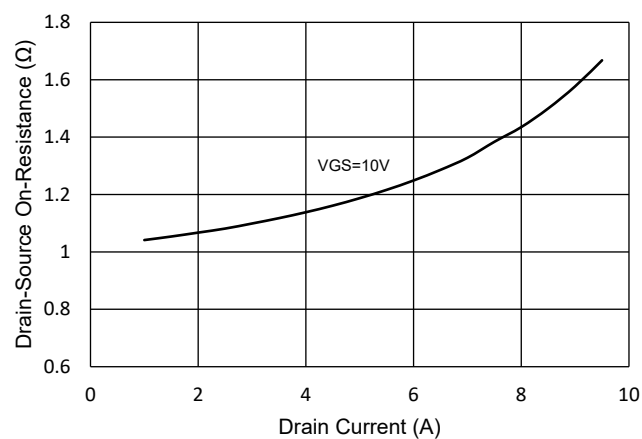


Fig. 5 - Capacitance Characteristics

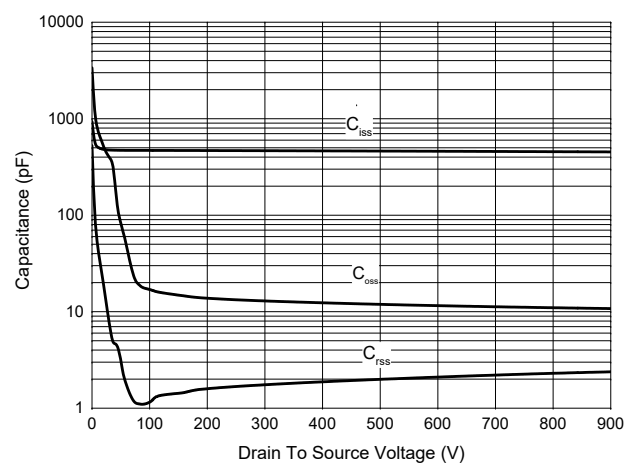
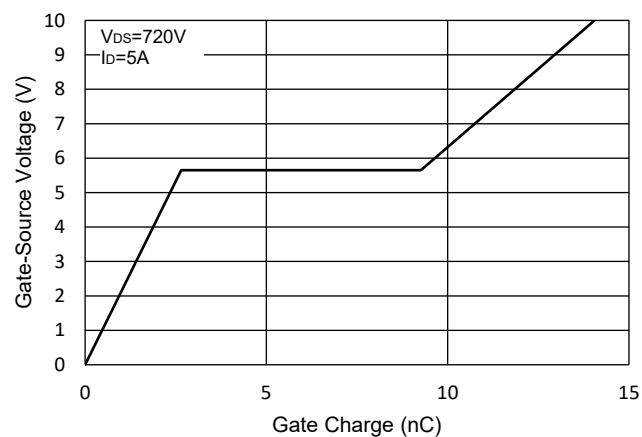


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

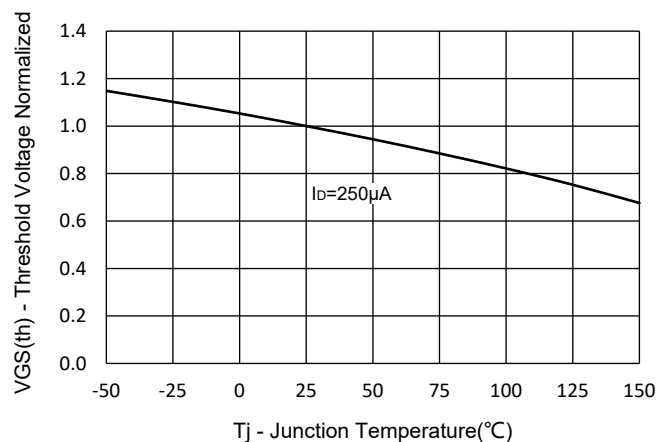


Fig.8 - Normalized On Resistance Characteristics

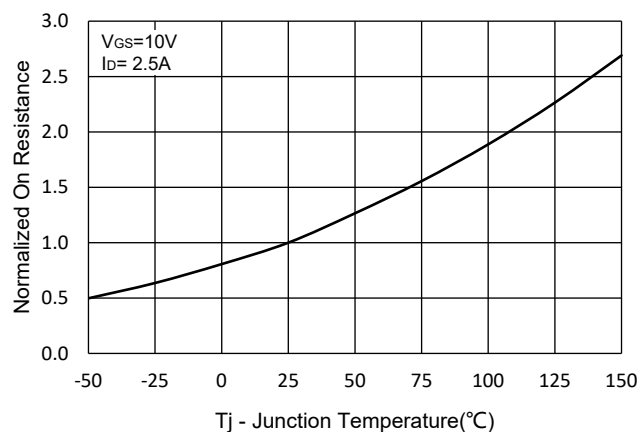


Fig.9 - $I_S - V_{SD}$

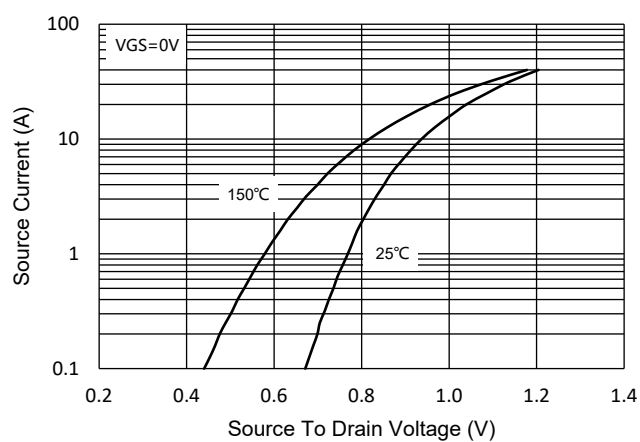


Fig.10 - Drain Current

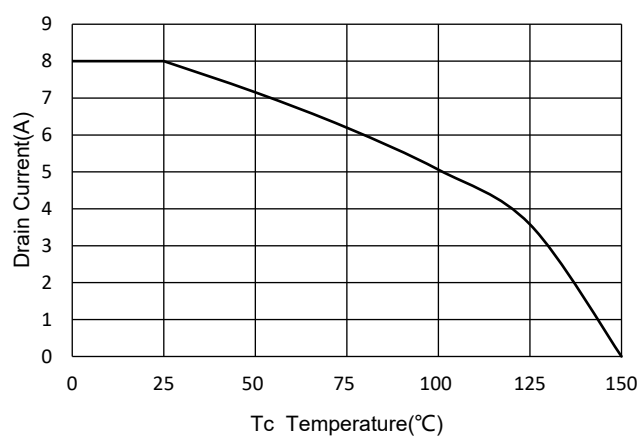
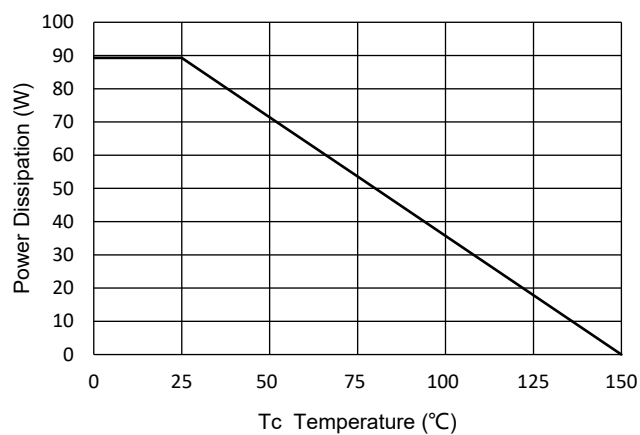


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

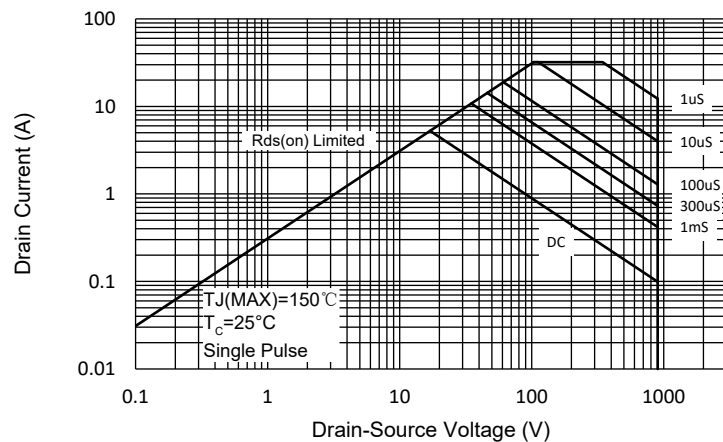
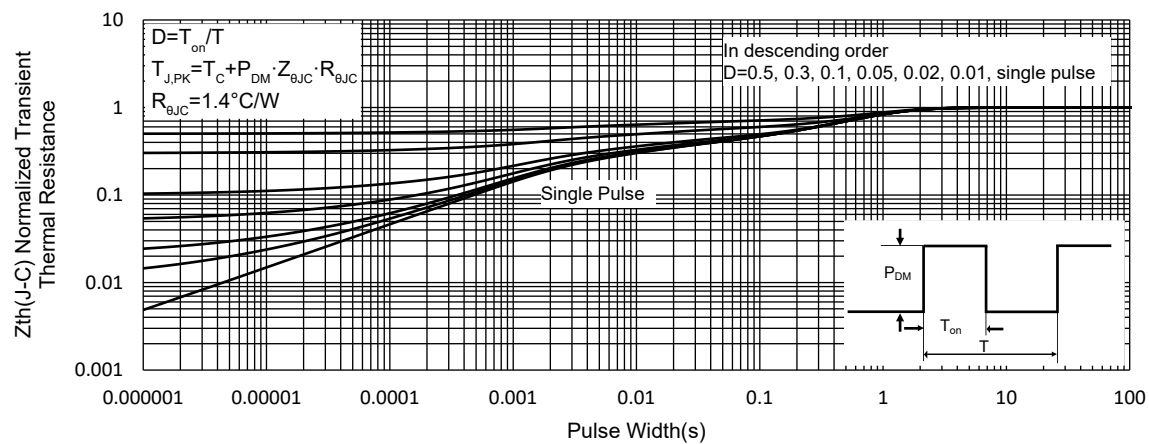


Fig.13 - Normalized Transient Thermal Impedance



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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