N-CHANNEL Super-Junction Power MOSFET

Features

- Very Low FOM $R_{DS(on)} \times Q_g$
- Halogen Free. “Green” Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

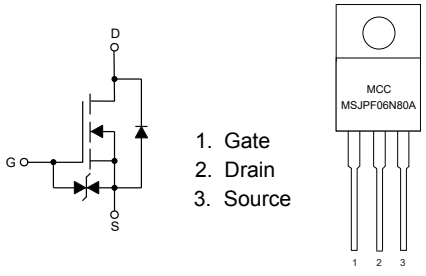
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance:60°C/W Junction to Ambient(Note2)
- Thermal Resistance:2.5°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	800	V
Gate-Source Volltage		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

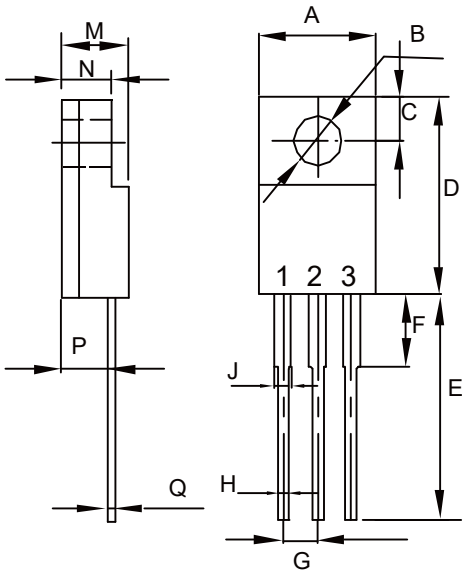
Note:

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 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°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°C, V_{DD}=50V, V_{GS}=10V, L=30mH.

Internal Structure and Marking Code



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

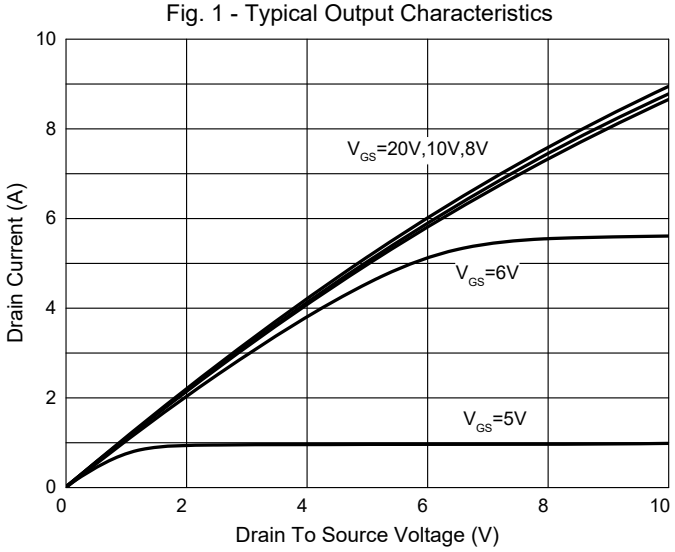


Fig. 2 - Transfer Characteristics

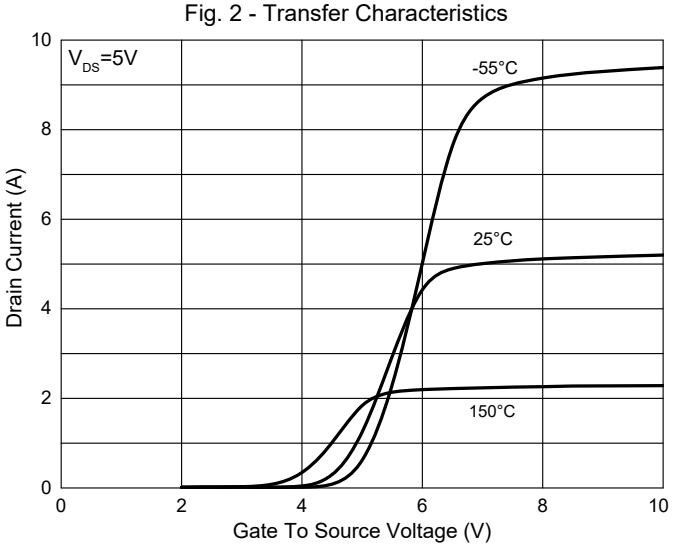


Fig. 3 - $R_{DS(ON)}$—V_{GS}

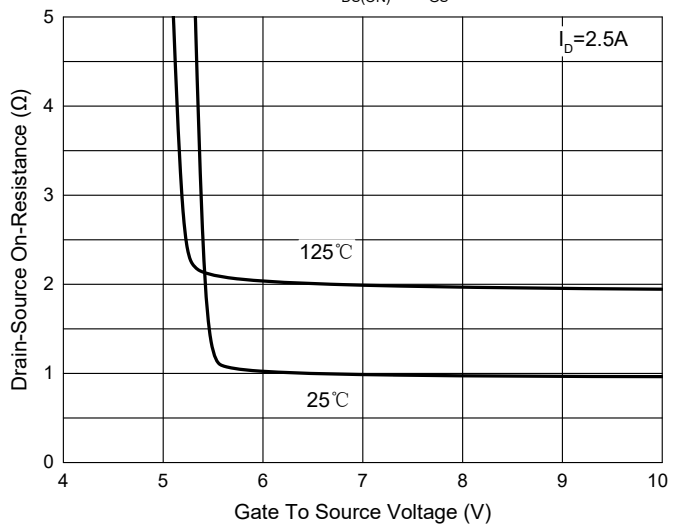


Fig. 4 - $R_{DS(ON)}$—I_D

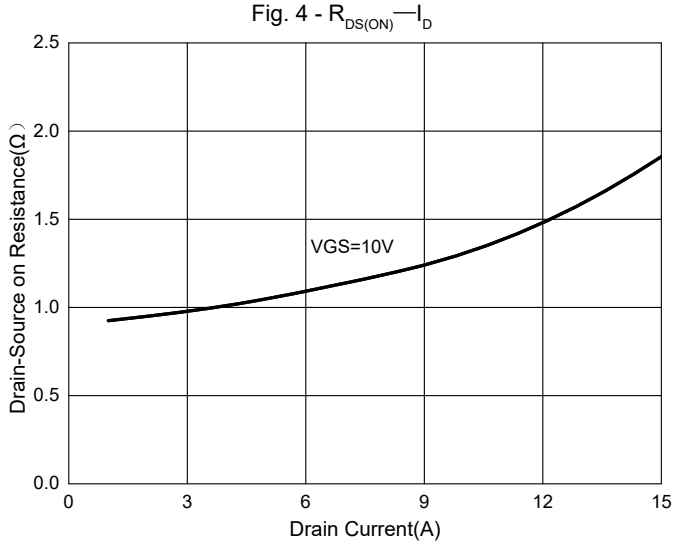


Fig. 5 - Capacitance Characteristics

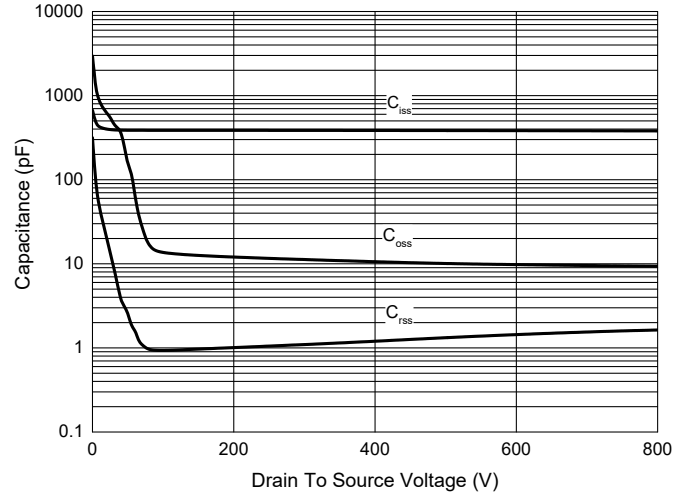
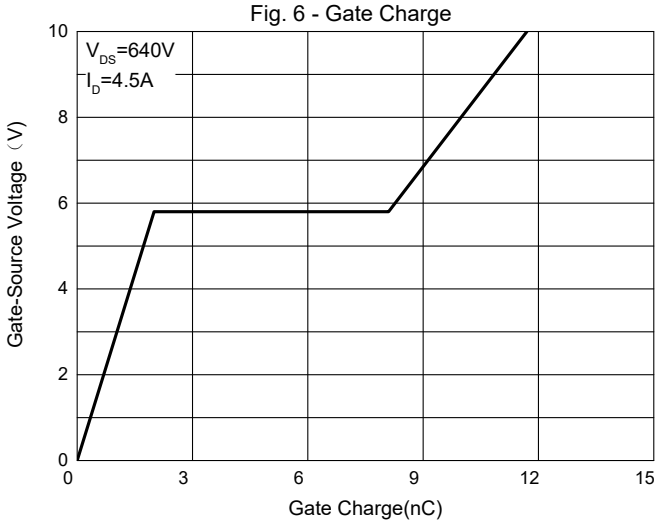


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Nomalized Threshold Voltage

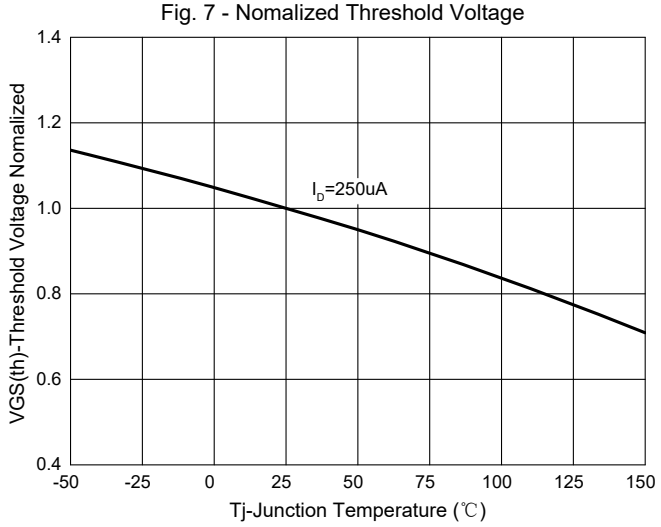


Fig.8-Normalized On Resistance Characteristics

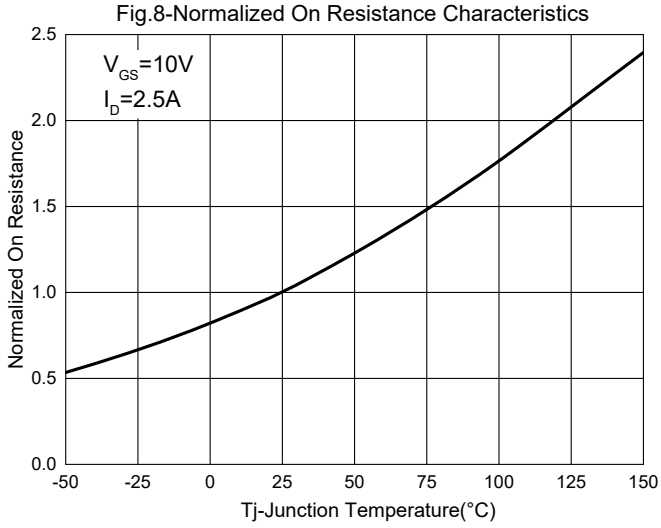


Fig.9 - I_S—V_{SD}

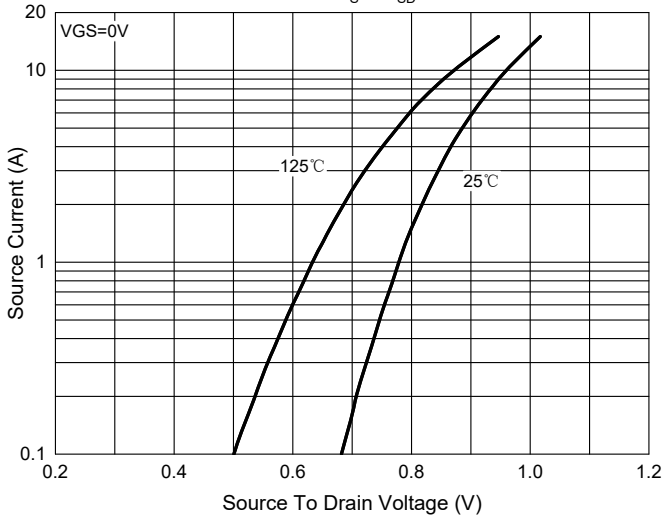


Fig. 10 - Drain Current

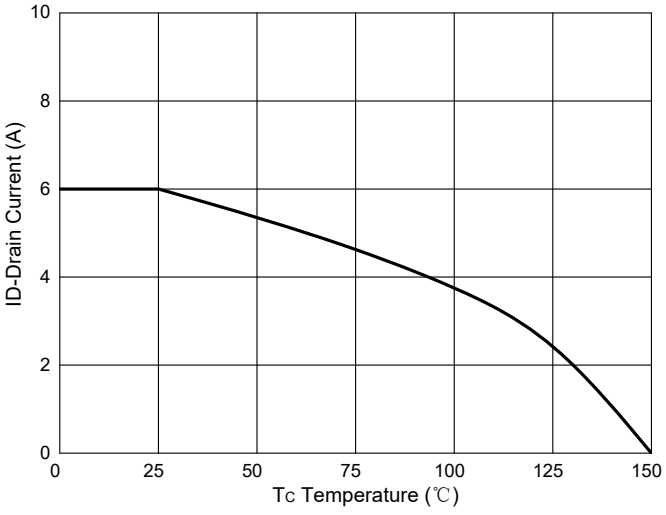
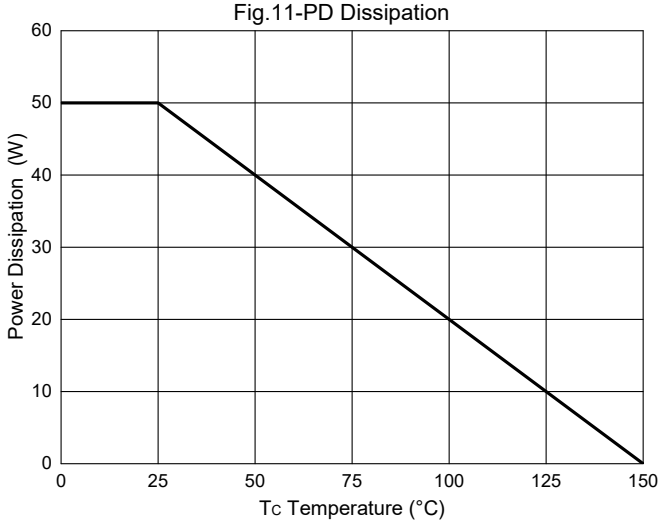


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

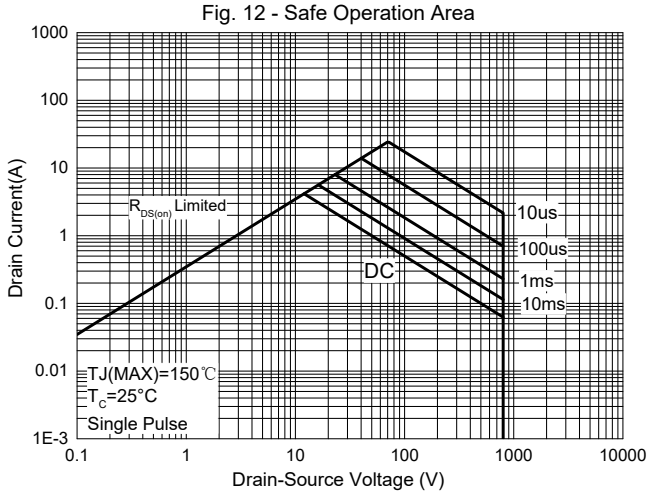
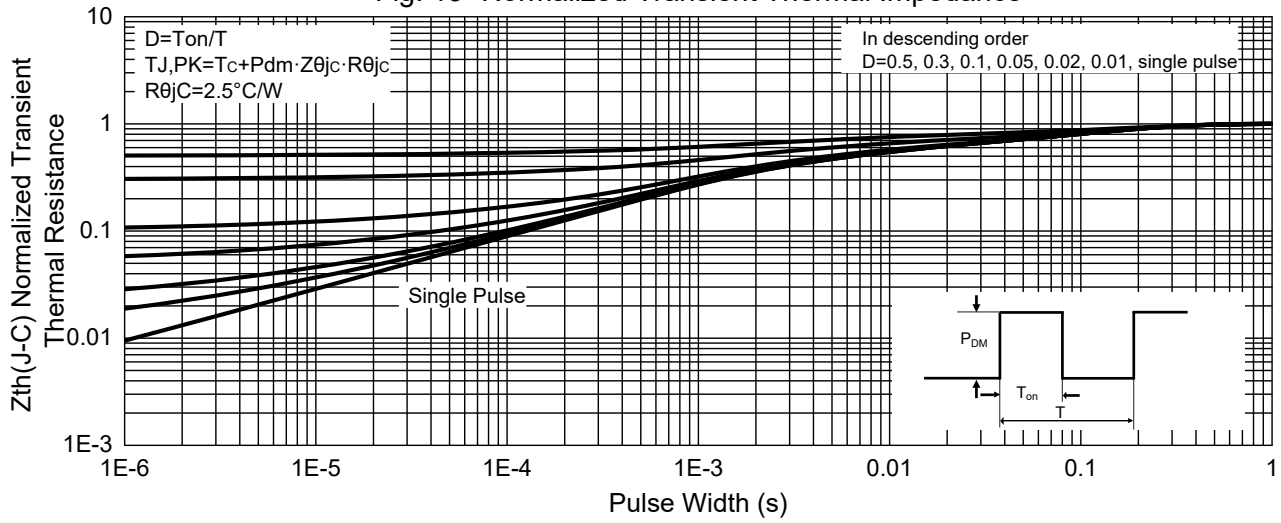


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

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

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