Features

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

N-CHANNEL Super-Junction Power MOSFET

Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 75°C/W Junction to Ambient
- Thermal Resistance: 4.0°C/W Junction to Case

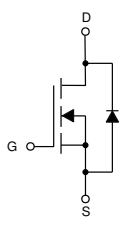
Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Volltage		V_{GS}	±30	V
Continuous Drain Current		I_D	11	A
Pulsed Drain Current (Note 2)		I_{DM}	45	A
Single Pulse Avalanche Energy (Note 3)		E_{AS}	215	mJ
Avalanche Current (Note 2)		I_{AR}	1.6	A
Repetitive Avalanche Energy (Note 2)		E_{AR}	0.32	mJ
Total Power Dissipation	T_C=25°C	P_D	31.3	W

Note: 1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

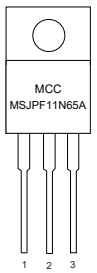
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

3. V_{DD}=50V, R_G=25Ω, Starting T_J=25°C .

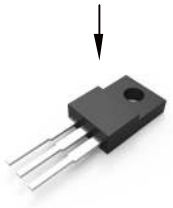
Internal Structure and Marking Code



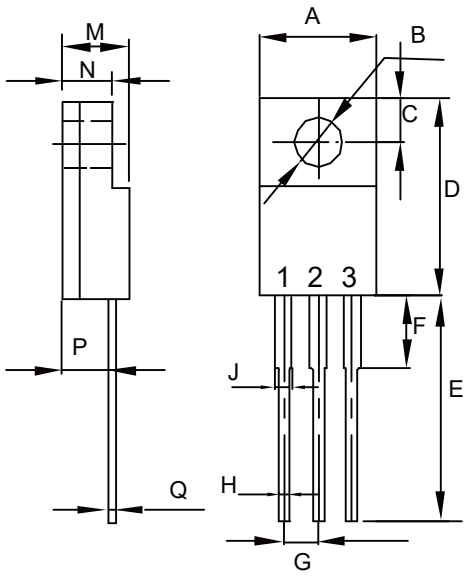
1. Gate
2. Drain
3. Source



Plastic



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	650			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±30V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V			1	μA
		V_{DS}=650V, V_{GS}=0V, T_J=150°C			100	
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2		4	V
Drain-Source On-Resistance(Note 4)	$R_{DS(on)}$	V_{GS}=10V, I_D=3.2A		0.34	0.38	Ω
Forward tranconductance(Note 4)	g_{FS}	V_{DS}=10V, I_D=3.2A		7.8		S
Dynamic Characteristics(Note 5)						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHz		763		pF
Output Capacitance	C_{oss}			896		
Reverse Transfer Capacitance	C_{rss}			39		
Total Gate Charge	Q_g	V_{DD}=520V,V_{GS}=10V,I_D=11A		21		nC
Gate-Source Charge	Q_{gs}			5.3		
Gate-Drain Charge	Q_{gd}			7.5		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} =325V, I_D=11A,R_G=25Ω		19		ns
Turn-On Rise Time	t_r			38		
Turn-Off Delay Time	$t_{d(off)}$			108		
Turn-Off Fall Time	t_f			36		
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C=25°C			11	A
Pulsed Diode Forward Current	I_{SM}				33	
Body Diode Voltage	V_{SD}	I_{SD}=11A, V_{GS}=0V			1.4	V
Reverse Recovery Time	t_{rr}	V_R=520V, I_F=I_S,di_F/dt=100A/μs		324		ns
Reverse Recovery Charge	Q_{rr}			3.8		μC
Peak Reverse Recovery Current	I_{rrm}			23		A

Note 4. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 1%.

5. Guaranteed by Design, Not Subject to Production Testing.

Curve Characteristics

Fig. 1 - Typical Output Characteristics

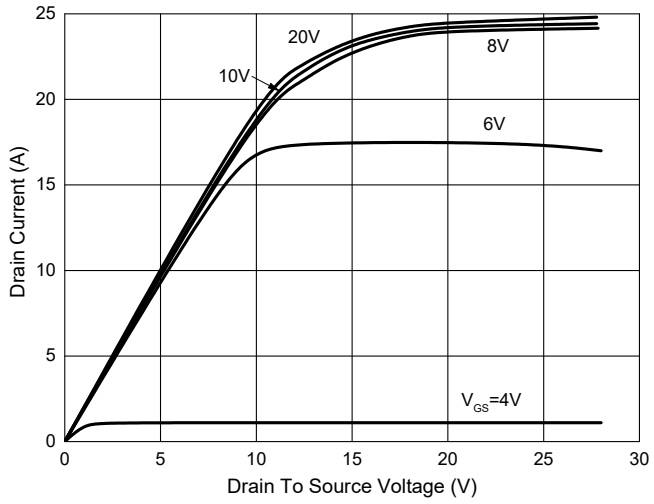


Fig. 2 - Transfer Characteristics

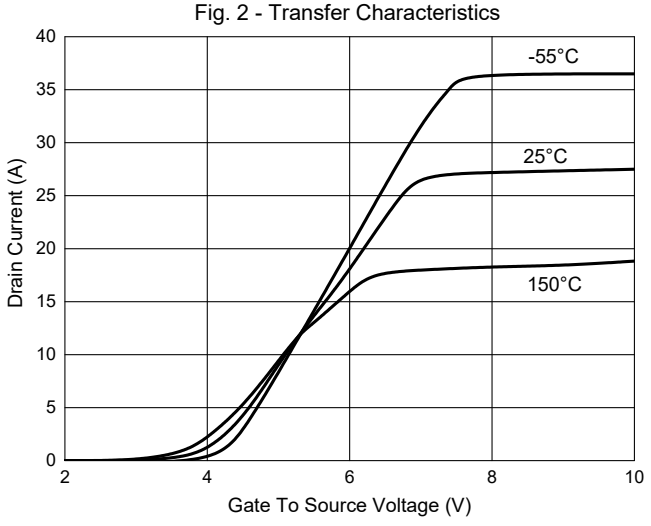


Fig. 3 - $R_{DS(ON)}$—I_D

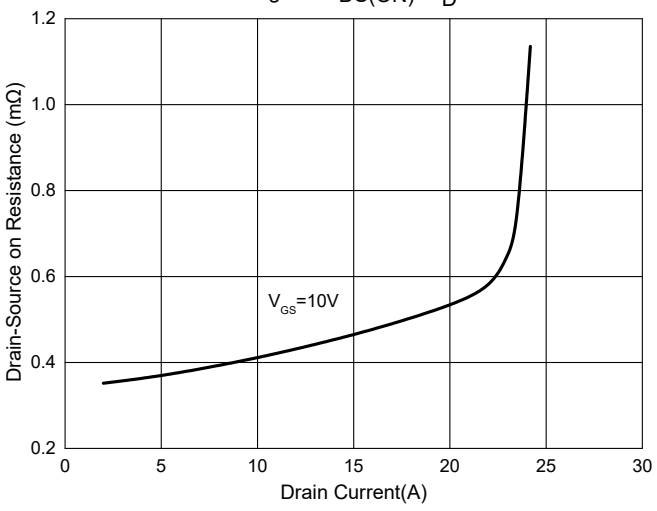


Fig. 4 - Normalized On Resistance Characteristics

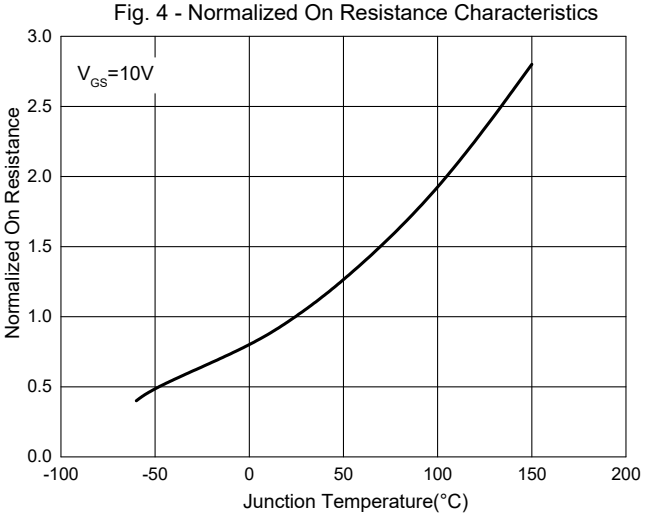


Fig. 5 - Gate Charge

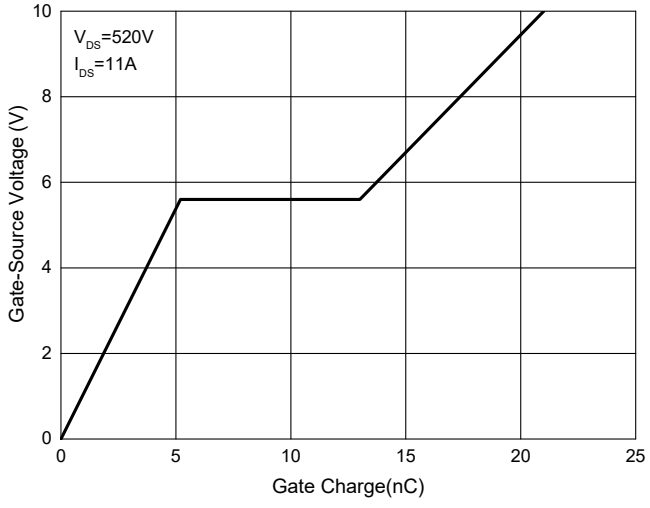


Fig. 6 - Capacitance Characteristics

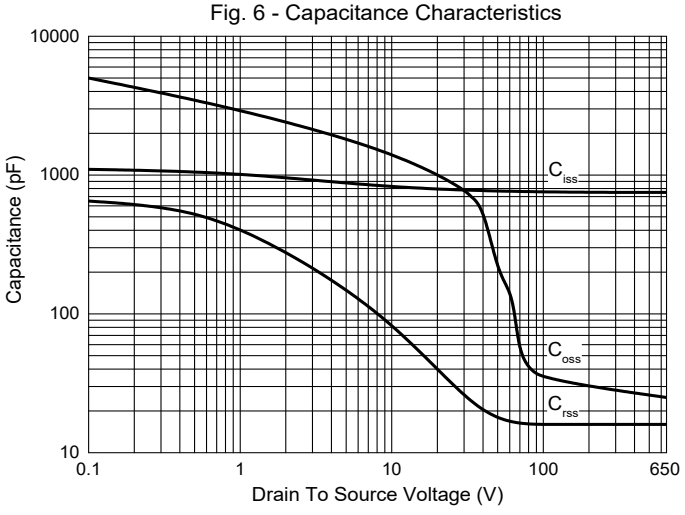


Fig. 7 - Normalized Drain-Source Breakdown Voltage

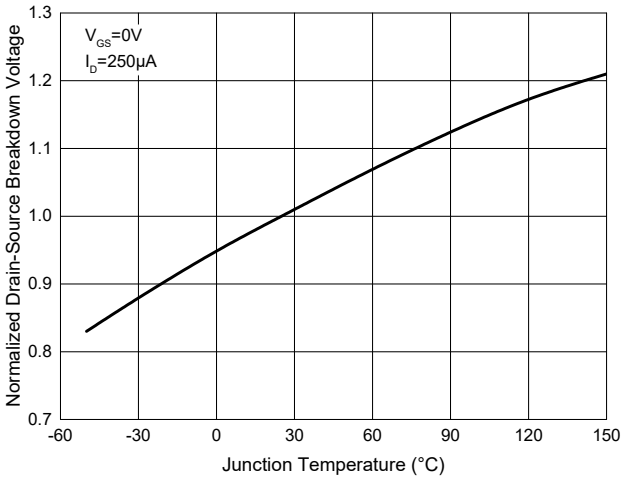


Fig. 8 - Safe Operation Area

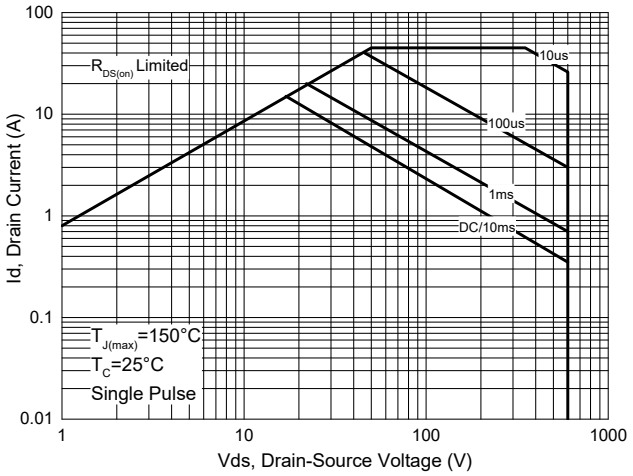
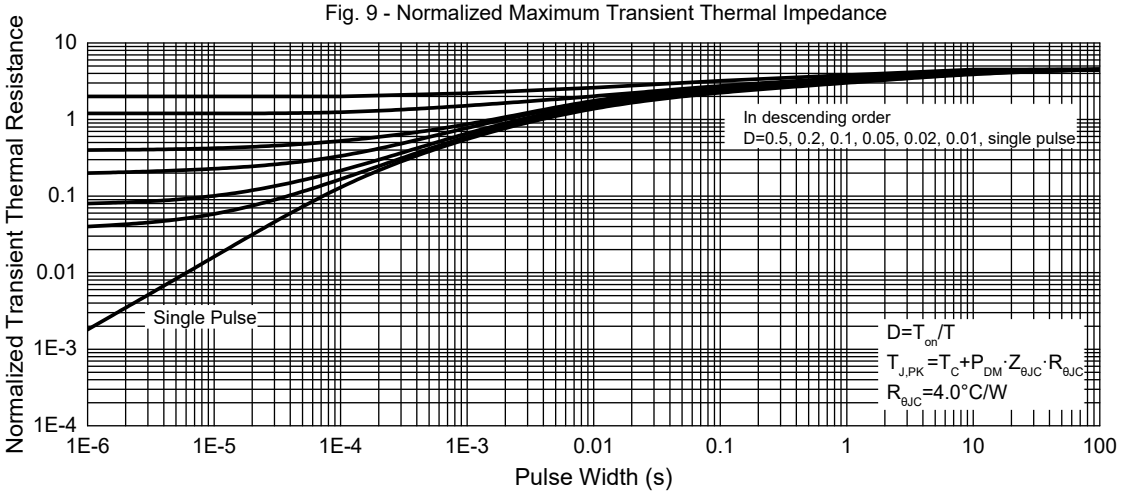


Fig. 9 - Normalized Maximum Transient Thermal Impedance



Ordering Information

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