

### Features

- High Current Rating
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

### Maximum Ratings

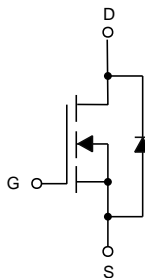
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 2.5°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Continuous Drain Current @ 25°C	$I_D$	7	A
Continuous Drain Current @ 100°C	$I_D$	4.2	A
Pulsed Drain Current <sup>(Note1)</sup>	$I_{DM}$	28	A
Gate-Source Voltage	$V_{GS}$	±30	V
Single Pulse Avalanche <sup>(Note2)</sup>	$E_{AS}$	220	mJ
Pulsed Avalanche Rating <sup>(Note2)</sup>	$I_{AS}$	7	A
Power Dissipation	$P_D$	50	W

Note 1. Pulse Width Limited by Maximum Junction Temperature.

2.  $V_{DD}=50V, V_{DS}=650V, R_G=25\Omega, T_J=25^\circ C$ .

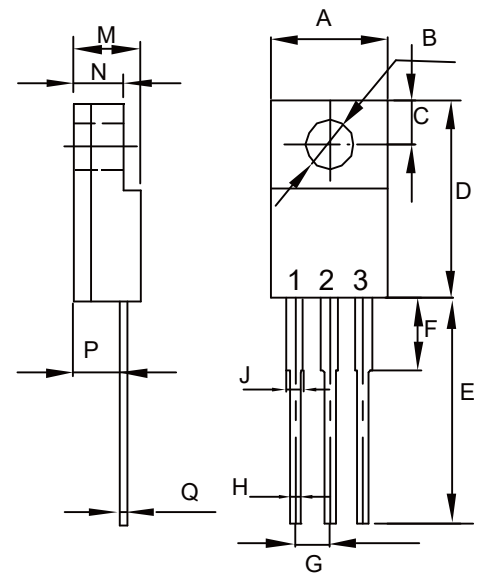
### Internal Structure



1. Gate
2. Drain
3. Source

## N-CHANNEL MOSFET

### TO-220F



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	650			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 30V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ C$			1	$\mu A$
		$V_{DS}=650V, V_{GS}=0V, T_J=150^\circ C$			10	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5		4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.5A$		1.15	1.4	$\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		1600		pF
Output Capacitance	$C_{oss}$			85		
Reverse Transfer Capacitance	$C_{rss}$			3.5		
Total Gate Charge	$Q_g$	$V_{DD}=520V, V_{GS}=10V, I_D=7A$		26		nC
Gate-Source Charge	$Q_{gs}$			10.5		
Gate-Drain Charge	$Q_{gd}$			7.1		
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Maximum Body-Diode Continuous Current	$I_S$				7	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=I_S$			1.5	V

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

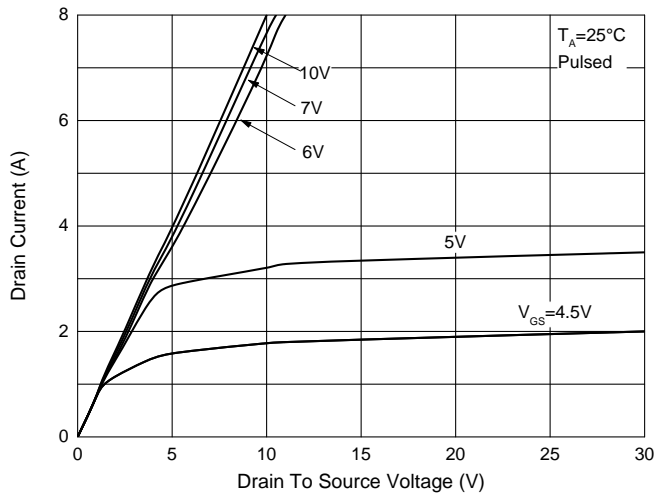


Fig. 2 - Drain-Source On-Resistance Characteristics

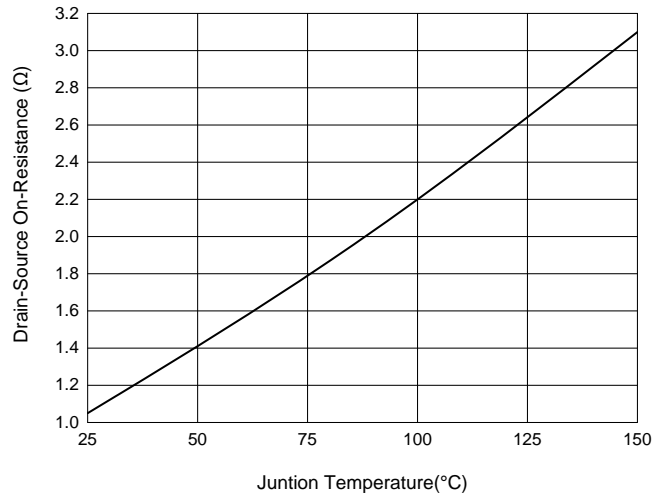


Fig. 3 - Drain-Source Breakdown Voltage Characteristics

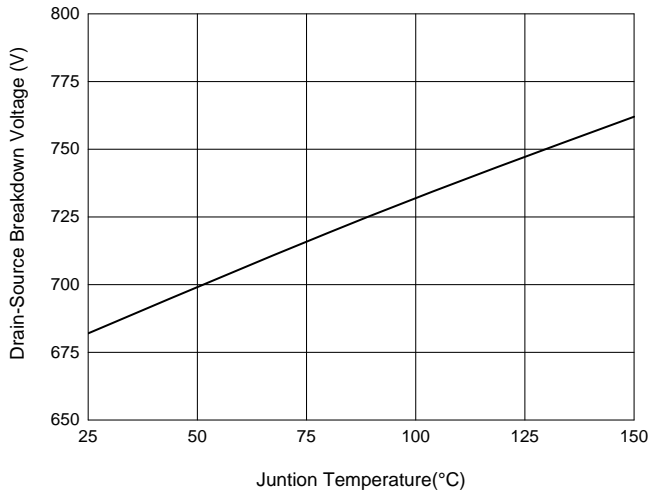


Fig. 4 - Drain Current Characteristics

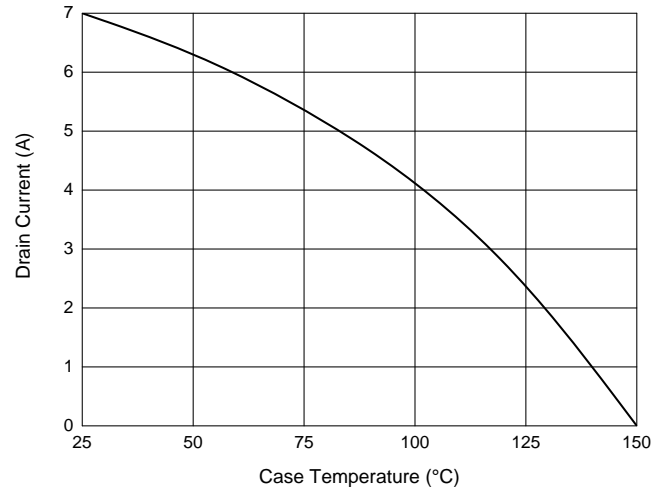


Fig. 5 - Total Gate Charge Characteristics

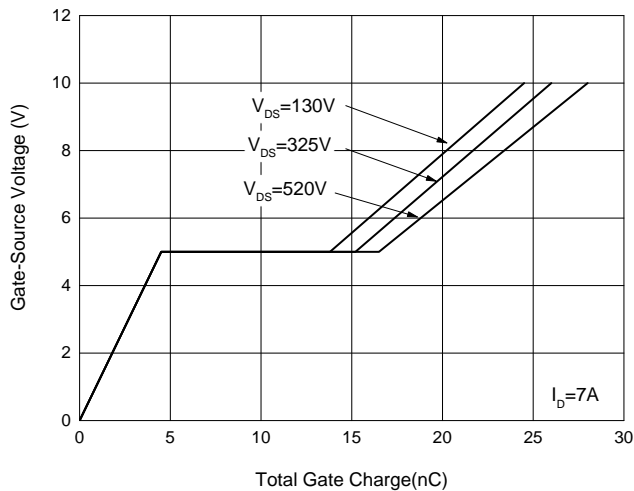
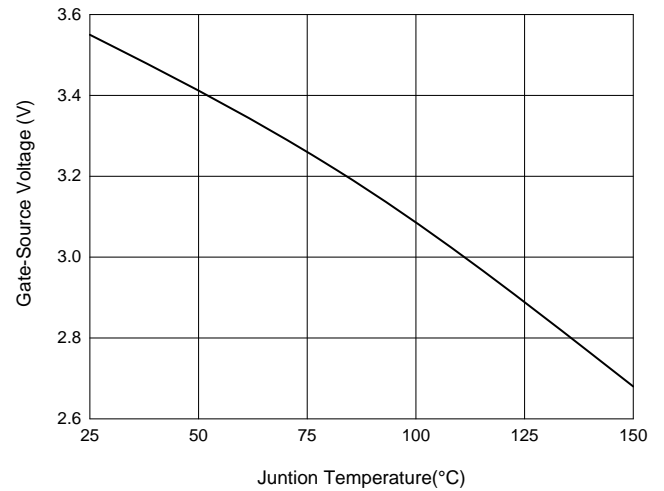


Fig. 6 - Gate-Source Voltage Characteristics



## Ordering Information

Device	Packing
Part Number-BP	Bulk: 1Kpcs/Box

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

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