

### Features

- Excellent Stability and Uniformity
- Lower  $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1

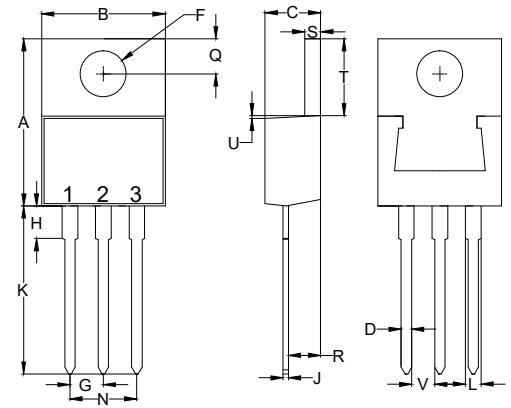
### Maximum Ratings

- Operating Junction Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Storage Temperature Range:  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- Thermal Resistance:  $62^{\circ}\text{C/W}$  Junction to Ambient

Parameter	Symbol	Rating	Unit
Drain -Source Voltage	$V_{DS}$	800	V
Gate -Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current-Continuous	$I_D$	4.0	A
Drain Current-Pulse <sup>(Note1)</sup>	$I_{DM}$	12	A
Power Dissipation	$P_D$	63	W
Single Pulsed Avalanche Energy <sup>(Note2)</sup>	$E_{AS}$	162	mJ
Repetitive Avalanche Energy <sup>(Note1)</sup>	$E_{AR}$	0.2	mJ

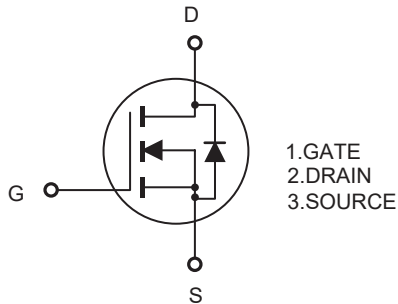
# N-Channel Enhancement Mode Field Effect Transistor

## TO-220



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.560	0.625	14.22	15.88	
B	0.380	0.420	9.65	10.67	
C	0.140	0.190	3.56	4.82	
D	0.020	0.045	0.51	1.14	
F	0.139	0.161	3.53	4.09	$\Phi$
G	0.090	0.110	2.29	2.79	
H	-----	0.250	-----	6.35	
J	0.012	0.025	0.30	0.64	
K	0.500	0.580	12.70	14.73	
L	0.045	0.060	1.14	1.52	
N	0.190	0.210	4.83	5.33	
Q	0.100	0.135	2.54	3.43	
R	0.080	0.115	2.04	2.92	
S	0.045	0.055	1.14	1.39	
T	0.230	0.270	5.84	6.86	
U	-----	0.050	-----	1.27	
V	0.045	-----	1.15	-----	

### Internal Structure



**Electrical Characteristics @ 25°C (Unless Otherwise Noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	800			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V, T_J=25^\circ C$			1	$\mu A$
		$V_{DS}=800V, V_{GS}=0V, T_J=150^\circ C$			100	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5		4.5	V
Drain-Source On-Resistance <sup>(Note3)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=2A$		1	1.2	$\Omega$
Forward Transconductance <sup>(Note 3)</sup>	$g_{FS}$	$V_{DS}=10V, I_D=2A$		5		S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		598		$\mu F$
Output Capacitance	$C_{oss}$			30		
Reverse Transfer Capacitance	$C_{rss}$			4		
Total Gate Charge	$Q_g$	$V_{DD}=640V, V_{GS}=10V, I_D=4A$		13		nC
Gate-Source Charge	$Q_{gs}$			4.5		
Gate-Drain Charge	$Q_{gd}$			3		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, I_D=4A, R_G=25\Omega$		39		ns
Turn-On Rise Time	$t_r$			25		
Turn-Off Delay Time	$t_{d(off)}$			100		
Turn-Off Fall Time	$t_f$			18		
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C=25^\circ C$			4	A
Pulsed Diode Forward Current	$I_{SM}$				12	
Body Diode Voltage	$V_{SD}$	$T_J=25^\circ C, I_{SD}=4A, V_{GS}=0V$		0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=400V, I_F=I_S, di_F/dt=100A/\mu s$		250		ns
Reverse Recovery Charge	$Q_{rr}$				2.1	$\mu C$
Peak Reverse Recovery Current	$I_{rrm}$				16	A

**Notes:**

1. Pulse Width Limited by Maximum Junction Temperature.
2.  $L=20mH, I_L=4A, V_{DD}=50V, V_{GS}=10V, R_G=25\Omega, Starting T_J=25^\circ C$
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

## Curve Characteristics

Fig. 1 - Output Characteristics

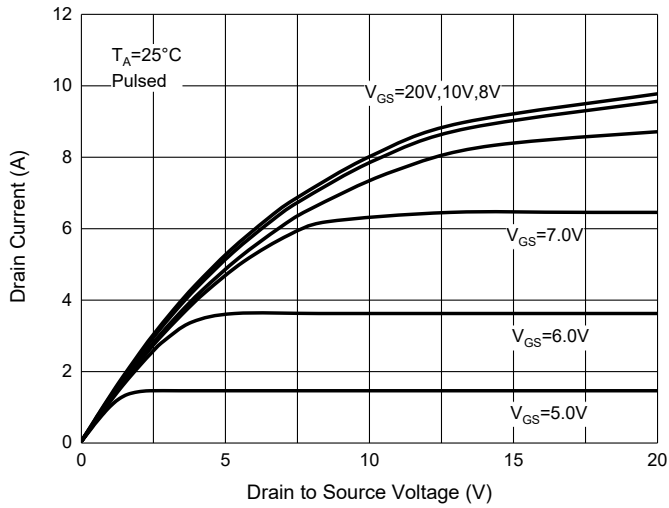


Fig. 2 - Transfer Characteristics

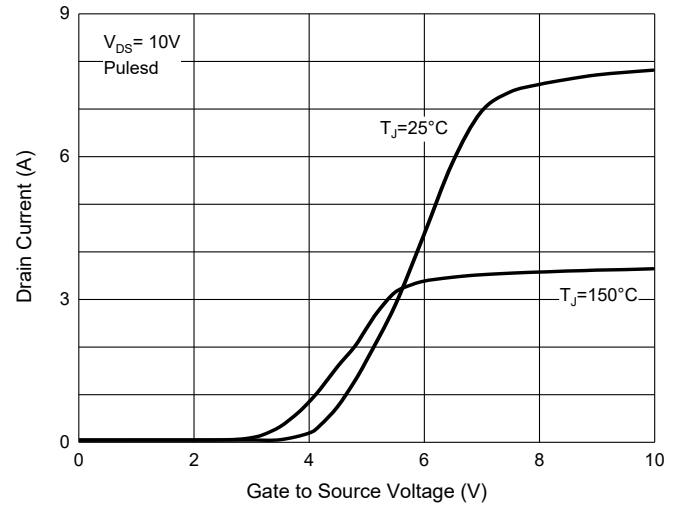


Fig. 3 -  $R_{DS(ON)} - I_D$

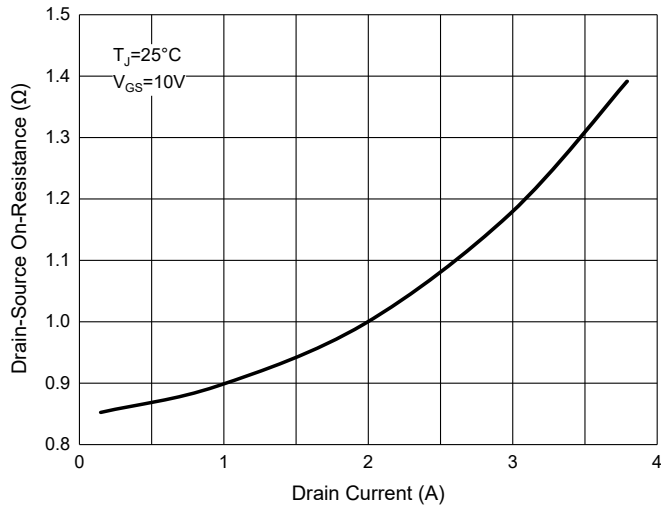


Fig. 4 -  $I_S - V_{SD}$

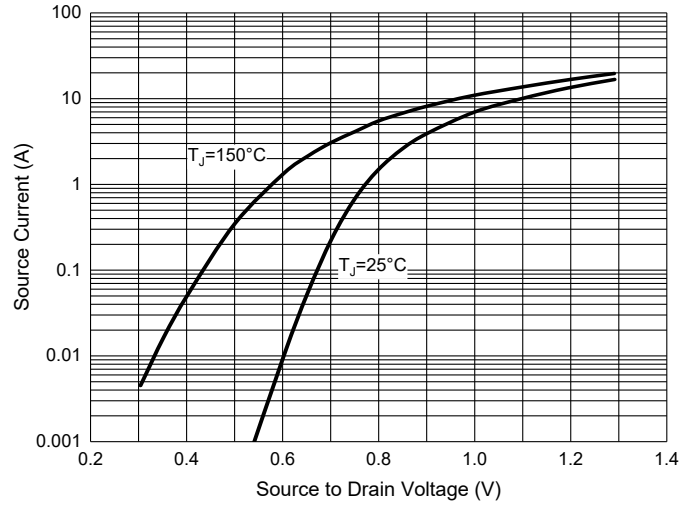


Fig. 5 -  $R_{DS(ON)} - \text{Temperature}$

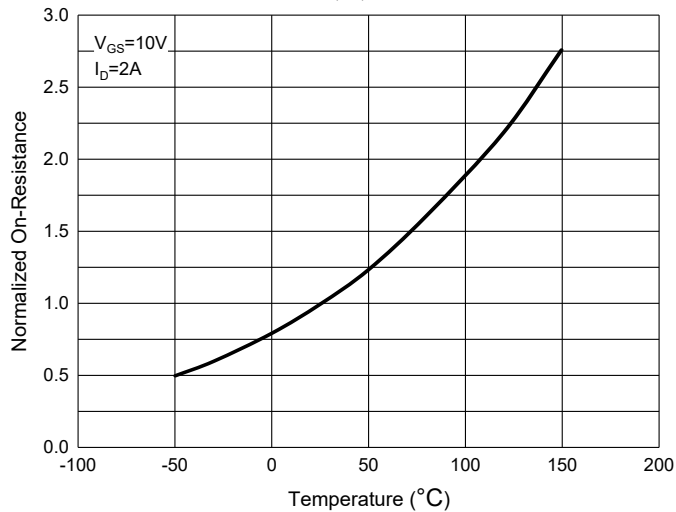
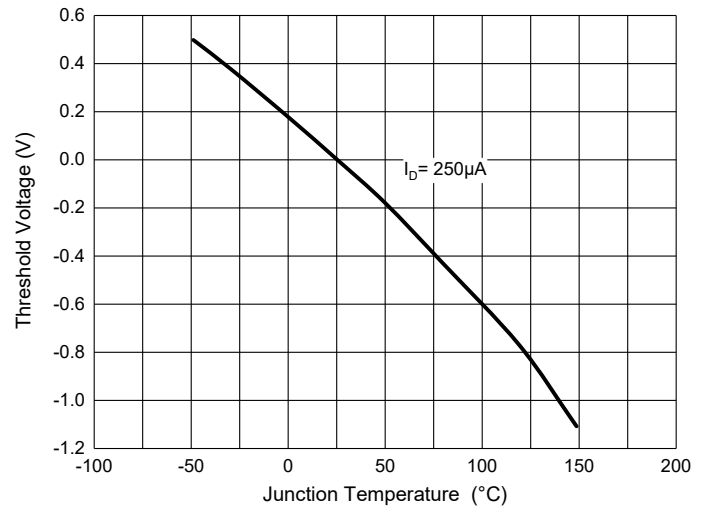


Fig. 6 - Threshold Voltage — Temperature



## 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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