

**Features**

- Fast Switching
- Improved dv/dt Capability
- 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**

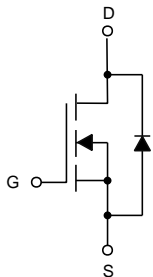
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 62.5°C/W Junction to Ambient
- Thermal Resistance: 5°C/W Junction to Case<sup>(Note 1)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V <sub>DS</sub>	800	V
Gate-Source Voltage	V <sub>GS</sub>	±30	V
Continuous Drain Current	I <sub>D</sub>	5	A
Pulsed Drain Current <sup>(Note1)</sup>	I <sub>DM</sub>	20	A
Single Pulse Avalanche Energy <sup>(Note 2)</sup>	E <sub>AS</sub>	151	mJ
Avalanche Current <sup>(Note1)</sup>	I <sub>AS</sub>	5.5	A
Repetitive Avalanche Energy <sup>(Note1)</sup>	E <sub>AR</sub>	90	mJ
Total Power Dissipation	P <sub>D</sub>	25	W

Note: 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2.I<sub>AS</sub>=3A, V<sub>DD</sub>=50V, R<sub>G</sub>=25 Ω, Starting T<sub>J</sub>=25°C.

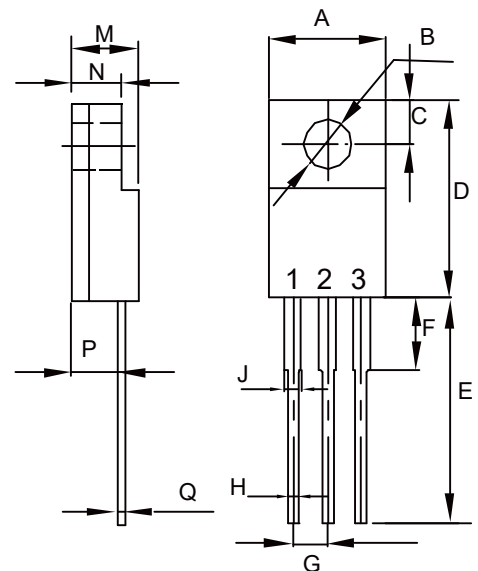
**Internal Structure**



1. Gate
2. Drain
3. Source

**N-CHANNEL  
MOSFET**

**TO-220F**



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
<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	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 30V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V$			1	$\mu A$
		$V_{DS}=640V, V_{GS}=0V, T_J=25^\circ C$			100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3		4	V
Drain-Source On-Resistance <sup>(Note 3)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=2.5A$		2.3	2.8	$\Omega$
<b>Dynamic Characteristics<sup>(Note 4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		667		$\mu F$
Output Capacitance	$C_{oss}$			77		
Reverse Transfer Capacitance	$C_{rss}$			14		
Total Gate Charge	$Q_g$	$V_{DD}=640V, V_{GS}=10V, I_D=5A$		27		nC
Gate-Source Charge	$Q_{gs}$			3.5		
Gate-Drain Charge	$Q_{gd}$			13		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, I_D=5A, R_G=25\Omega$		37		ns
Turn-On Rise Time	$t_r$			15		
Turn-Off Delay Time	$t_{d(off)}$			144		
Turn-Off Fall Time	$t_f$			41		
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C=25^\circ C$			5	A
Pulsed Diode Forward Current	$I_{SM}$				20	
Body Diode Voltage	$V_{SD}$	$I_{SD}=2.5A, V_{GS}=0V$			1.4	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=5A, di_F/dt=100A/\mu s$		1099		ns
Reverse Recovery Charge	$Q_{rr}$				3.2	$\mu C$

Note 3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$ .

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

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

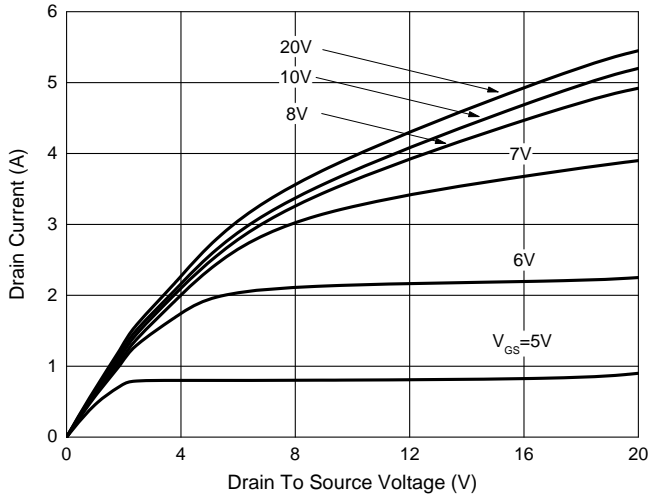


Fig. 2 - Transfer Characteristics

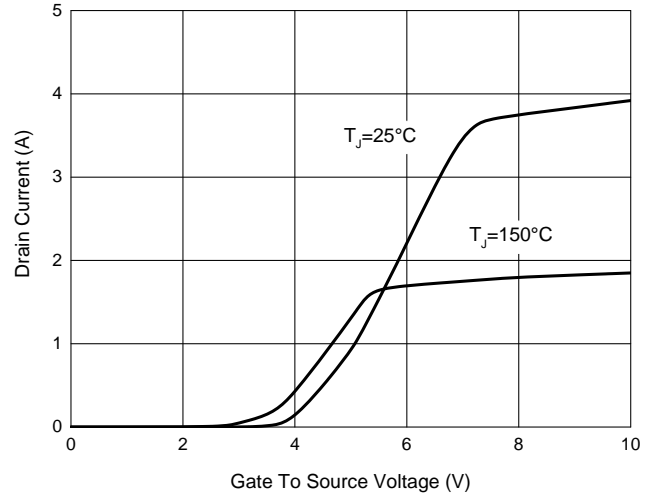


Fig. 3 - Capacitance Characteristics

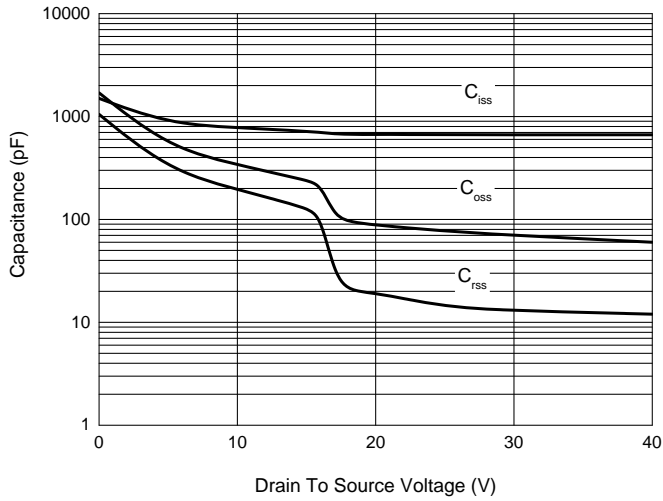


Fig. 4 - Gate Charge Characteristics

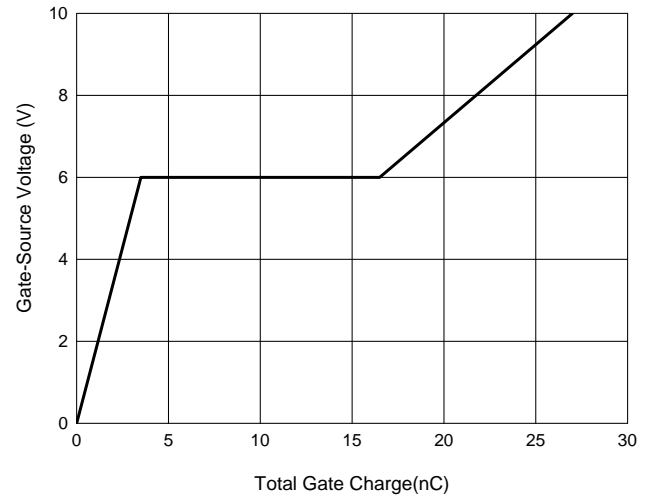


Fig. 5 -  $I_s - V_{SD}$

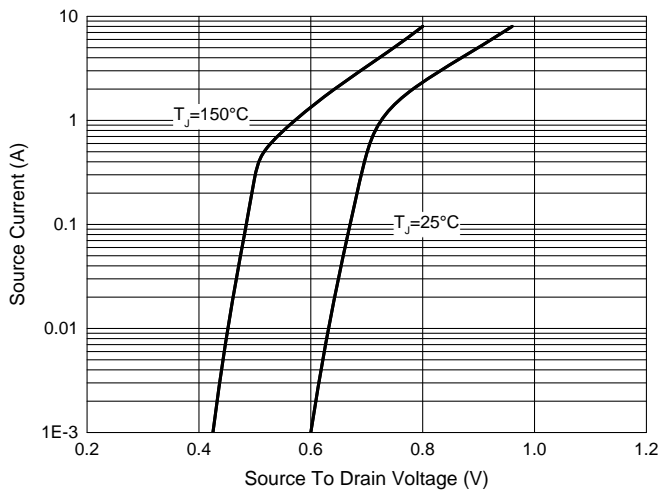
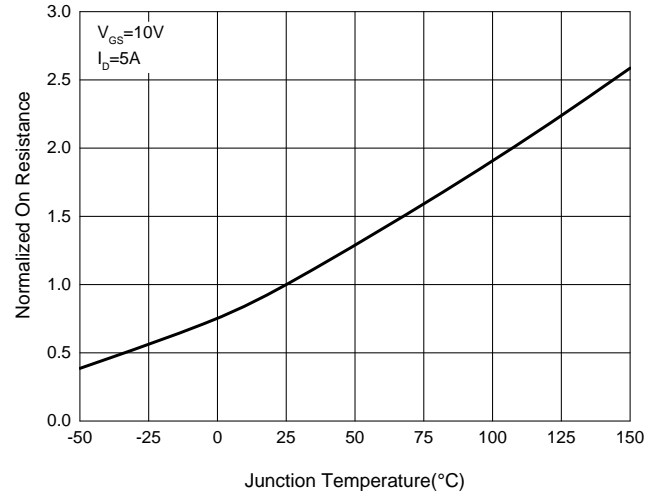


Fig. 6 - Normalized On Resistance Characteristics



## 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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### Наши контакты:

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331