

Features

- Optimized Body Diode Reverse Recovery Performance
- Low On-resistance and Low Conduction Losses
- Ultra Low Gate Charge Cause Lower Driving Requirement
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

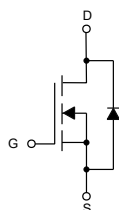
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 0.83°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	650	V
Gate-Source Vlltage		V _{GS}	±30	V
Continuous Drain Current	T _C =25°C	I _D	20	A
	T _C =100°C		12	A
Pulsed Drain Current ^(Note 2)		I _{DM}	60	A
Single Pulse Avalanche Energy ^(Note 3)		E _{AS}	484	mJ
Repetitive Avalanche Energy		E _{AR}	0.7	mJ
Avalanche Current		I _{AR}	3.5	A
Total Power Dissipation		P _D	151	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. $I_{AS}=3.5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.

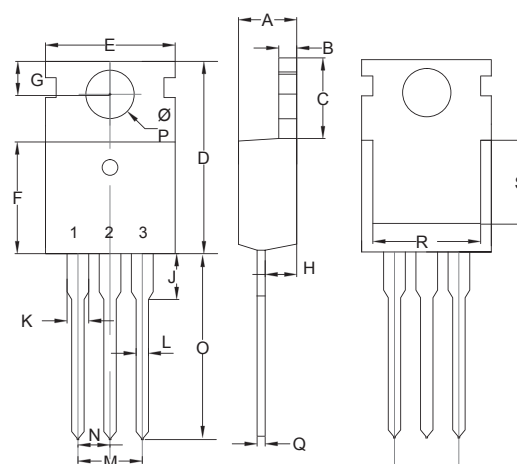
Internal Structure



1. Gate
2. Drain
3. Source

N-CHANNEL Super-Junction Power MOSFET

TO-220AB(H)



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.172	0.188	4.37	4.77	
B	0.049	0.057	1.25	1.45	
C	0.246	0.270	6.25	6.85	
D	0.594	0.634	15.10	16.10	
E	0.382	0.406	9.70	10.30	
F	0.346	0.370	8.80	9.40	
G	0.102	0.118	2.60	3.00	
H	0.087	0.102	2.20	2.60	
J	-----	0.134	-----	3.40	
K	0.046	0.058	1.17	1.47	
L	0.028	0.037	0.70	0.95	
M	0.200		5.08		TYP.
N	0.100		2.54		TYP.
O	0.502	0.543	12.75	13.80	
P	0.134	0.150	3.40	3.80	Φ
Q	0.016	0.026	0.40	0.65	
R	0.276	-----	7.00	-----	
S	0.217	-----	5.50	-----	

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, T _C =25°C			1	μA
		V _{DS} =650V, V _{GS} =0V, T _C =125°C			100	
Gate-Threshold Voltage ^(Note 4)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.5		4.5	V
Drain-Source On-Resistance ^(Note 4)	R _{DS(on)}	V _{GS} =10V, I _D =10A		150	170	mΩ
Gate Resistance ^(Note 4)	R _G	f = 1.0MHz Open Drain		12		Ω
Dynamic Characteristics ^(Note 5)						
Input Capacitance	C _{iss}	V _{DS} =100V,V _{GS} =0V,f=1MHz		1724		pF
Output Capacitance	C _{oss}			61		
Reverse Transfer Capacitance	C _{rss}			6		
Total Gate Charge	Q _g	V _{DS} =520V,V _{GS} =10V,I _D =20A		39		nC
Gate-Source Charge	Q _{gs}			8		
Gate-Drain Charge	Q _{gd}			15		
Turn-On Delay Time	t _{d(on)}	V _{DD} =400V,I _D =20A V _{GS} =10V,R _{GEN} =25Ω		15		ns
Turn-On Rise Time	t _r			59		
Turn-Off Delay Time	t _{d(off)}			121		
Turn-Off Fall Time	t _f			44		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Continuous Body Diode Current	I _S				20	A
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =I _S , di _F /dt = 100A/μs		423		ns
Reverse Recovery Charge	Q _{rr}			5.3		μC
Peak Reverse Recovery Current	I _{rrm}			25		A

Note:

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

5. Guaranteed by Design, not Subject to Production.

Curve Characteristics

Fig. 1 - Typical Output Characteristics

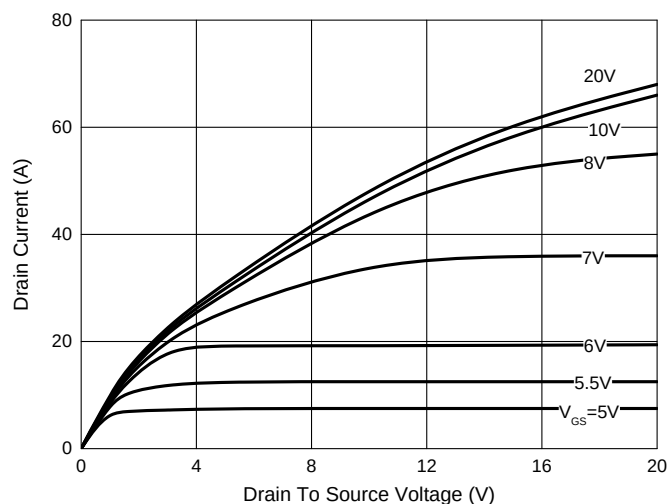


Fig. 2 - Transfer Characteristics

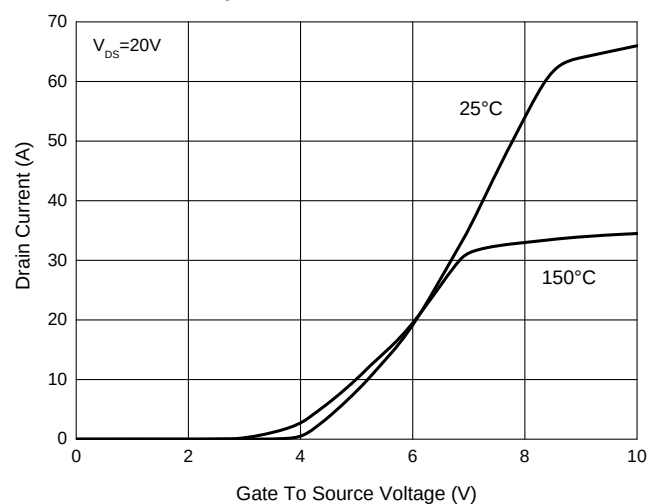


Fig. 3 - $R_{DS(ON)} - I_D$

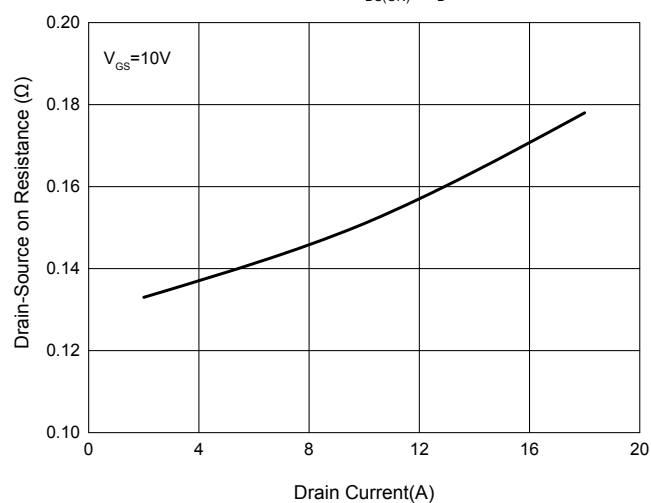


Fig. 4 - Capacitance Characteristics

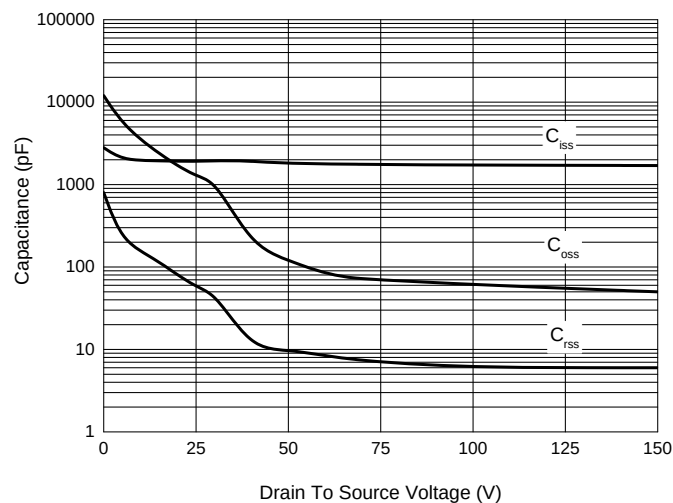


Fig. 5 - Total Gate Charge Characteristics

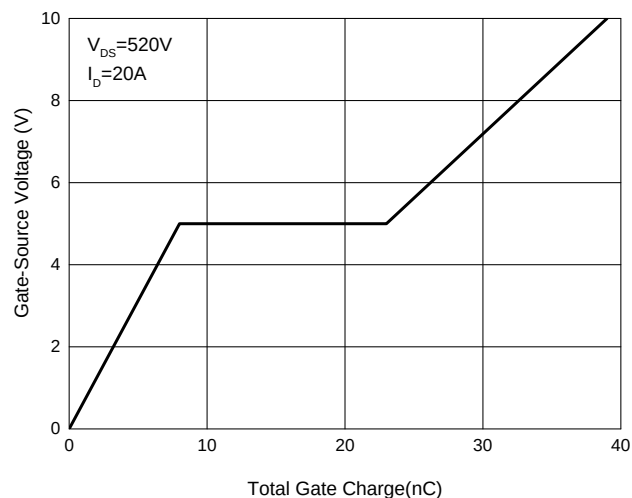
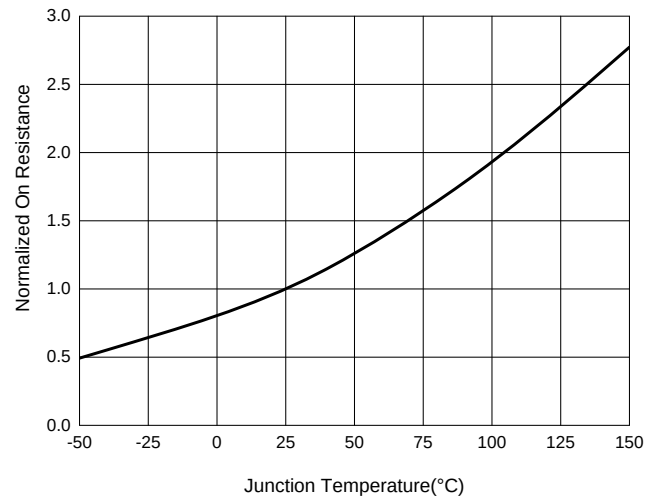


Fig. 6 - Normalized On Resistance Characteristics



Ordering Information

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

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