

Features

- Split Gate Trench MOSFET Technology
- Excellent Package for Heat Dissipation
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note2) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

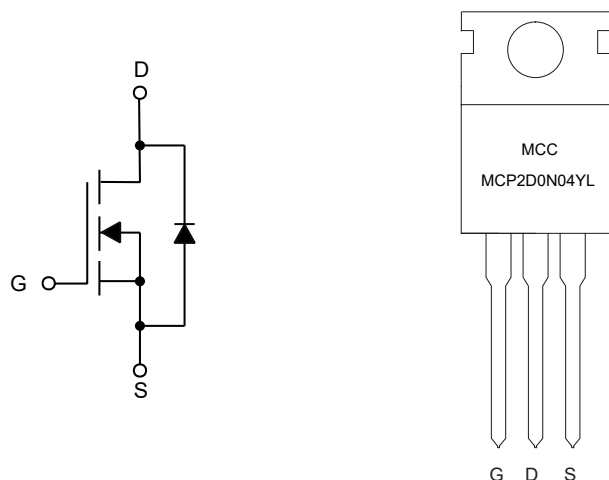
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient (Note3)
- Thermal Resistance: 0.4°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	40	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current	T _C =25°C	I _D	180	A
	T _C =100°C		113	
Pulsed Drain Current ^(Note4)		I _{DM}	720	A
Total Power Dissipation ^(Note5)		P _D	312	W
Single Pulsed Avalanche Energy ^(Note6)		E _{AS}	864	mJ

Note:

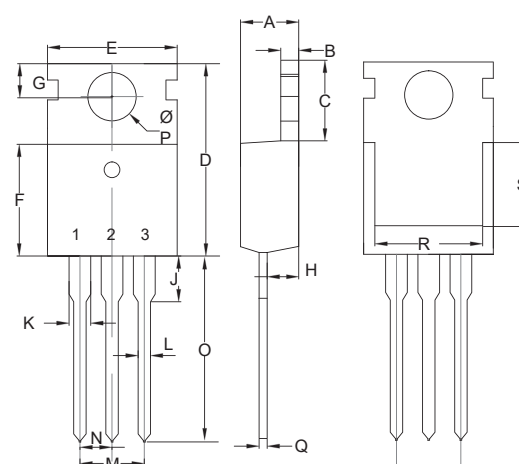
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7(a)-I.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
4. Repetitive rating; pulse width limited by max. junction temperature.
5. P_D is based on max. junction temperature, using junction-case thermal resistance.
6. $T_J=25^\circ\text{C}$, $V_{DD}=30\text{V}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, $L=3\text{mH}$.

Internal Structure and Marking Code



N-CHANNEL MOSFET

TO-220AB(H)



DIMENSIONS					
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	40			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.8	2.5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		1.6	2.0	mΩ
		V _{GS} =4.5V, I _D =20A		2.0	2.5	
Gate Resistance	R _g	f=1MHz, Open drain		1.5		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				180	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =30A,di/dt=100A/μs		75		ns
Reverse Recovery Charge	Q _{rr}			130		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f=1MHz		7400		pF
Output Capacitance	C _{oss}			1550		
Reverse Transfer Capacitance	C _{rss}			70		
Total Gate Charge	Q _g	V _{DS} =20V,V _{GS} =10V,I _D =90A		115		nC
Gate-Source Charge	Q _{gs}			17		
Gate-Drain Charge	Q _{gd}			24		
Turn-On Delay Time	t _{d(on)}	V _{DD} =20V, V _{GS} =10V, R _G =2.2Ω, I _D =90A		19		ns
Turn-On Rise Time	t _r			74		
Turn-Off Delay Time	t _{d(off)}			52		
Turn-Off Fall Time	t _f			14		

Curve Characteristics

Fig.1 - Typical Output Characteristics

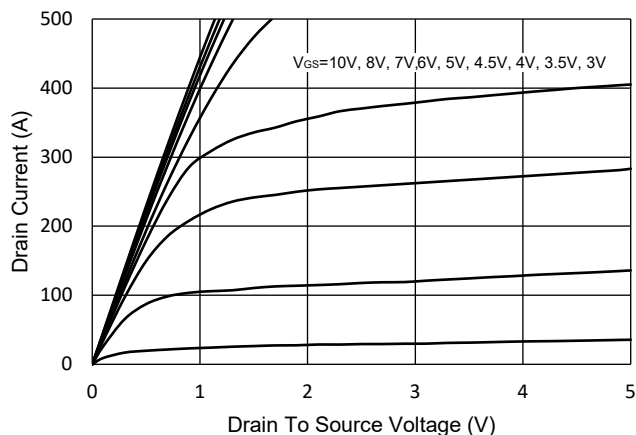


Fig.2 - Transfer Characteristics

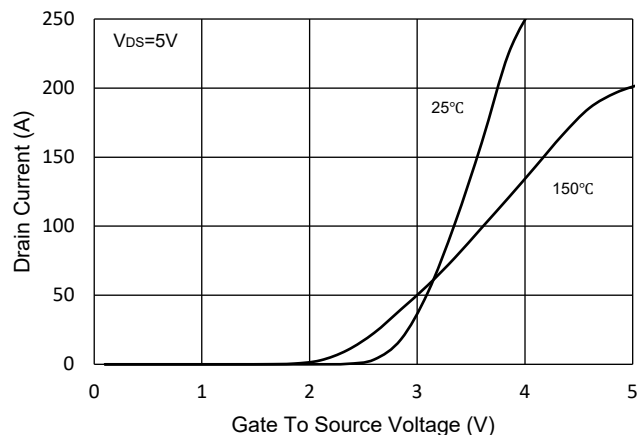


Fig.3 - $R_{DS(ON)}$ - V_{GS}

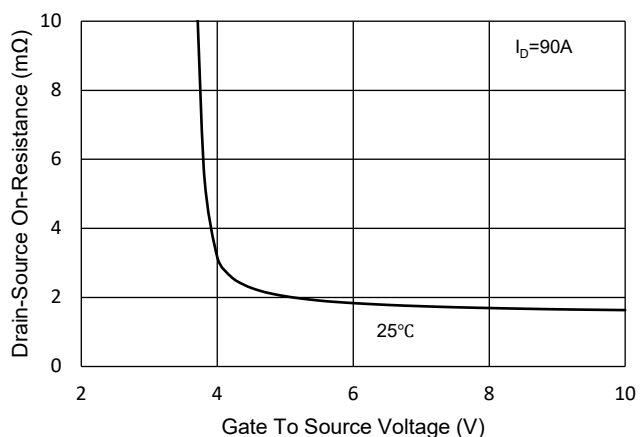


Fig.4 - $R_{DS(ON)}$ - I_D

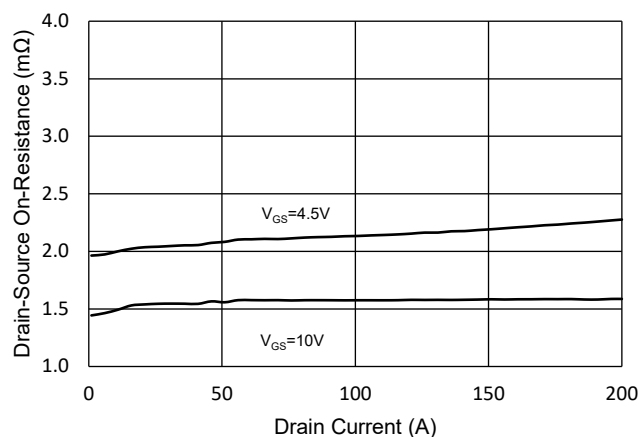


Fig.5 - Capacitance Characteristics

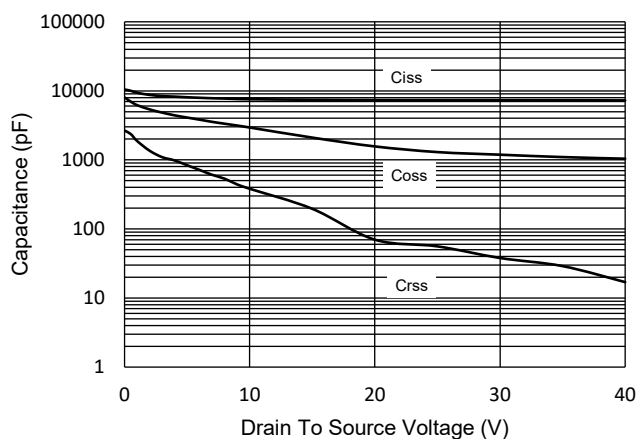
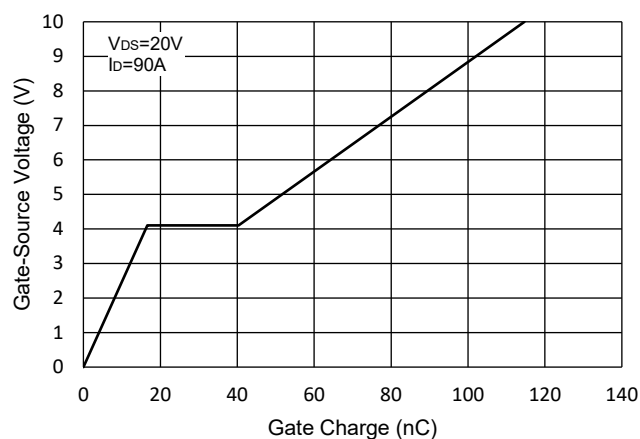


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

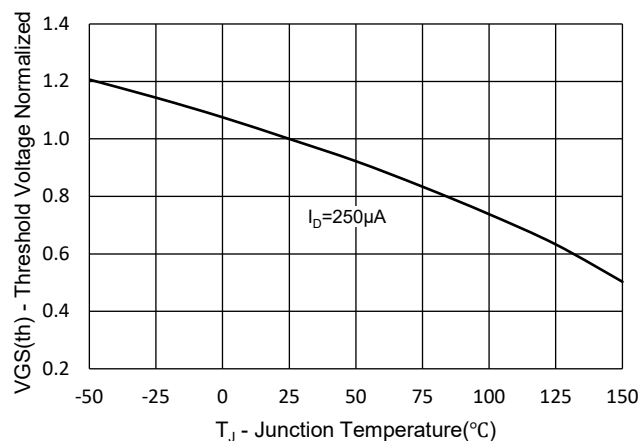


Fig.8 - Normalized On Resistance Characteristics

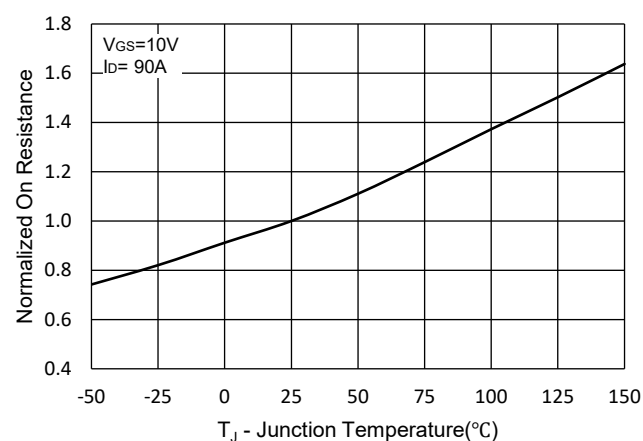


Fig.9 - $I_S - V_{SD}$

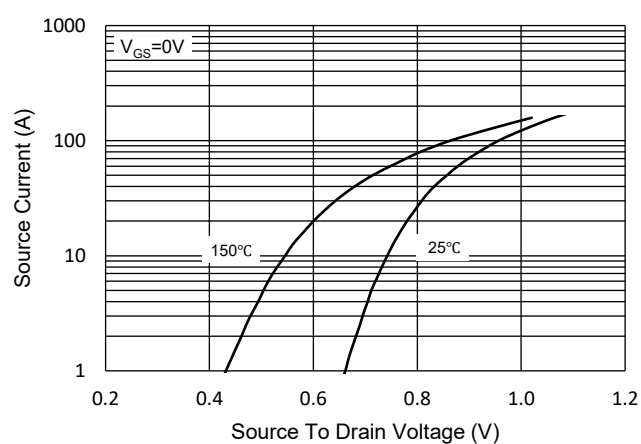


Fig.10 - Drain Current

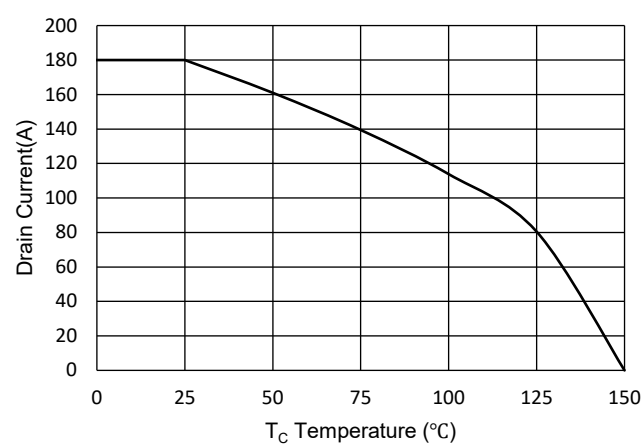
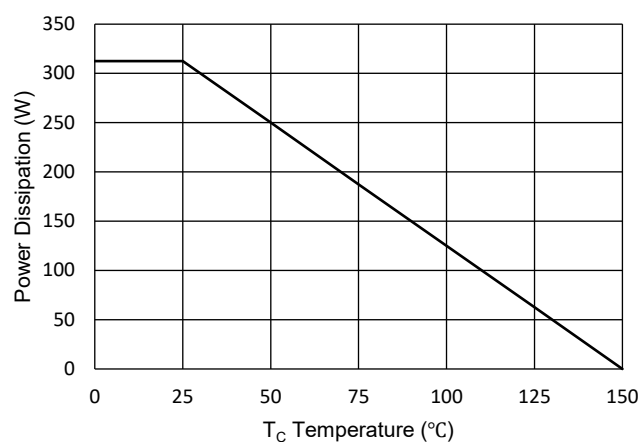


Fig.11 - PD Dissipation



Ordering Information

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

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