

Features

- High Current Rating
- Lower $R_{DS(ON)}$
- Lower Capacitance
- Lower Total Gate Charge
- Tighter V_{SD} Specifications
- Avalanche Energy Specified
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

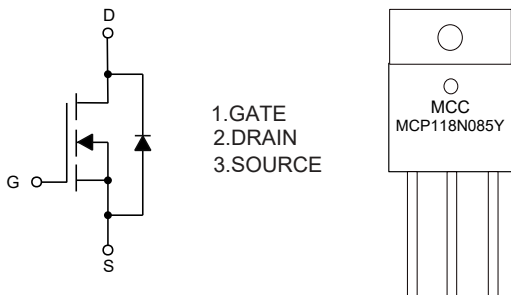
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient
- Thermal Resistance: 0.6°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	118
		$T_C=100^\circ\text{C}$	74
Pulsed Drain Current	I_{DM}	472	A
Single Pulse Avalanche Energy (Note2)	E_{AS}	351	mJ
Total Power Dissipation	P_D	200	W

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

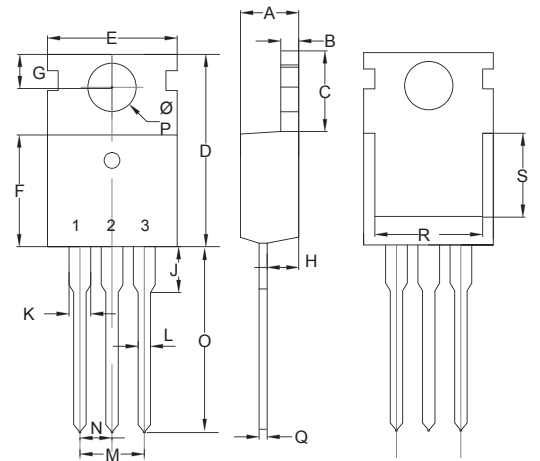
2. $L=0.5\text{mH}$, $I_{AS}=37.5\text{A}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$

Internal Structure and Marking Code



N-CHANNEL MOSFET

TO-220AB(H)



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	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 (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	85			V
Gate-Threshold Voltage ^(Note3)	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Gate-Body Leakage Current ^(Note3)	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 85V, V_{GS} = 0V$			1	μA
Drain-Source On-Resistance ^(Note3)	$R_{DS(on)}$	$V_{GS}=10V, I_D=59A$		5	6.5	m Ω
		$V_{GS}=6V, I_D=20A$		7.5	10	
Gate resistance	R_G	f=1MHz, Open drain		1.6		Ω
Drain- Source Diode Forward Voltage ^(Note3)	V_{SD}	$V_{GS} = 0V, I_S = 59A$		0.9	1.2	V
Dynamic Characteristics						
Input Capacitance ^(Note4)	C_{iss}	$V_{DS}=40V, V_{GS}=0V, f=1MHz$		4300		pF
Output Capacitance ^(Note4)	C_{oss}			900		
Reverse Transfer Capacitance ^(Note4)	C_{riss}			250		
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=40V, V_{GS}=10V, I_D=59A$		62		nC
Gate-Source Charge	Q_{gs}			20		
Gate-Drain Charge	Q_{gd}			17		
Reverse Recovery Time	t_{rr}	$I_F=59A, di/dt=870A/\mu s$		26		ns
Reverse Recovery Charge	Q_{rr}			157		nC
Turn-on Delay Time ^(Note4)	$t_{d(on)}$	$V_{DD}=40V, V_{GS}=10V, R_G=2.2\Omega, I_D=59A$		18		ns
Turn-on Rise Time ^(Note4)	t_r			86		
Turn-off Delay Time ^(Note4)	$t_{d(off)}$			30		
Turn-off Fall Time ^(Note4)	t_f			9		

Note: 3. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
 4. These Parameters Have No Way to Verify

Curve Characteristics

Fig. 1 - Typical Output Characteristics

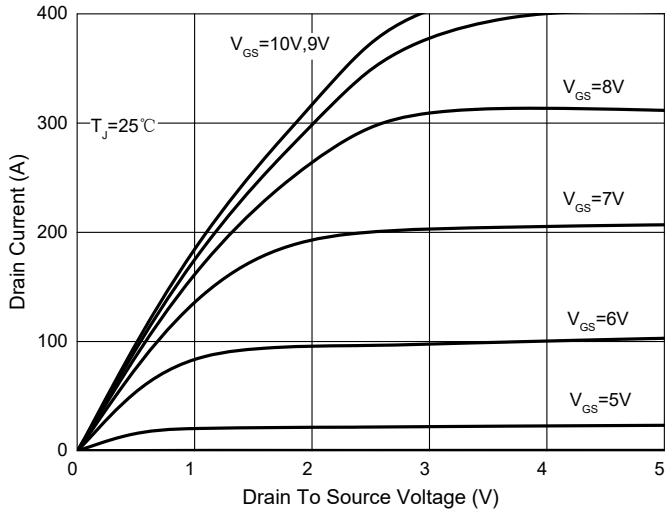


Fig. 2 - Transfer Characteristics

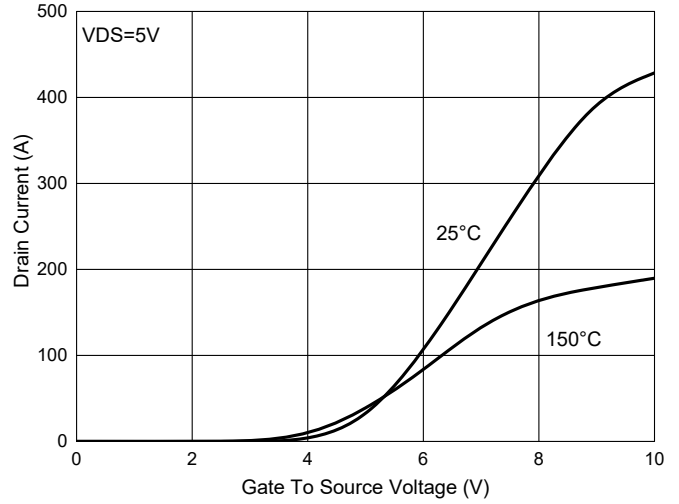


Fig. 3 - $R_{DS(ON)} - I_D$

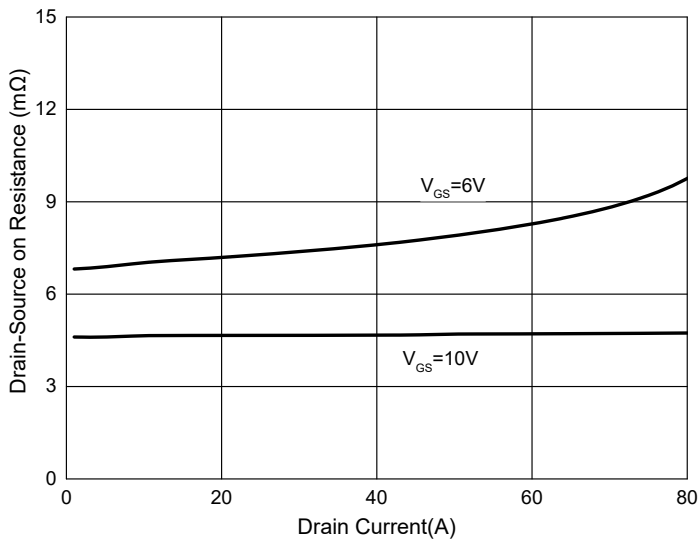


Fig. 4 - $R_{DS(ON)} - V_{GS}$

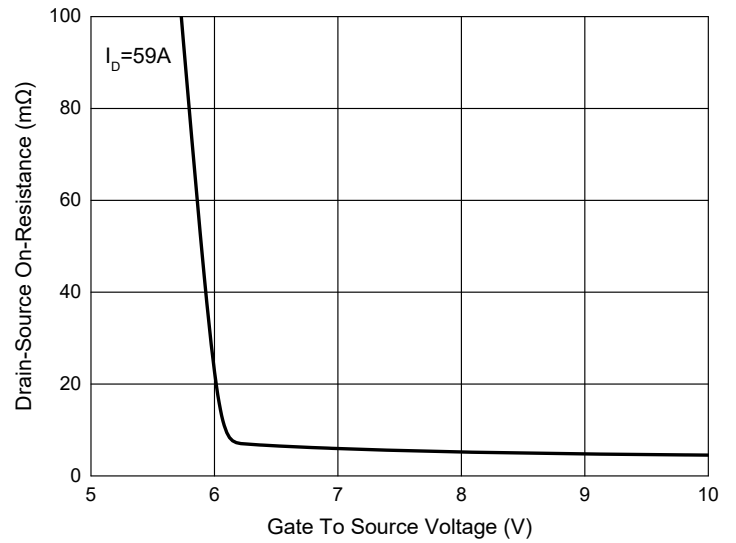


Fig. 5 - $I_S - V_{SD}$

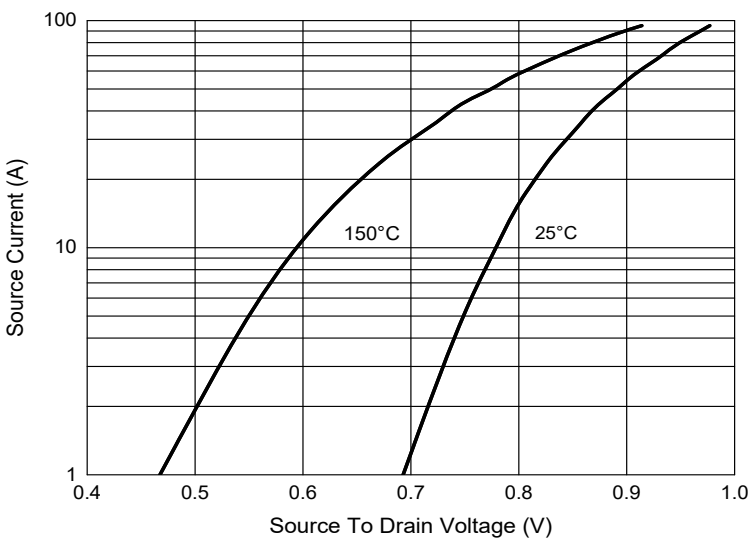
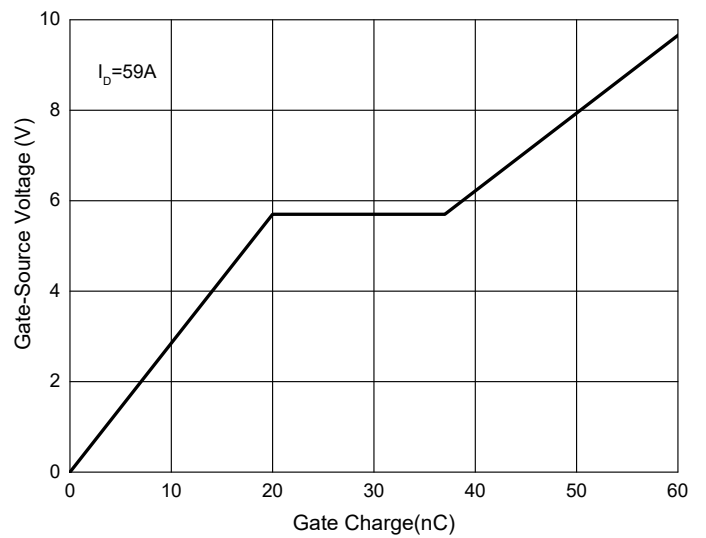


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized On Resistance Characteristics

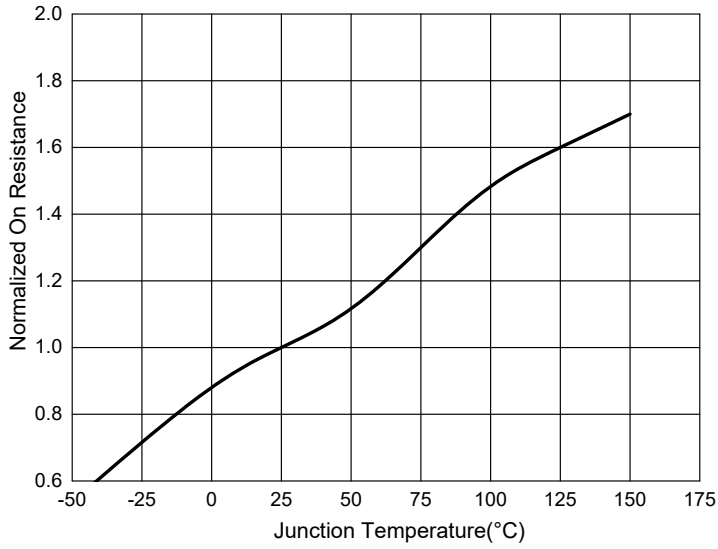


Fig. 8 - Capacitance Characteristics

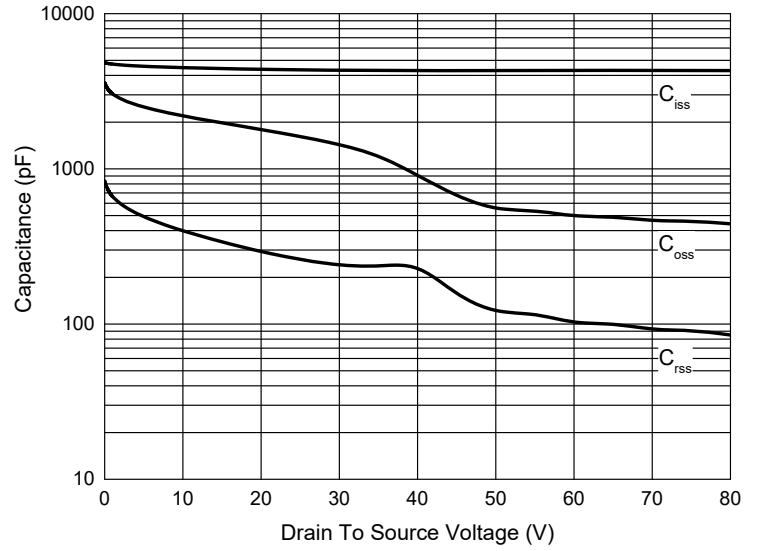


Fig. 9 - Power Dissipation

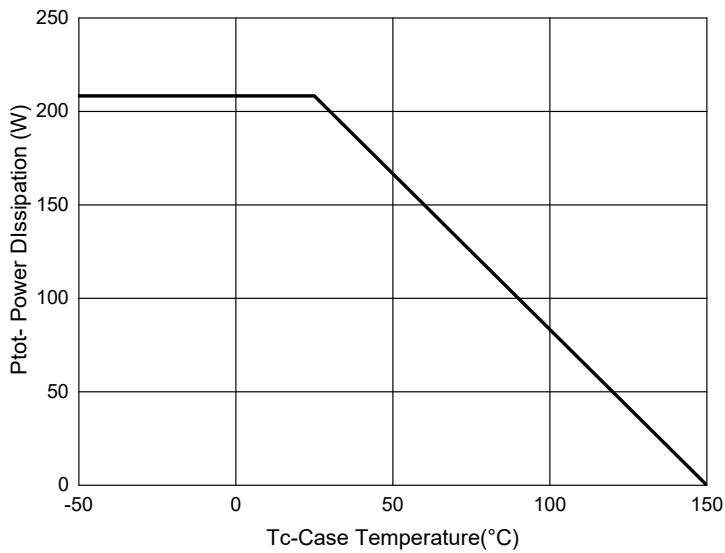


Fig. 10 - Safe Operation Area

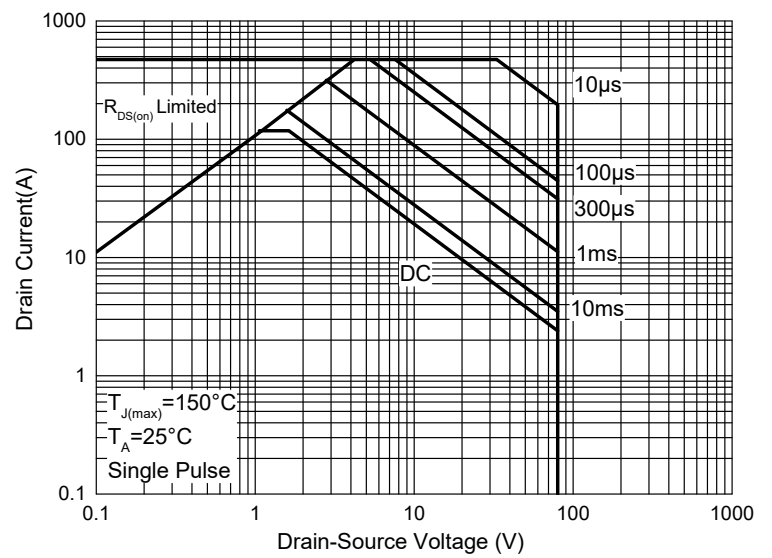
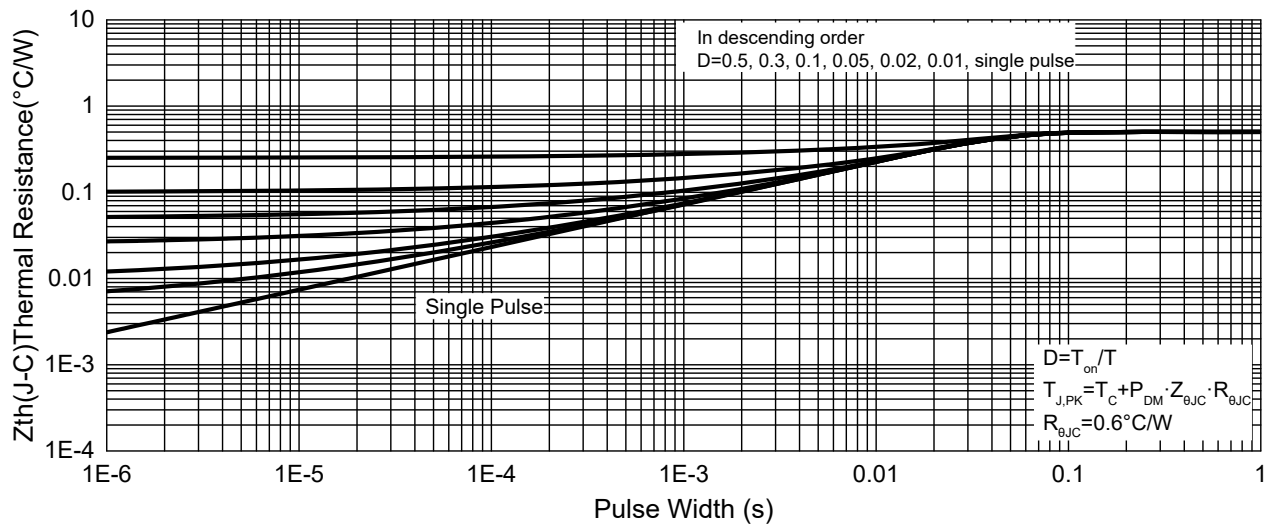


Fig. 11 - Maximum Transient Thermal Impedance



Ordering Information

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

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