

## Features

- Reduced Switching and Conduction Losses
- Low on-Resistance and Lower Gate Resistance
- Super Junction technology for High Voltage Application
- Ultra Low Gate Charge Cause Lower Driving Requirement
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note2)("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

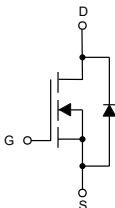
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient (Note 3)
- Thermal Resistance: 0.53°C/W Junction to Case

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	600	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	30.5
		$T_C=100^\circ\text{C}$	19.5
Pulsed Drain Current <sup>(Note 4)</sup>	$I_{DM}$	122	A
Total Power Dissipation, $T_C=25^\circ\text{C}$	$P_D$	236	W
Single Avalanche Energy <sup>(Note 5)</sup>	$E_{AS}$	16	mJ

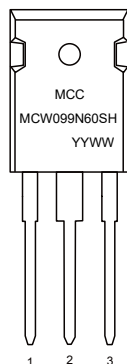
Note:

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 7a.
3. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> 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.  $T_J=25^\circ\text{C}$ ,  $V_{DD}=50\text{V}$ ,  $V_{GS}=10\text{V}$ ,  $L=0.5\text{mH}$ .

## Internal Structure and Marking Code



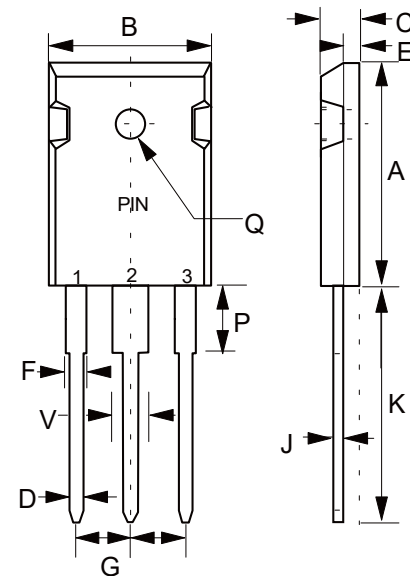
1. Gate
2. Drain
3. Source



YYWW: 4 codes in total  
YY is the year  
WW is the week

# N-CHANNEL MOSFET

## TO-247



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.787	0.866	20.00	22.00	
B	0.598	0.638	15.20	16.20	
C	0.185	0.208	4.70	5.30	
D	0.035	0.059	0.90	1.50	
E	0.059	0.094	1.50	2.40	
F	0.067	0.091	1.70	2.30	
J	0.019	0.031	0.48	0.80	
K	0.748	0.833	19.00	21.15	
P	0.122	0.189	3.10	4.80	
Q	0.118	0.150	3.00	3.80	Φ
V	0.106	0.134	2.70	3.40	
G	0.197	0.224	5.00	5.70	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=1mA$	600			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 30V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=2.1mA$	2.5	3.7	4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15.3A$		85	99	m $\Omega$
Gate Resistance	$R_g$	f=1MHz, open drain		1.2		$\Omega$
<b>Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=15.3A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=400V, I_F=15.3A$ $dI_F/dt=100A/\mu s$		309		ns
Reverse Recovery Charge	$Q_{rr}$			5.4		nC
Peak Reverse Recovery Current	$I_{rrm}$			36		A
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=100V, V_{GS}=0V, f=1MHz$		2224		pF
Output Capacitance	$C_{oss}$			125		
Reverse Transfer Capacitance	$C_{rss}$			19		
Total Gate Charge	$Q_g$	$V_{DS}=400V, V_{GS}=10V, I_D=15.3A$		56.5		nC
Gate-Source Charge	$Q_{gs}$			13.5		
Gate-Drain Charge	$Q_{gd}$			27		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, V_{GS}=10V$ $R_G=10\Omega, I_D=15.3A$		50.5		ns
Turn-On Rise Time	$t_r$			26		
Turn-Off Delay Time	$t_{d(off)}$			71		
Turn-Off Fall Time	$t_f$			14		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

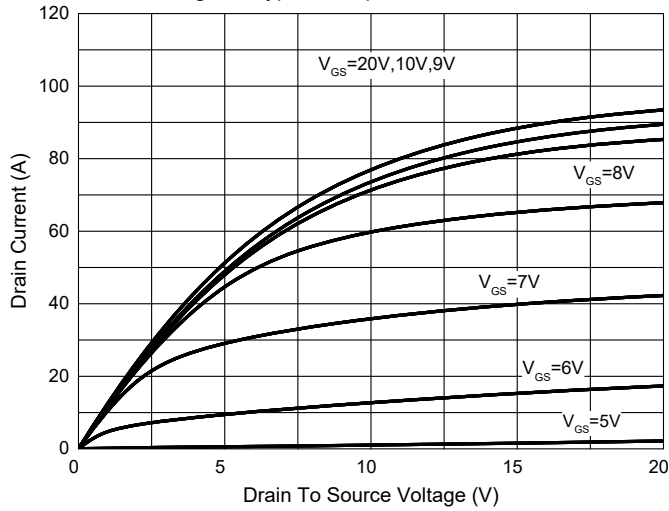


Fig. 2 - Transfer Characteristics

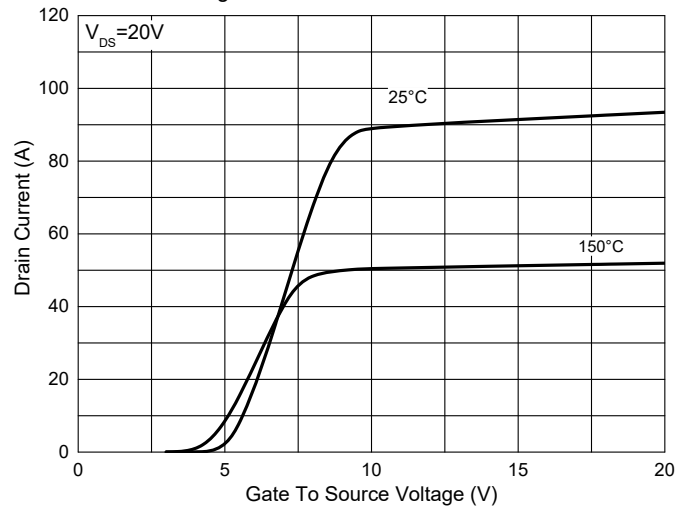


Fig. 3 -  $R_{DS(ON)} - V_{GS}$

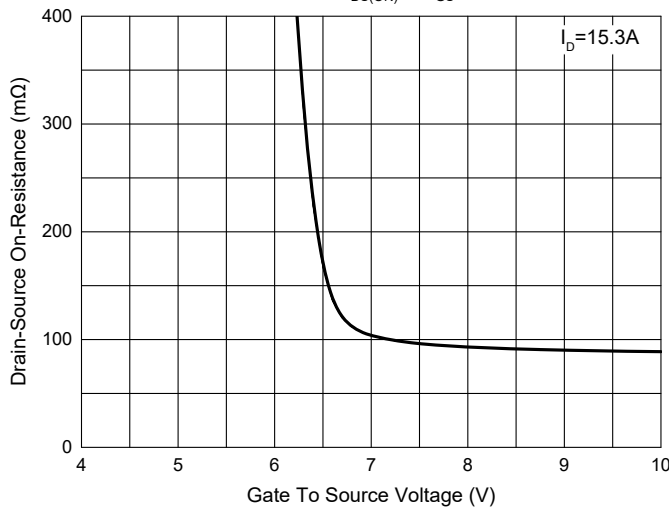


Fig. 4 -  $R_{DS(ON)} - I_D$

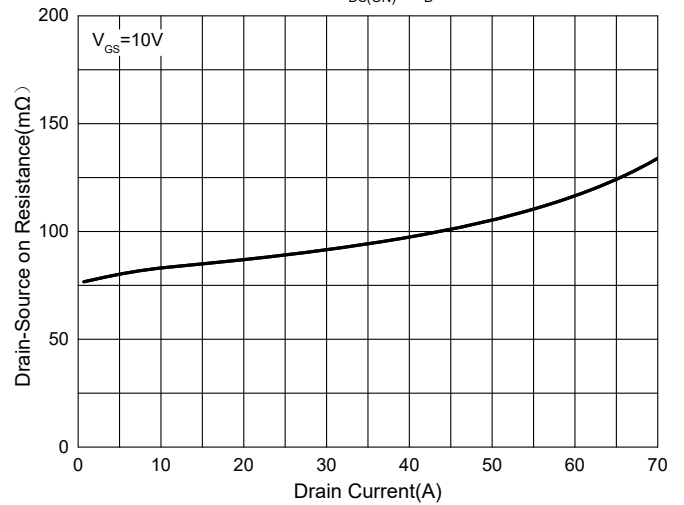


Fig. 5 - Capacitance Characteristics

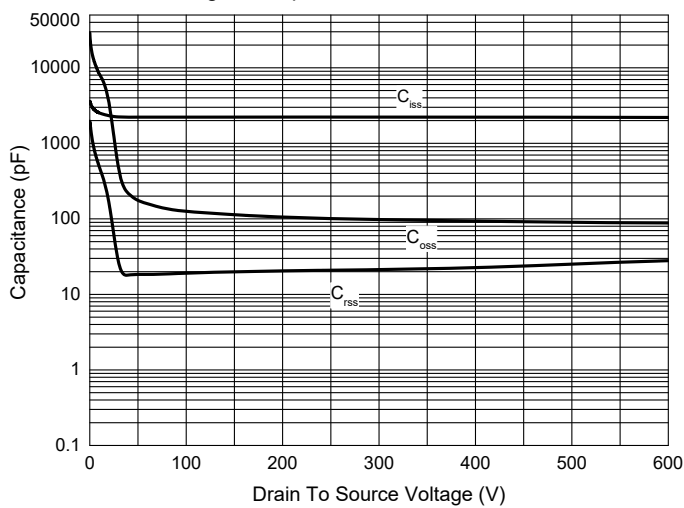
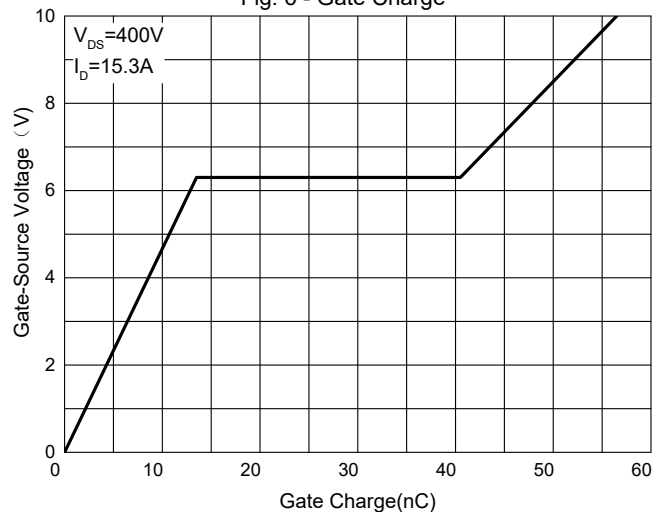


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

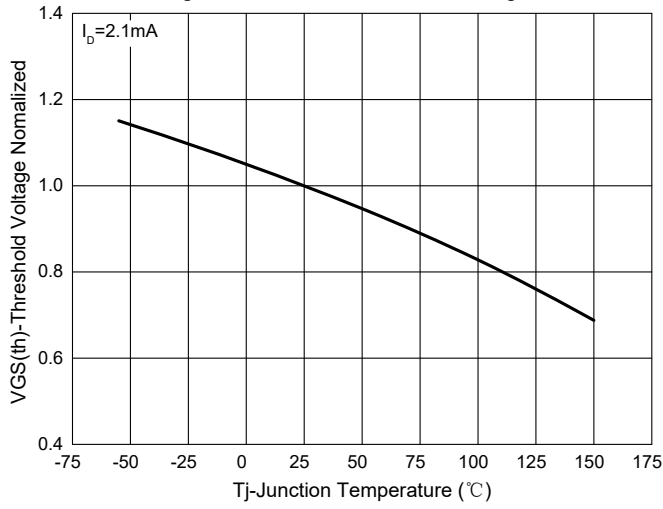


Fig.8-Normalized On Resistance Characteristics

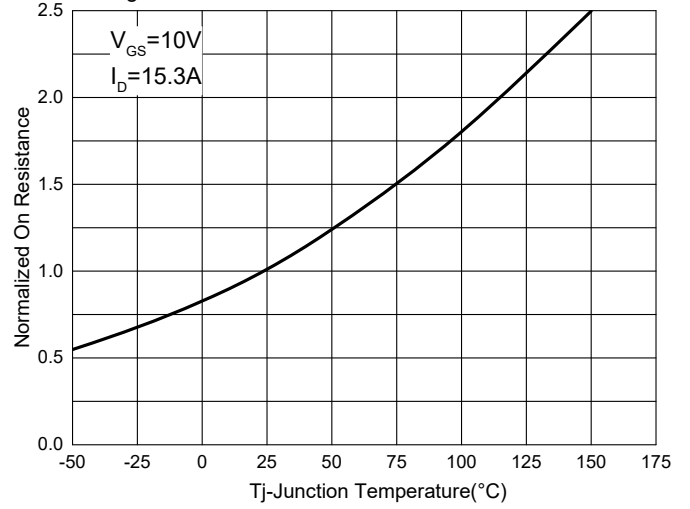


Fig.9 -  $I_s - V_{SD}$

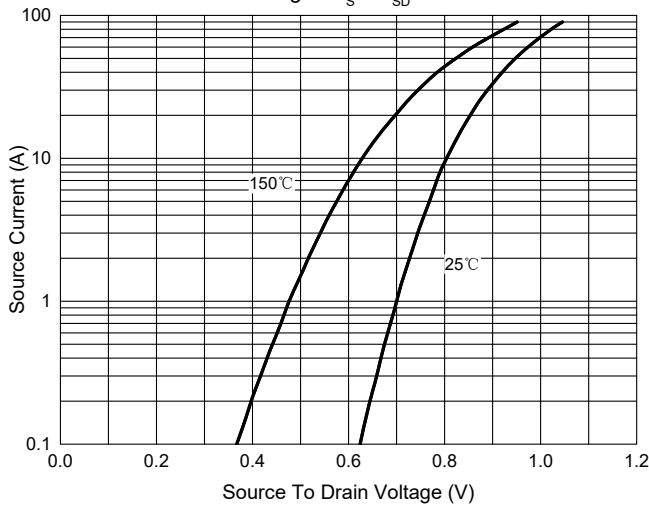


Fig. 10 - Drain Current

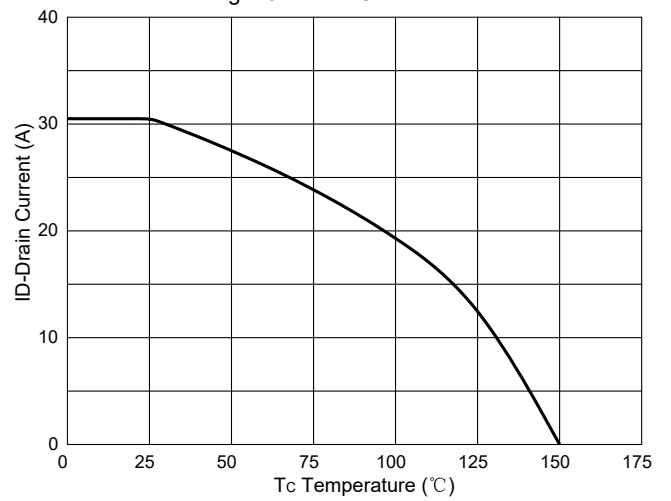
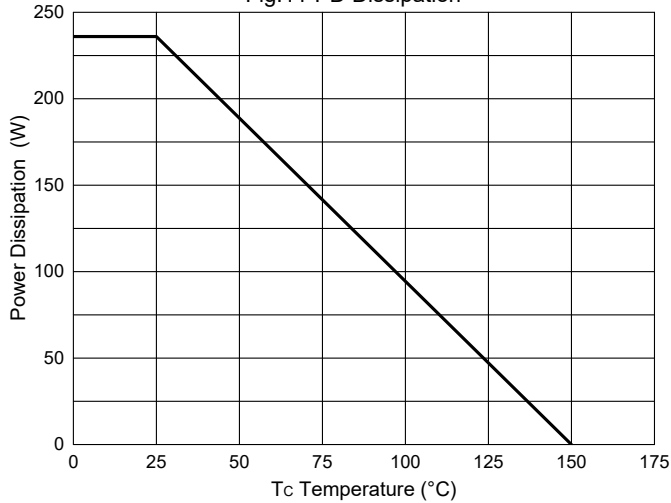


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

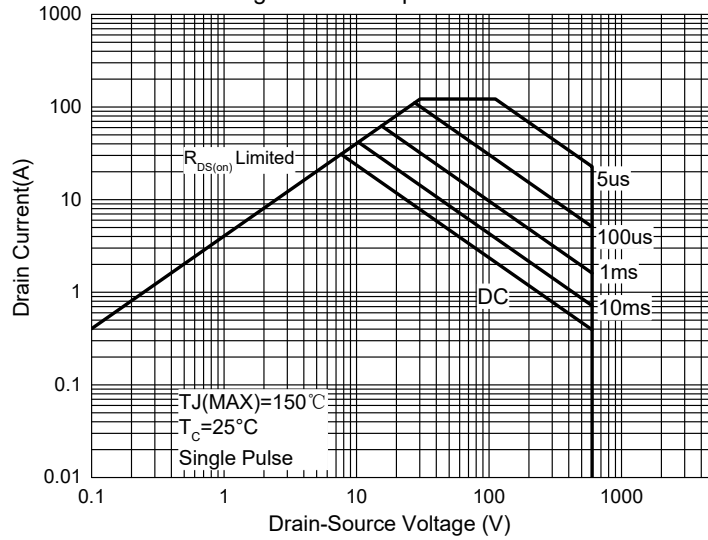
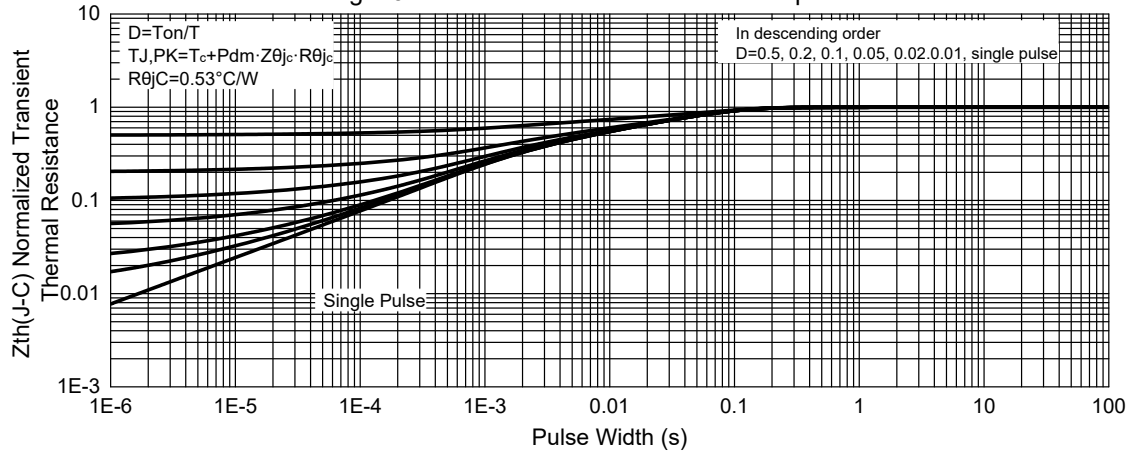


Fig. 13 -Normalized Transient Thermal Impedance



## Ordering Information

Device	Packing
Part Number-BP	Tube:30pcs/Tube, 360pcs/Box,1.8K/Ctn;

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