

## Features

- Low On-resistance and Low gate charge
- Super Junction technology for High Voltage Application
- Fast Switching performance with ease of usage and robustness
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free."Green" Device<sup>(Note 1)</sup>
- Lead Free Finish/RoHS Compliant<sup>(Note 2)</sup>. "P" Suffix Designates RoHS Compliant. See Ordering Information

# N-CHANNEL Super-Junction Power MOSFET

## Maximum Ratings

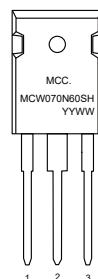
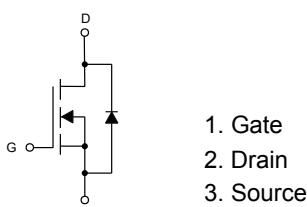
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 40°C/W Junction to Ambient <sup>(Note 3)</sup>
- Thermal Resistance: 0.48°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	600	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	38	A
		24	
Pulsed Drain Current <sup>(Note 4)</sup>	$I_{DM}$	152	A
Total Power Dissipation <sup>(Note 5)</sup>	$P_D$	260	W
Single Pulsed Avalanche Energy <sup>(Note 6)</sup>	$E_{AS}$	56	mJ

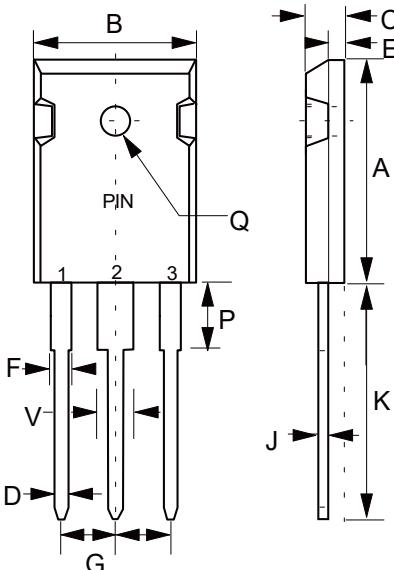
Note:

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  $T_A = 25^\circ C$ .
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.  $T_J = 25^\circ C$ ,  $V_{DD} = 50V$ ,  $V_{GS} = 10V$ ,  $I_{AS} = 15A$ .

## Internal Structure and Marking Code



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



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	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$			1.0	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=2.9mA$	2.5	3.5	4.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		58	70	$m\Omega$
Gate Resistance	$R_g$	f=1MHz, open drain		1.1		$\Omega$
<b>Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=20A$			1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=300V, I_F=20A$ $dI_F/dt=100A/\mu s$		344		ns
Reverse Recovery Charge	$Q_{rr}$			6.7		$uC$
Peak Reverse Recovery Current	$I_{rrm}$			39.5		A
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=100V, V_{GS}=0V, f=1MHz$		3146		$pF$
Output Capacitance	$C_{oss}$			168		
Reverse Transfer Capacitance	$C_{rss}$			18.2		
Total Gate Charge	$Q_g$	$V_{DS}=300V, V_{GS}=10V, I_D=20A$		80		$nC$
Gate-Source Charge	$Q_{gs}$			17		
Gate-Drain Charge	$Q_{gd}$			39		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V, V_{GS}=10V$ $R_G=3\Omega, I_D=20A$		32		$ns$
Turn-On Rise Time	$t_r$			21.6		
Turn-Off Delay Time	$t_{d(off)}$			47		
Turn-Off Fall Time	$t_f$			6.7		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

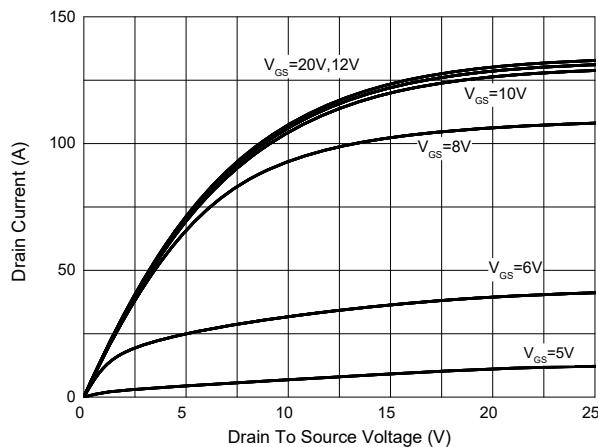


Fig. 2 - Typical Transfer Characteristics

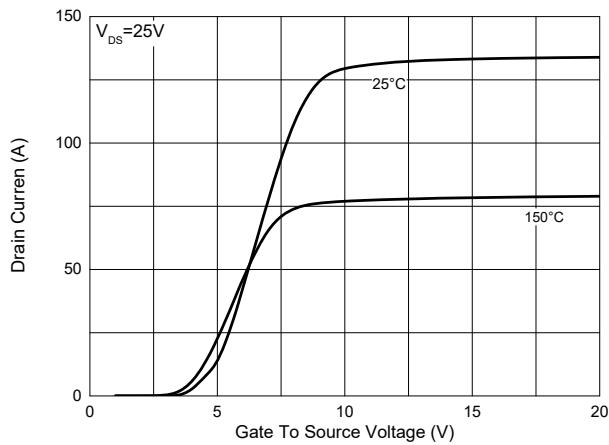


Fig. 3 -  $R_{DS(ON)}$ — $V_{GS}$

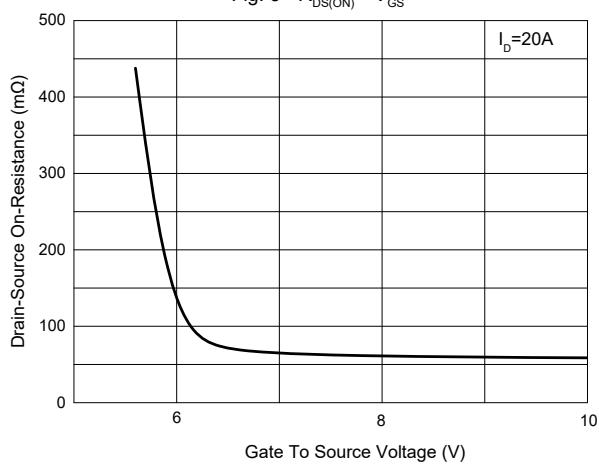


Fig. 4 -  $R_{DS(ON)}$ — $I_D$

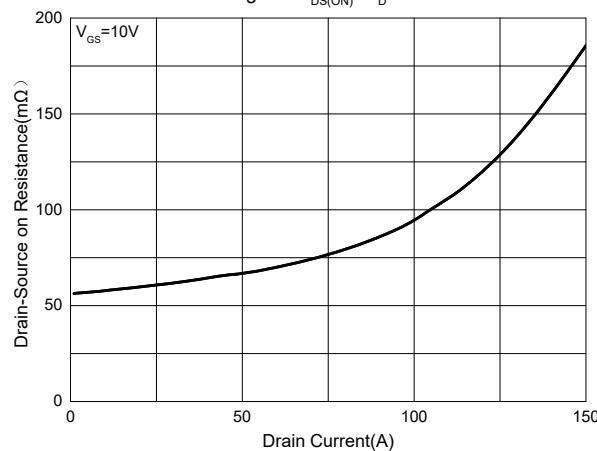


Fig. 5 - Capacitance Characteristics

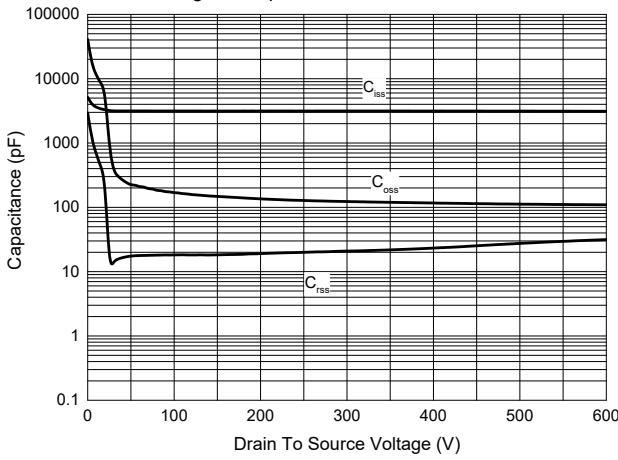
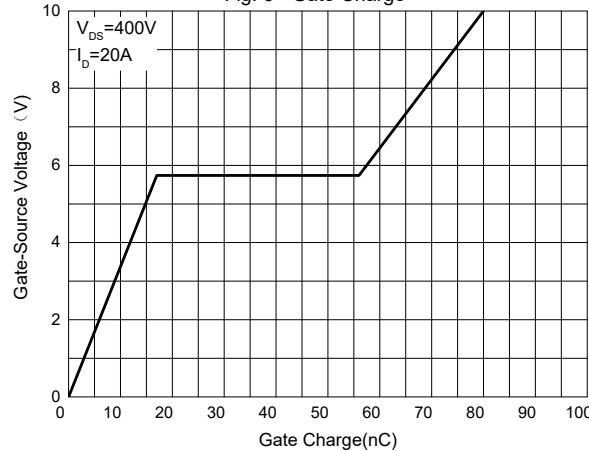
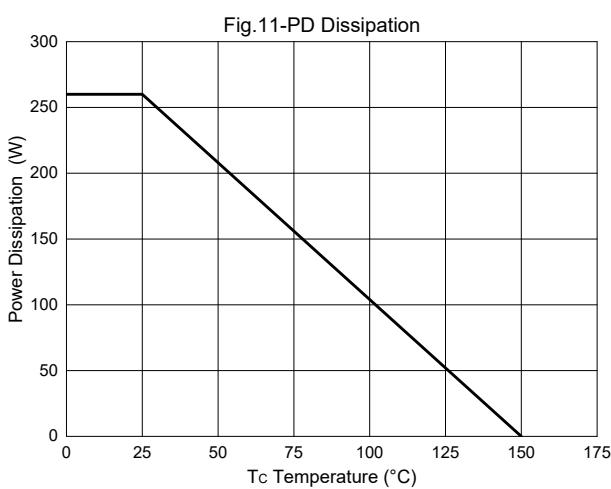
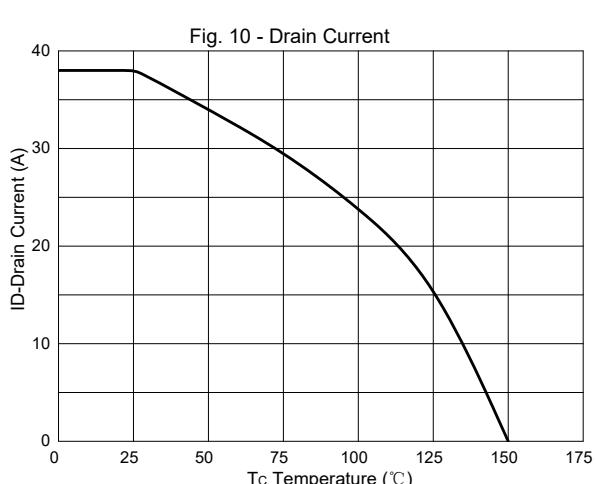
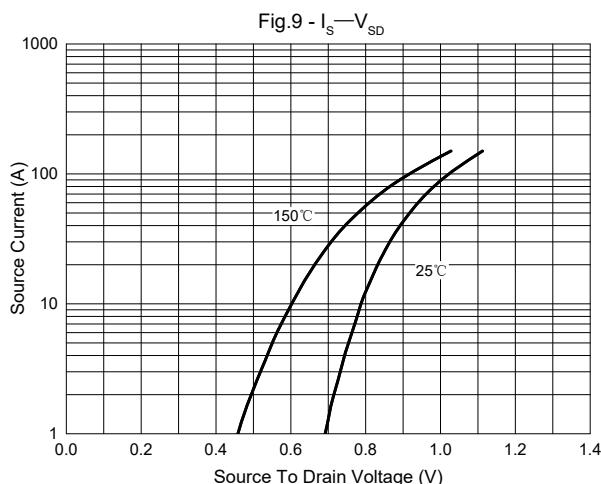
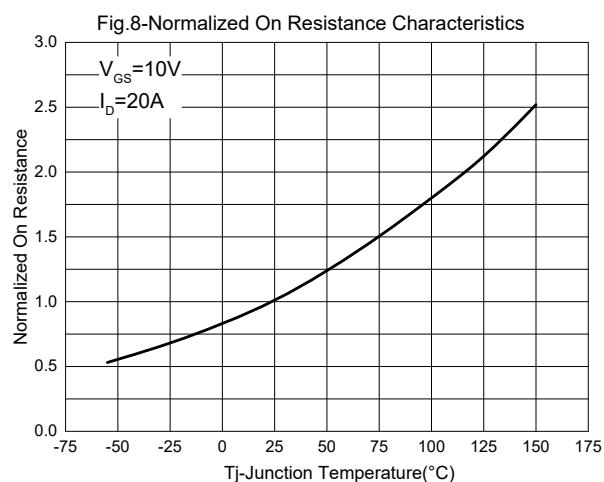
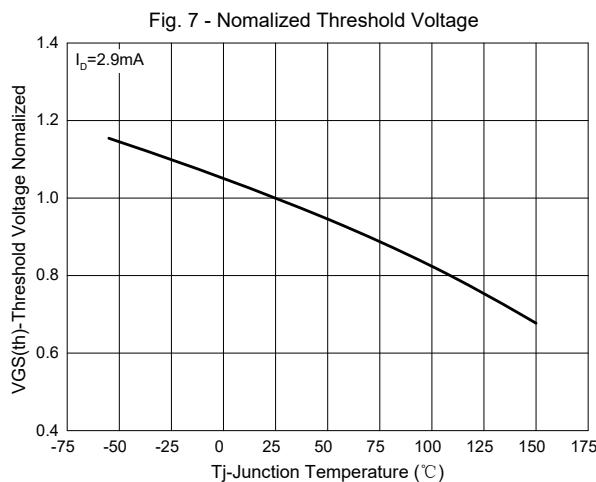


Fig. 6 - Gate Charge



## Curve Characteristics



## Curve Characteristics

Fig. 12 - Safe Operation Area

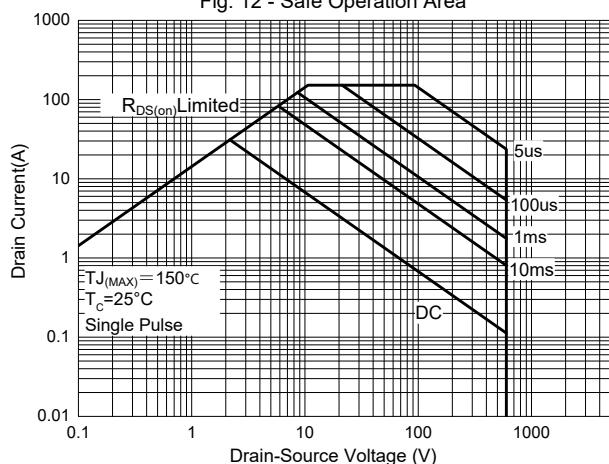
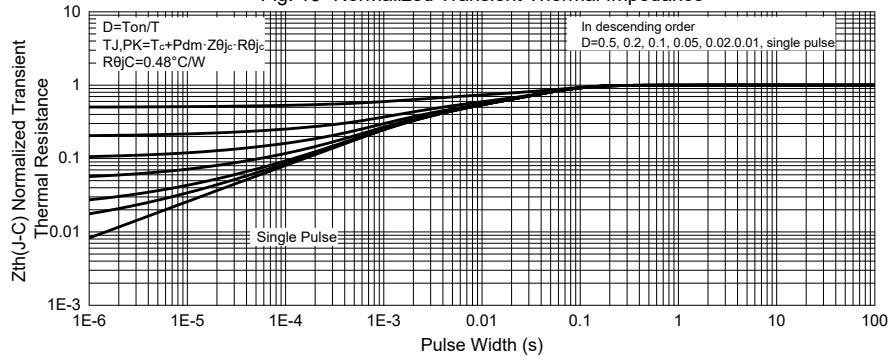


Fig. 13 - Normalized Transient Thermal Impedance



## Ordering Information

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

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