

Features

- Low On-resistance and Low Conduction Loss
- Super Junction technology for High Voltage Application
- Soft Switching with Fast Reverse Recovery Diode
- Ultra Low Gate Charge Cause Lower Driving Requirement
- 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

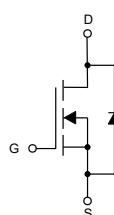
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance Junction to Ambient,Max^(Note 2): 40°C/W
- Thermal Resistance Junction to Case,Max : 0.52°C/W

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	$T_C=25^{\circ}\text{C}$ 30.6	A
		$T_C=100^{\circ}\text{C}$ 19.3	
Pulsed Drain Current ^(Note 3)	I_{DM}	122.4	A
Total Power Dissipation, $T_C=25^{\circ}\text{C}$	P_D	240	W
Single Avalanche Energy ^(Note 4)	E_{AS}	42.25	mJ

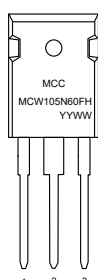
Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Device mounted on 1 in² FR-4 board with 2oz. single-sided Copper, in a still air environment with $T_A=25^{\circ}\text{C}$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. Starting $T_J=25^{\circ}\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $I_{AS}=13\text{A}$.

Internal Structure and Marking Code



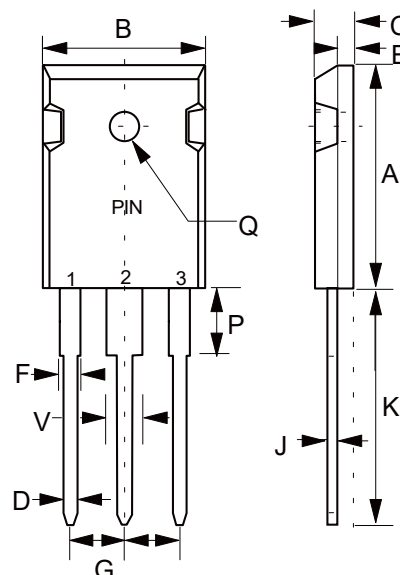
1. Gate
2. Drain
3. Source



Device Code: MCW105N60FH
Date Code: YYWW (Year & Week)

N-CHANNEL Super-Junction Power MOSFET

TO-247



DIMENSIONS

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 ($T_J = 25^\circ\text{C}$ 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 =1mA	600			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V			10	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =2.1mA	3	4.2	5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =15.3A		95	105	mΩ
Gate Resistance	R _g	f=1MHz, open drain		1.3		Ω
Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =15.3A		0.9	1.2	V
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =15.3A dI _F /dt=100A/μs		105		ns
Reverse Recovery Charge	Q _{rr}			595		nC
Peak Reverse Recovery Current	I _{rrm}			10		A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=1MHz		2240		pF
Output Capacitance	C _{oss}			99		
Reverse Transfer Capacitance	C _{rss}			2.8		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =15.3A		57		nC
Gate-Source Charge	Q _{gs}			15		
Gate-Drain Charge	Q _{gd}			28		
Turn-On Delay Time	t _{d(on)}	V _{DD} =400V, V _{GS} =10V R _G =10Ω, I _D =15.3A		100		ns
Turn-On Rise Time	t _r			35		
Turn-Off Delay Time	t _{d(off)}			65		
Turn-Off Fall Time	t _f			22		

Typical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Fig. 1 - Typical Output Characteristics ($T_J=25^\circ\text{C}$)

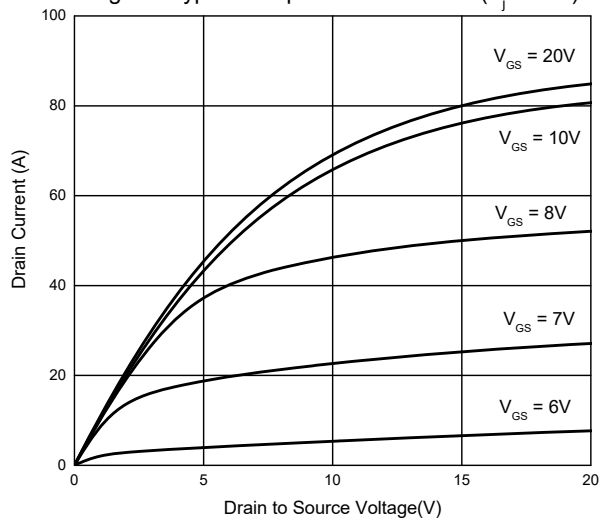


Fig. 2 - Typical Transfer Characteristics

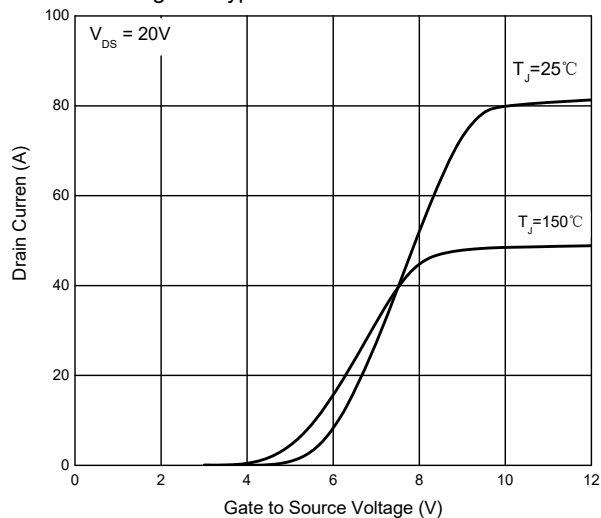


Fig. 3 - On-Resistance vs Gate Bias

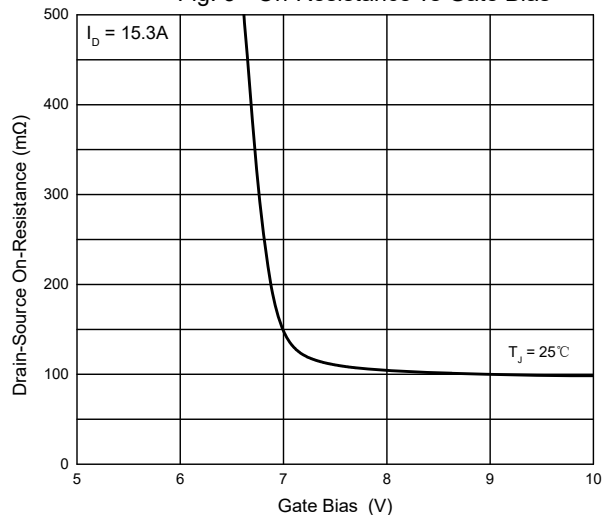


Fig. 4 - On-Resistance vs Drain Current

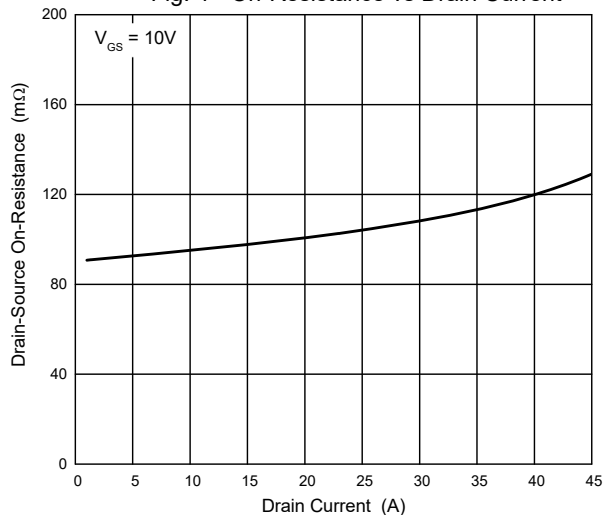


Fig. 5 - Capacitance Characteristic

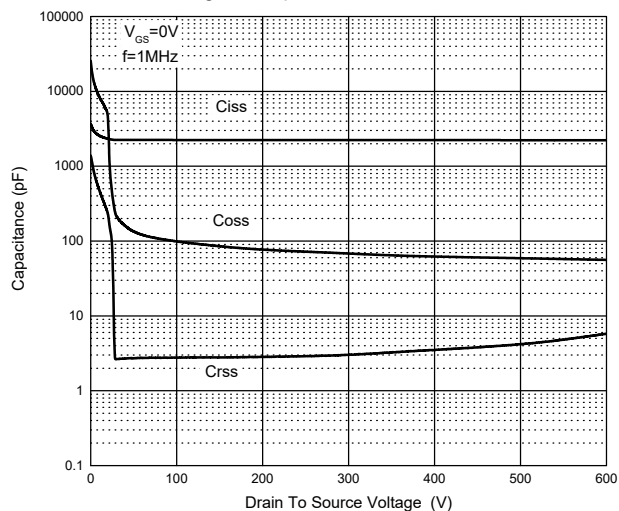
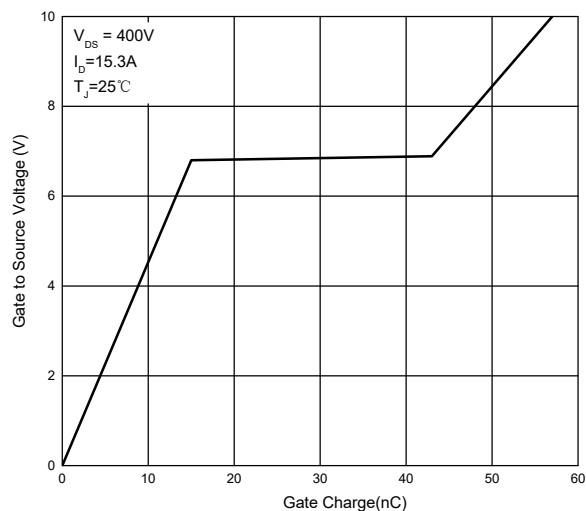


Fig. 6 - Typical Gate Charge



Typical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Fig. 7 - Gate-Threshold Voltage vs Junction Temperature

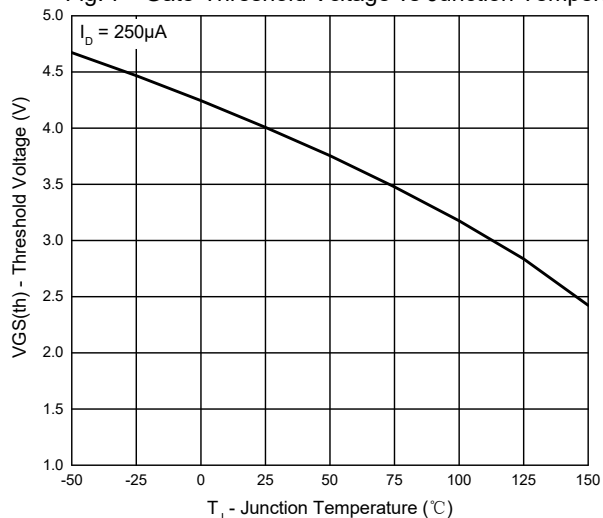


Fig. 8 - Normalized On-Resistance

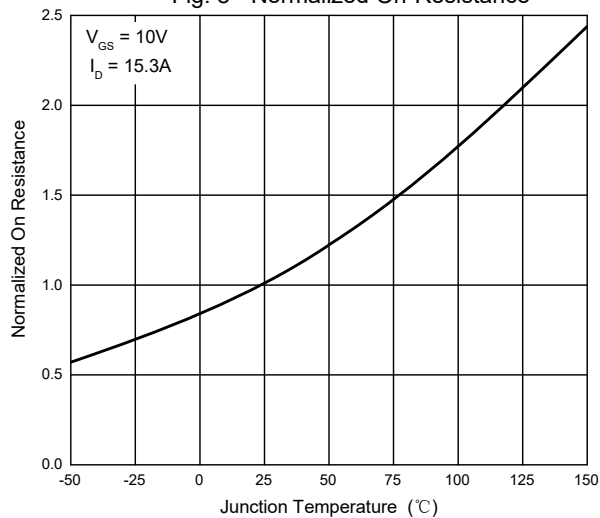


Fig. 9 - Forward Characteristics

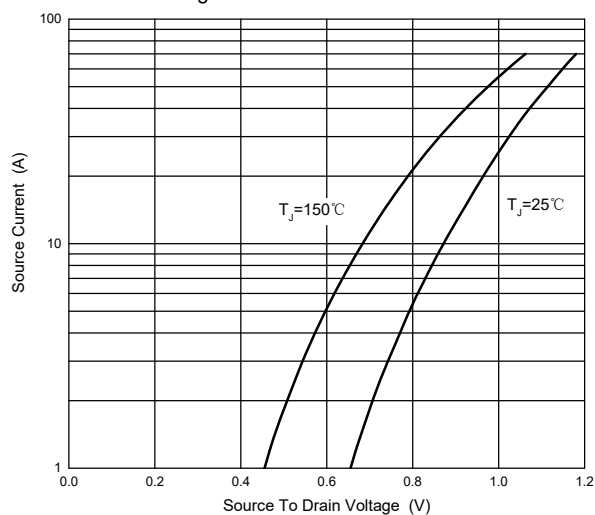


Fig. 10 - Drain Current

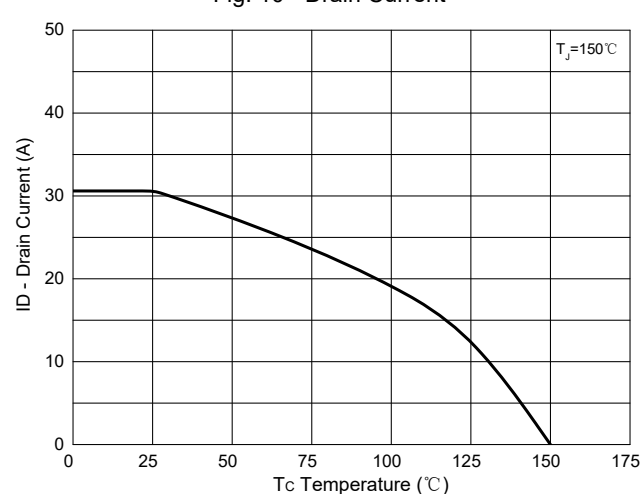


Fig. 11 - Power Dissipation

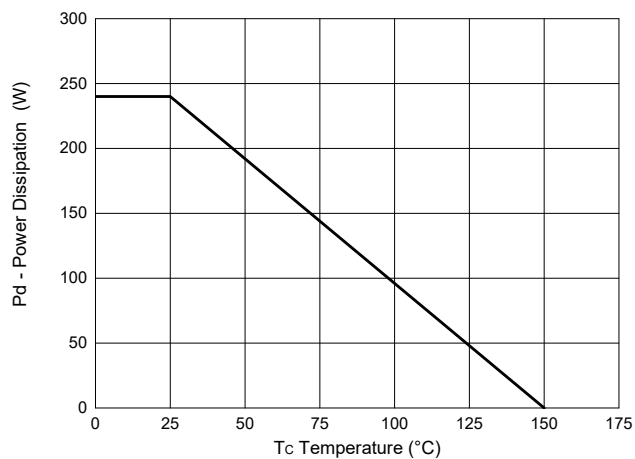
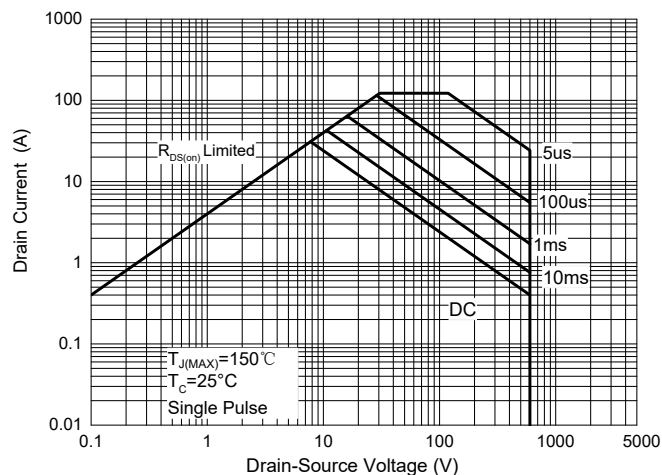
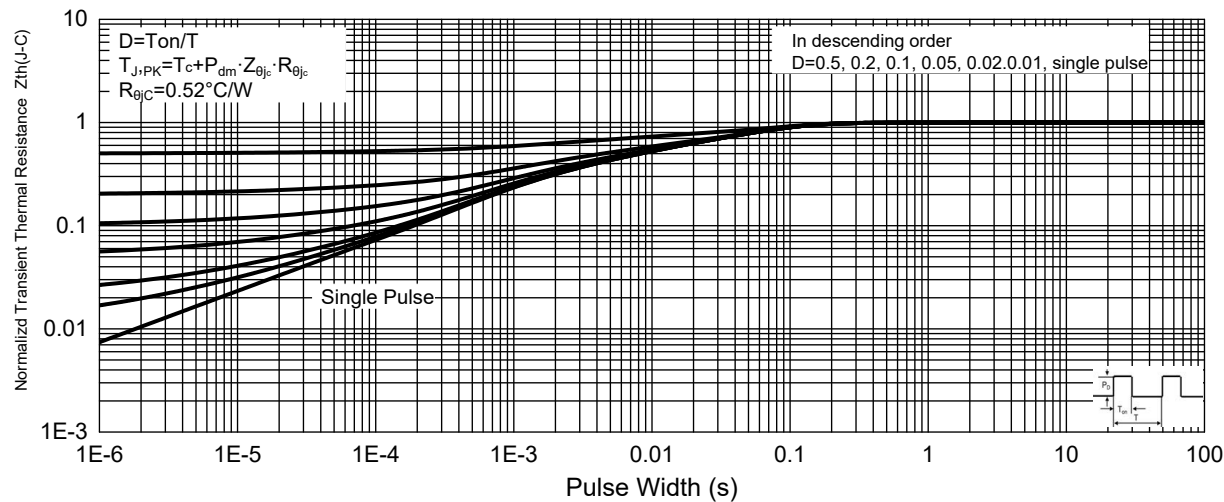


Fig. 12 - Safe Operating Area



Typical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Fig.13 - Normalized Transient Thermal Impedance, Junction-Case



Ordering Information

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

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