

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
- Moisture Sensitivity Level 1
- 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

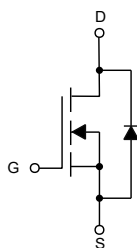
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance Junction to Ambient, Max^(Note 2): 60°C/W
- Thermal Resistance Junction to Case, Max : 1.18°C/W

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	A
		$T_C=100^\circ\text{C}$	
Pulsed Drain Current ^(Note 3)	I_{DM}	92	A
Total Power Dissipation, $T_C=25^\circ\text{C}$	P_D	106	W
Single Avalanche Energy ^(Note 4)	E_{AS}	132	mJ

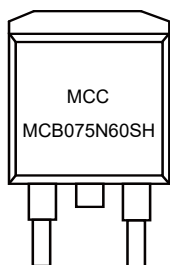
Note:

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 $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $I_{AS}=23\text{A}$.

Internal Structure and Marking Code



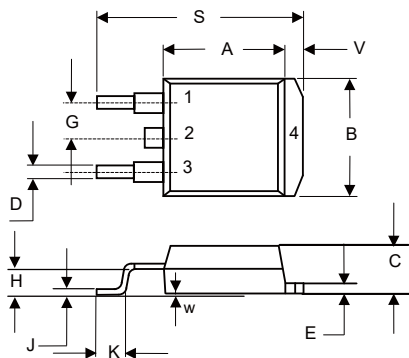
1. Gate
- 2,4. Drain
3. Source



Device Code: MCB075N60SH

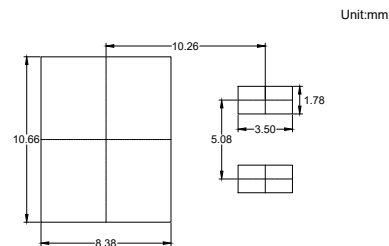
N-CHANNEL Super-Junction Power MOSFET

D²-PAK



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.331	0.370	8.40	9.40	
B	0.378	0.417	9.60	10.60	
C	0.165	0.189	4.20	4.80	
D	0.027	0.037	0.68	0.94	
E	0.045	0.055	1.14	1.40	
G	0.10		2.54		TYP.
H	0.096	0.134	2.43	3.40	
J	0.011	0.025	0.28	0.64	
K	0.071	0.131	1.80	3.32	
S	0.575	0.625	14.60	15.87	
V	0.042	0.058	1.07	1.47	
W	0.000	0.010	0.00	0.25	

Suggested Solder Pad Layout



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 =2.8mA	3	4	5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		65	75	mΩ
Gate Resistance	R _g	f=1MHz, open drain		1		Ω
Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A		0.9	1.2	V
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =20A dI _F /dt=100A/μs		115		ns
Reverse Recovery Charge	Q _{rr}			723		nC
Peak Reverse Recovery Current	I _{rrm}			11		A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=1MHz		3202		pF
Output Capacitance	C _{oss}			135		
Output capacitance - energy related	C _{o(er)}	V _{DS} =0 to 400V, V _{GS} =0V		132		
Output capacitance - time related	C _{o(tr)}			857		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =20A		81		nC
Gate-Source Charge	Q _{gs}			21		
Gate-Drain Charge	Q _{gd}			41		
Turn-On Delay Time	t _{d(on)}	V _{DD} =400V, V _{GS} =10V R _G =5.6Ω, I _D =20A		66		ns
Turn-On Rise Time	t _r			20		
Turn-Off Delay Time	t _{d(off)}			57		
Turn-Off Fall Time	t _f			15		

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

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

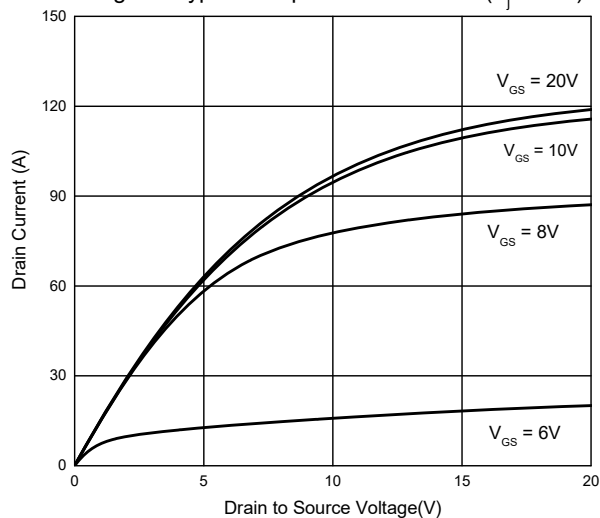


Fig. 2 - Typical Transfer Characteristics

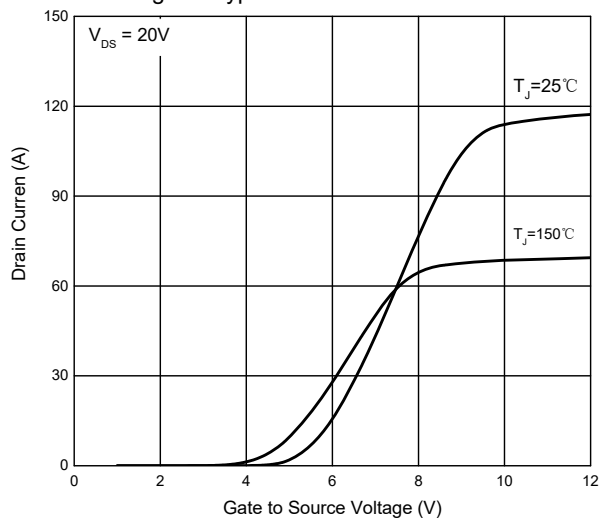


Fig. 3 - On-Resistance vs Gate Bias

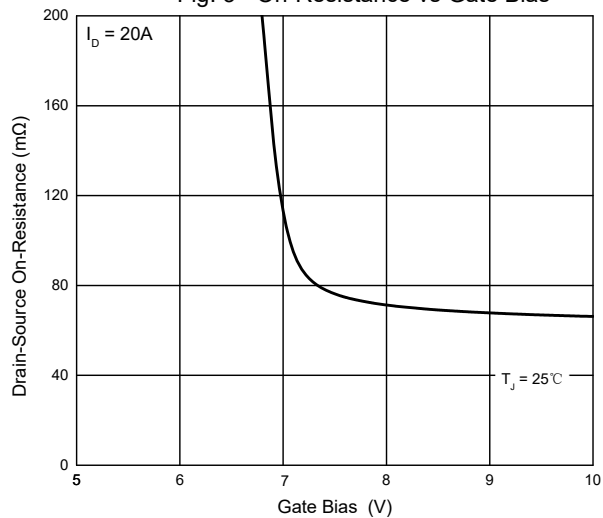


Fig. 4 - On-Resistance vs Drain Current

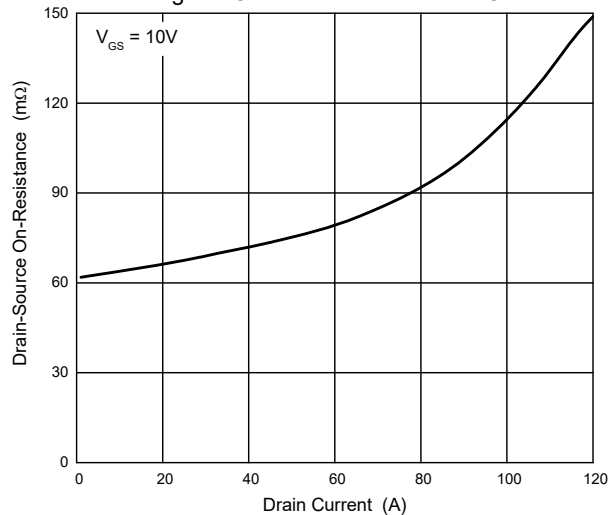


Fig. 5 - Capacitance Characteristic

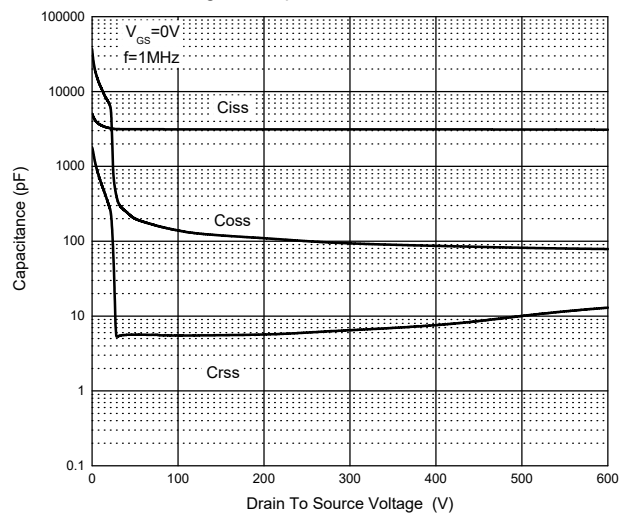
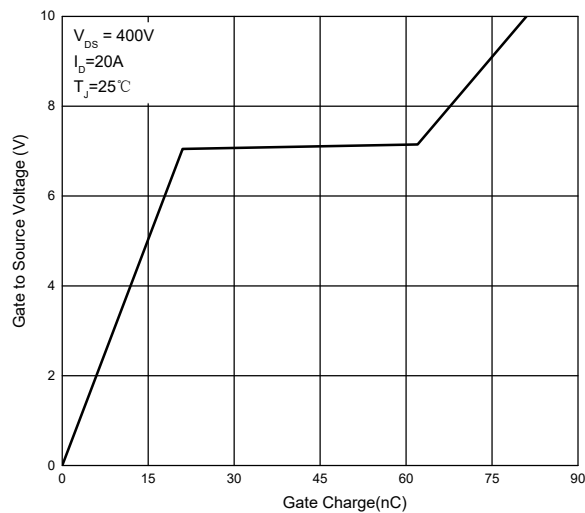


Fig. 6 - Typical Gate Charge



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

Fig. 7 - Gate-Threshold Voltage vs Junction Temperature

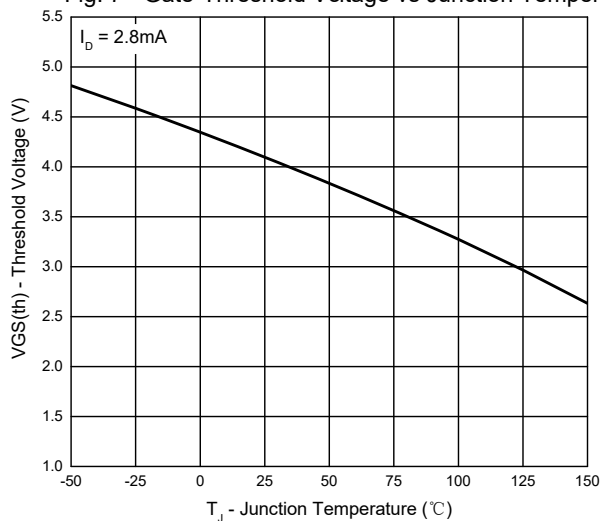


Fig. 8 - Normalized On-Resistance

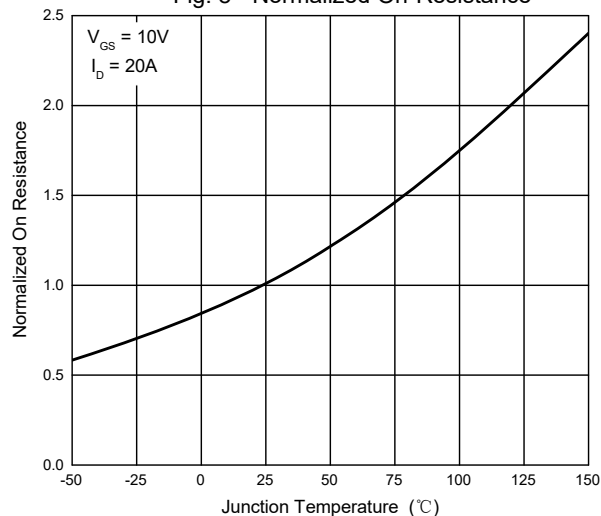


Fig. 9 - Forward Characteristics

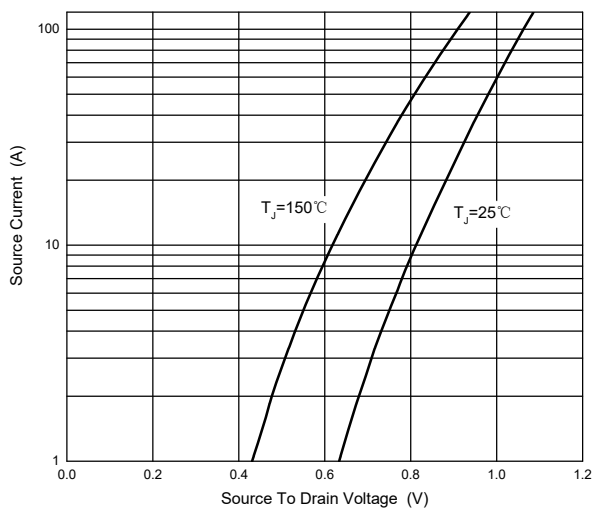


Fig. 10 - Drain Current

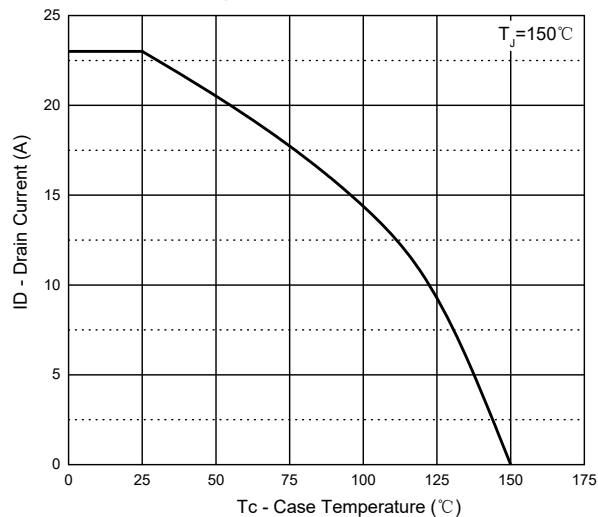


Fig. 11 - Power Dissipation

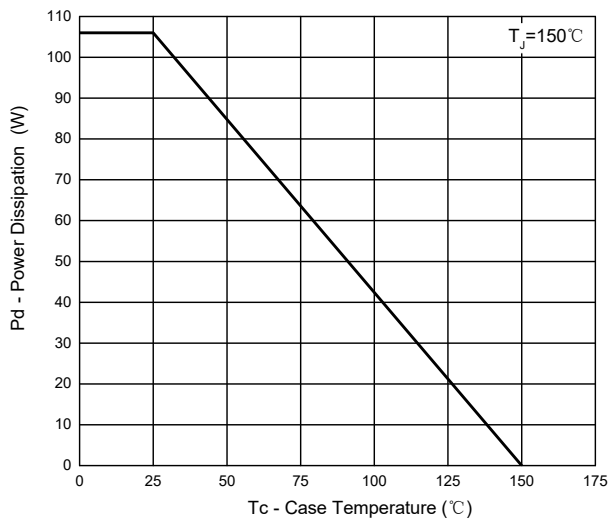
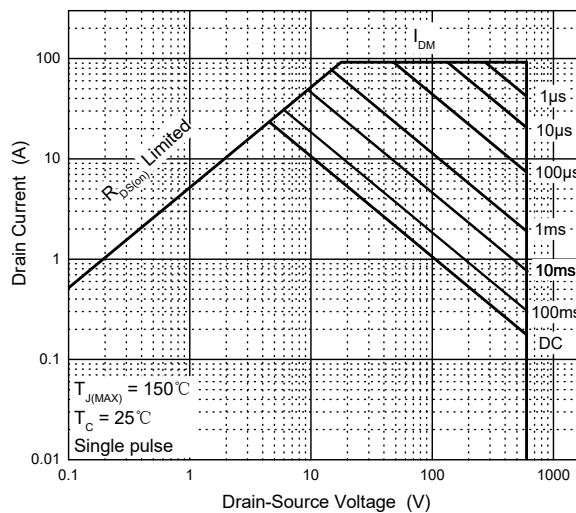
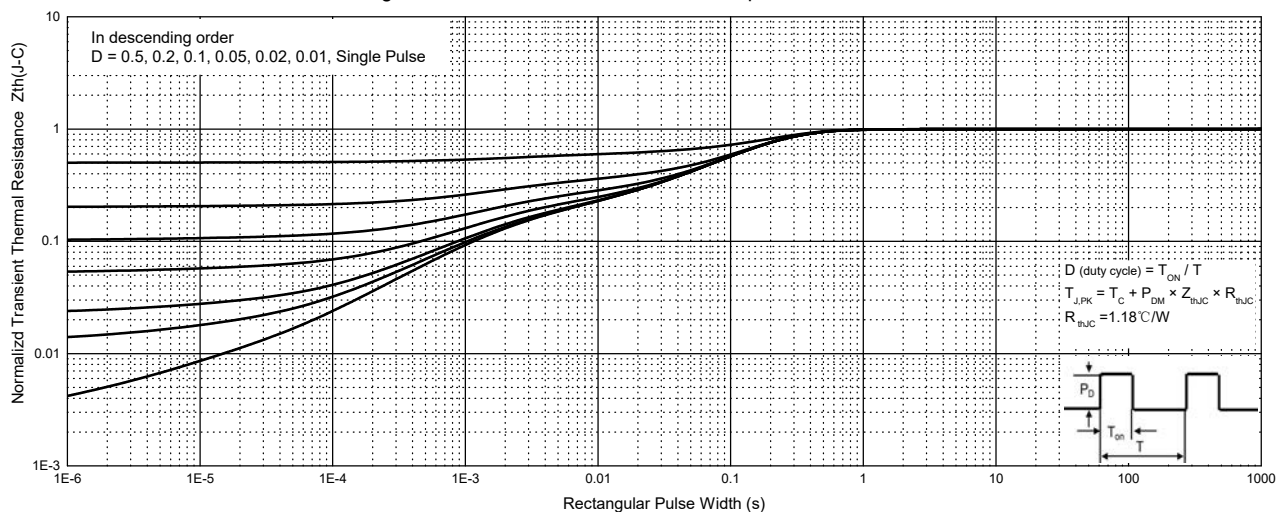


Fig. 12- Safe Operating Area



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-TP	Tape&Reel: 800pcs/Reel

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