

**Features**

- Split Gate Trench MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Design for Low  $R_{DS(ON)}$
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Moisture Sensitivity Level 1

**Maximum Ratings**

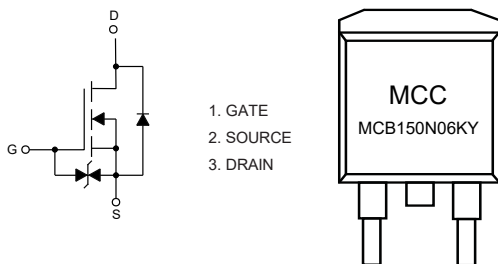
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 15°C/W Junction to Ambient( $t \leq 10S$ )<sup>(2)</sup>
- Thermal Resistance: 60°C/W Junction to Ambient(Steady-State)<sup>(2)</sup>
- Thermal Resistance: 0.85°C/W Junction to Case(Steady-State)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	150	A
Pulsed Drain Current <sup>(3)</sup>	$I_{DM}$	450	A
Total Power Dissipation	$P_D$	147	W
Single Pulsed Avalanche Energy <sup>(4)</sup>	$E_{AS}$	441	mJ

Note:

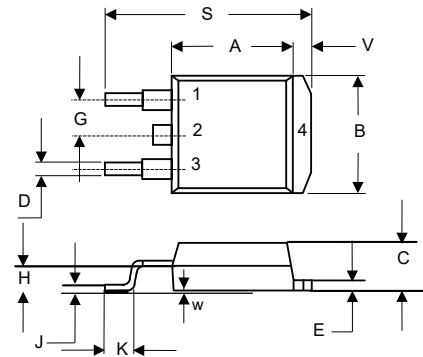
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ C$ . The Power dissipation  $P_{DSM}$  is based on  $R_{\theta JA}$   $t \leq 10s$  and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4.  $T_J = 25^\circ C$ ,  $V_{DD} = 50V$ ,  $L = 0.5mH$ ,  $I_{AS} = 42A$

**Internal Structure and Marking Code**



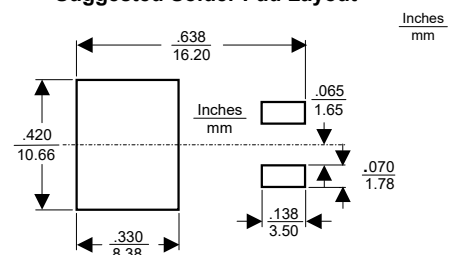
**N-CHANNEL MOSFET**

**D<sup>2</sup>-PAK(TO-263)**



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	0.010		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 @ 25°C (Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		2.7	3.5	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$		3.5	4.8	m $\Omega$
Gate Resistance	$R_G$	f=1MHz, Open drain		2		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				150	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=20A$		0.8	1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F=20A, dI_F/dt=500A/\mu s$		41.6		ns
Reverse Recovery Charge	$Q_{rr}$			39.8		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1MHz$		4650		pF
Output Capacitance	$C_{oss}$			850		
Reverse Transfer Capacitance	$C_{riss}$			65		
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=25A$		71		nC
Gate-Source Charge	$Q_{gs}$			17		
Gate-Drain Charge	$Q_{gd}$			10.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=30V, V_{GEN}=10V, R_G=2\Omega, I_{DS}=25A$		15.9		ns
Turn-On Rise Time	$t_r$			55.2		
Turn-Off Delay Time	$t_{d(off)}$			57.5		
Turn-Off Fall Time	$t_f$			91.3		

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

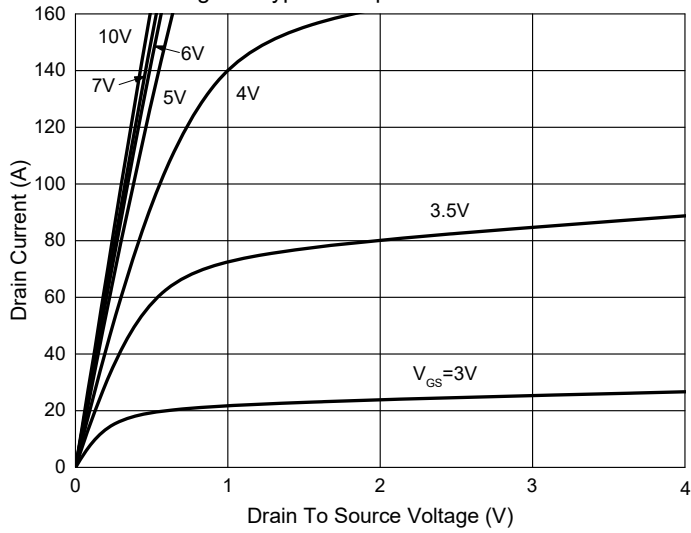


Fig. 2 - Transfer Characteristics

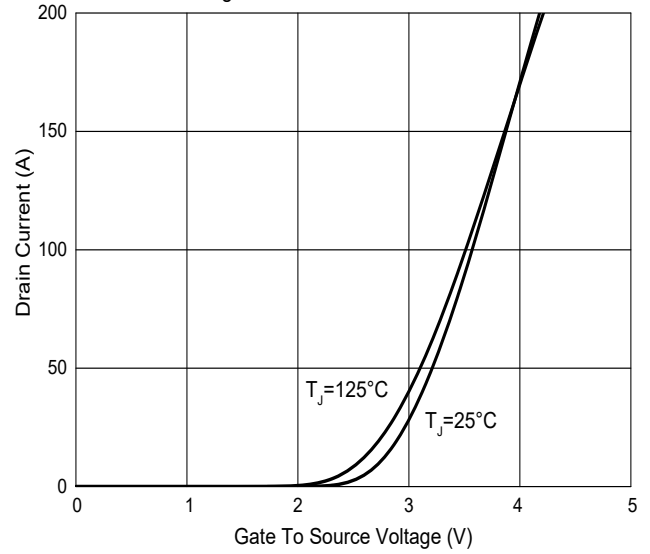


Fig. 3 -  $R_{DS(ON)} - I_D$

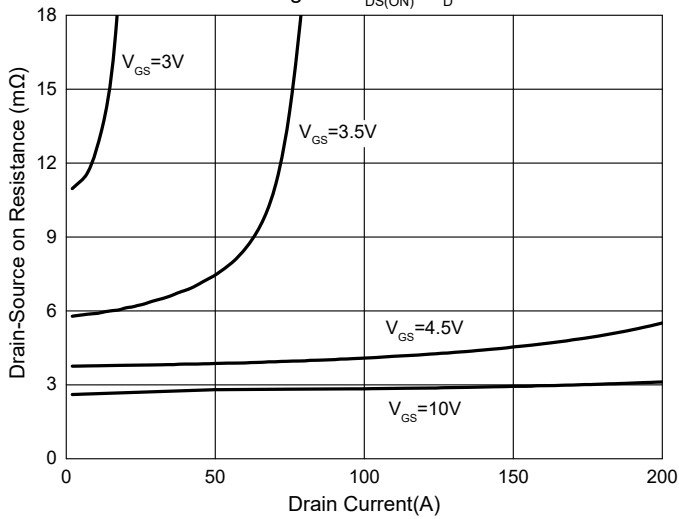


Fig. 4 - Drain-Source on Resistance

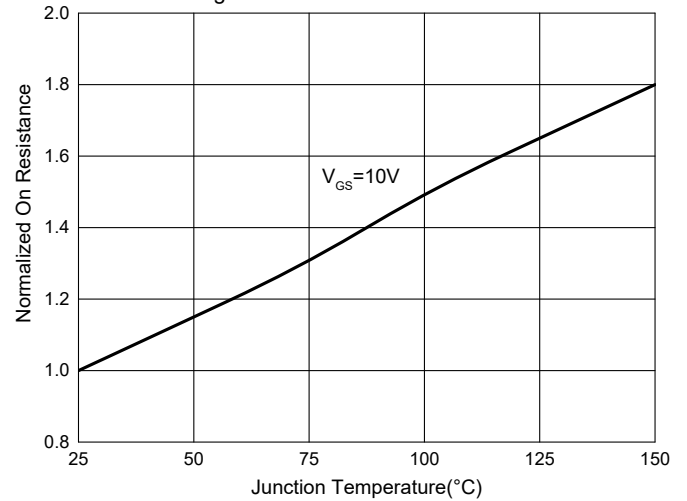


Fig. 5 - Capacitance Characteristics

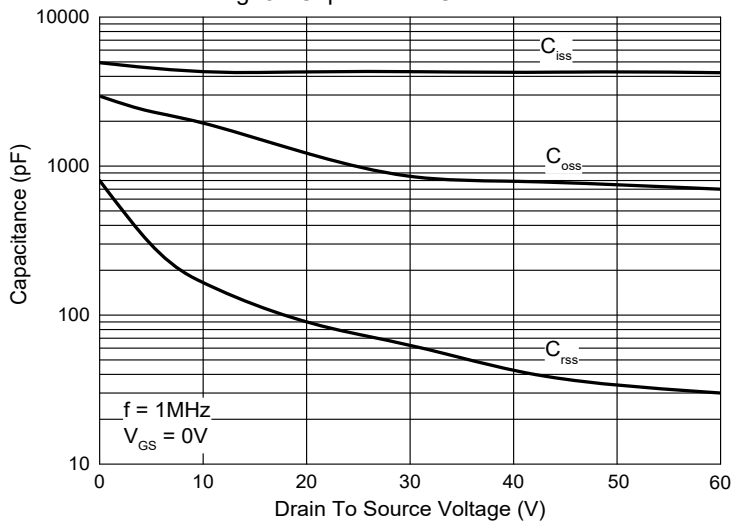
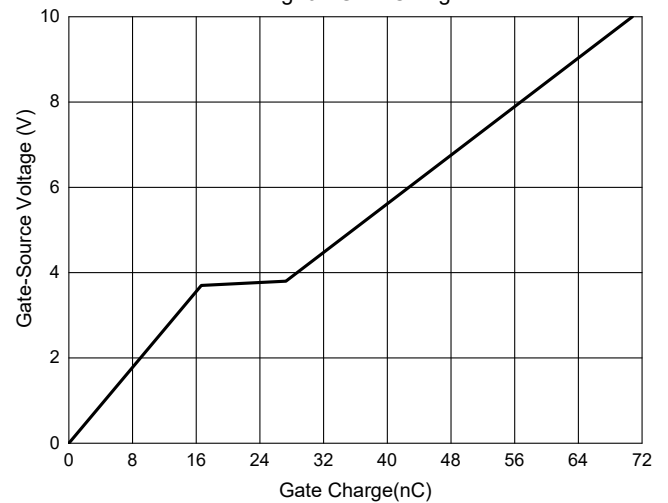
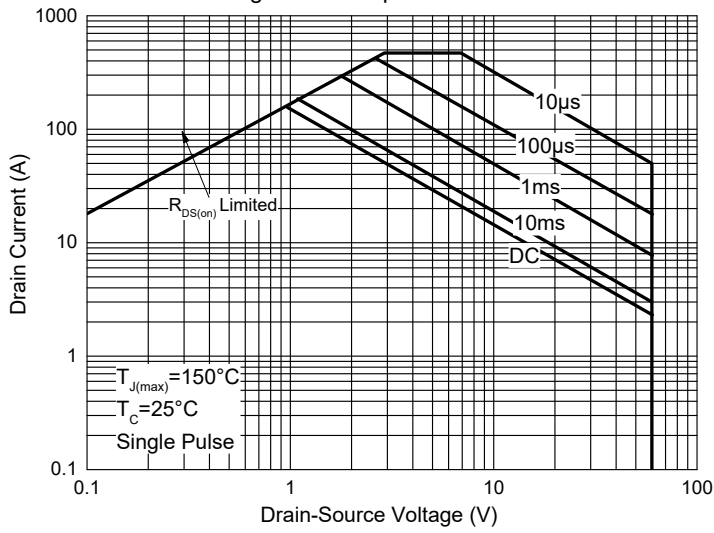


Fig. 6 - Gate Charge

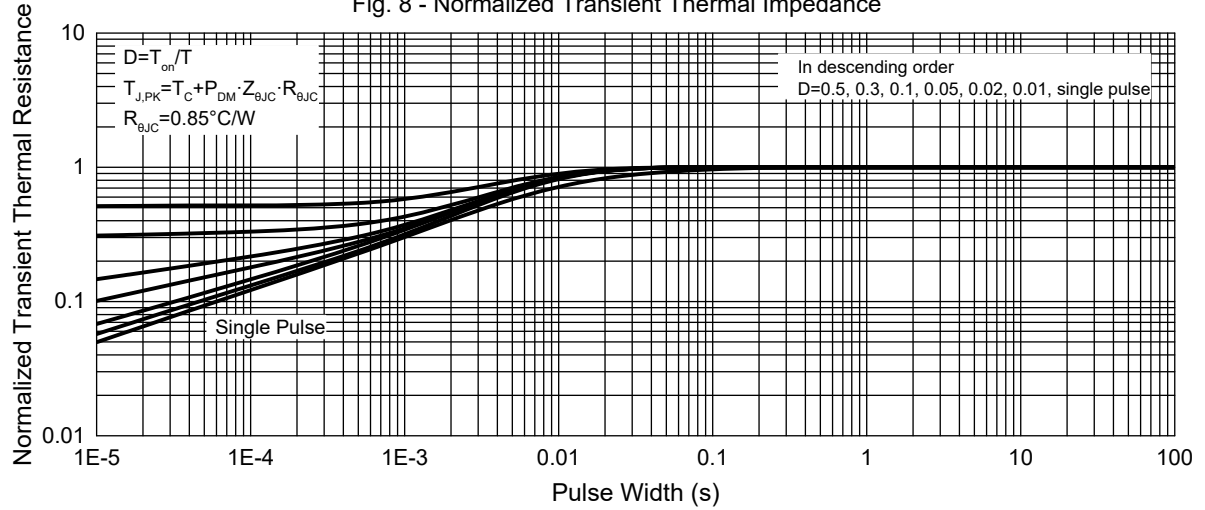


**Curve Characteristics**

**Fig. 7 - Safe Operation Area**



**Fig. 8 - Normalized Transient Thermal Impedance**



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 5Kpcs/Reel

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