

### Features

- Fast Switching
- Improved dv/dt Capability
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

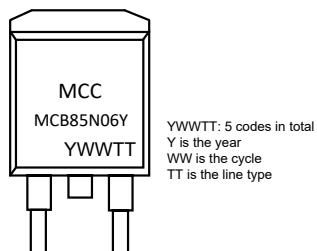
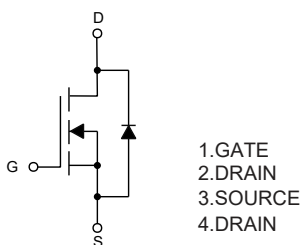
### Maximum Ratings

- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 1.76°C/W Junction to Case<sup>(Note 1)</sup>

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	85
		$T_C=100^\circ\text{C}$	59
Pulsed Drain Current	$I_{DM}$	150	A
Single Pulse Avalanche Energy <sup>(Note 2)</sup>	$E_{AS}$	290	mJ
Total Power Dissipation	$P_D$	85	W

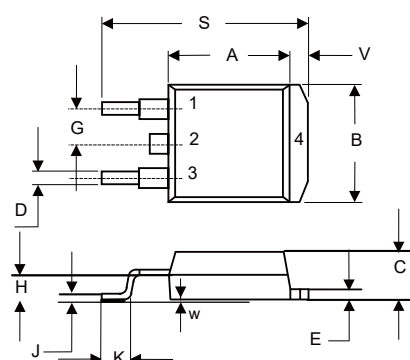
Note: 1.Surface Mounted on FR4 Board,  $t \leq 10$  sec.  
 2.EAS Condition:  $T_J=25^\circ\text{C}, V_{DD}=30\text{V}, V_G=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$ .

### Internal Structure and Marking Code



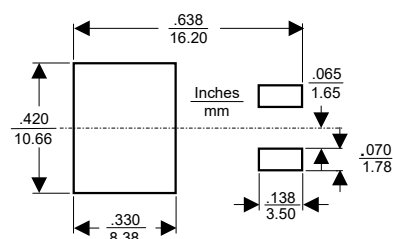
## N-CHANNEL MOSFET

### 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	0.010		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	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Threshold Voltage <sup>(Note 3)</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.6	2.4	V
Drain-Source On-Resistance <sup>(Note 3)</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$		11.3	13	m $\Omega$
Forward Transconductance <sup>(Note 3)</sup>	$g_{FS}$	$V_{DS}=10V, I_D=5.5A$	30			S
<b>Dynamic Characteristics<sup>(Note 4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		2498		pF
Output Capacitance	$C_{oss}$			185		
Reverse Transfer Capacitance	$C_{rss}$			80		
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=10V, I_D=30A$		36		nC
Gate-Source Charge	$Q_{gs}$			9.6		
Gate-Drain Charge	$Q_{gd}$			6.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=30V, I_D=2A, R_L=1\Omega$ $V_{GS}=10V, R_{GEN}=3\Omega$		12		ns
Turn-On Rise Time	$t_r$			5.2		
Turn-Off Delay Time	$t_{d(off)}$			38		
Turn-Off Fall Time	$t_f$			27		
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				85	A
Body Diode Voltage <sup>(Note 3)</sup>	$V_{SD}$	$I_S=20A, V_{GS}=0V$			1.4	V
Reverse Recovery Time	$t_{rr}$	$T_J=25^\circ C, I_F=30A,$ $di/dt=100A/\mu s$ <sup>(Note 3)</sup>		280		ns
Reverse Recovery Charge	$Q_{rr}$				2.8	
Forward Turn-On Time	$t_{on}$	Intrinsic Turn-On Time is Negligible (Turn-On is Dominated by LS+LD)				

Note 3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 1\%$ .

4. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

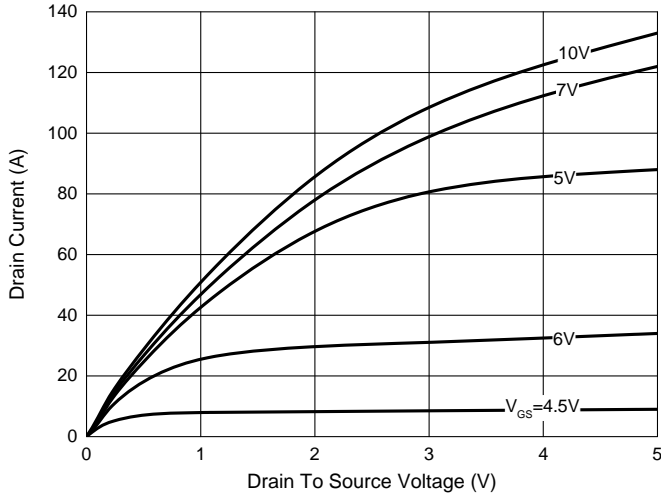


Fig. 2 - Transfer Characteristics

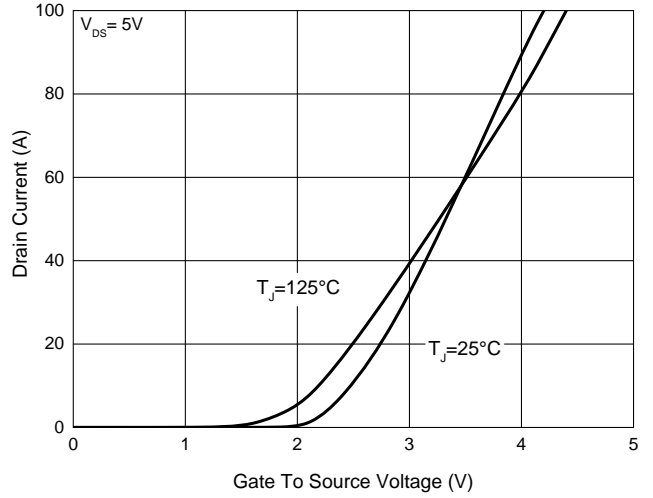


Fig. 3 - Capacitance Characteristics

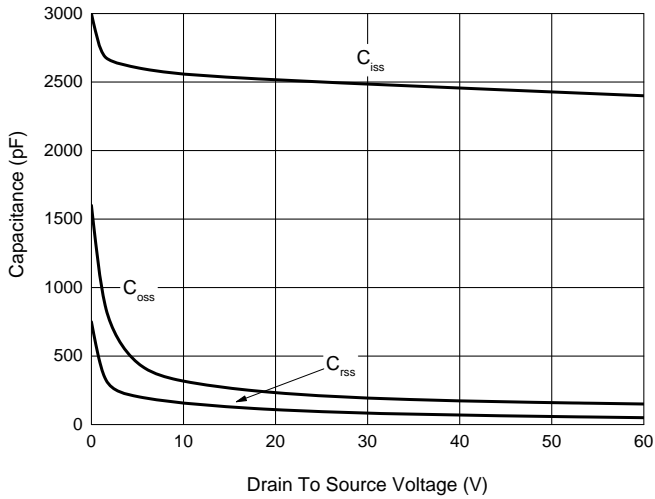


Fig. 4 - Gate Charge Characteristics

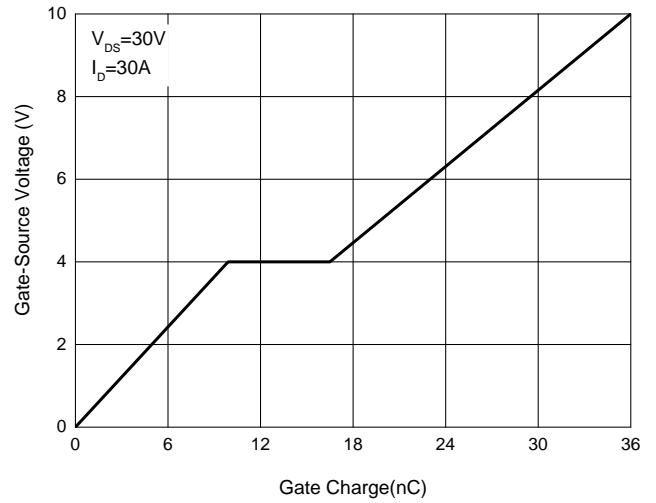


Fig. 5 -  $R_{DS(ON)} - I_D$

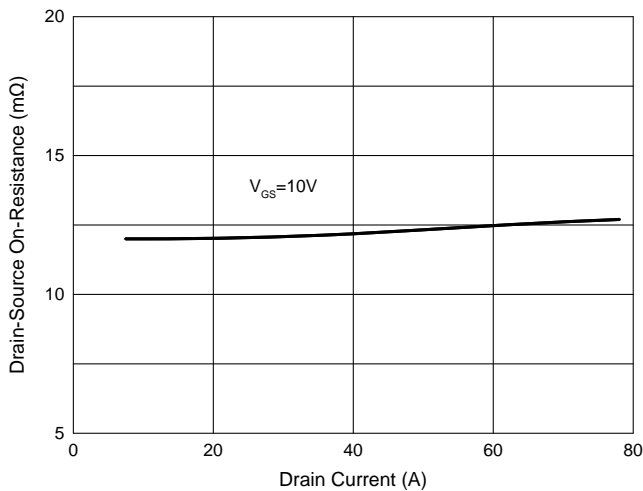
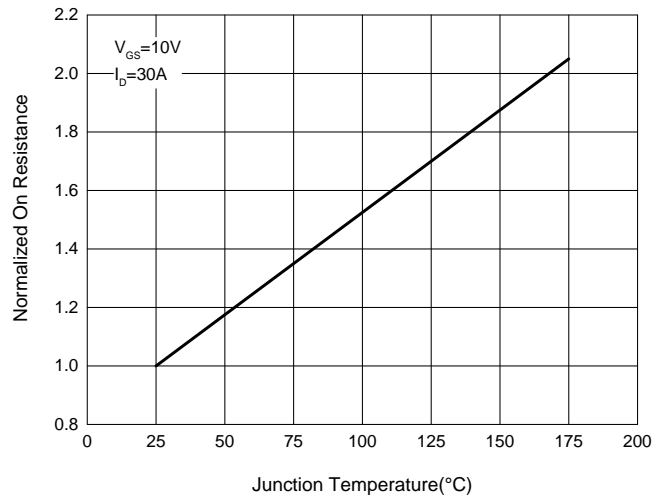


Fig. 6 - Normalized On Resistance Characteristics



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 800pcs/Reel

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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