

### Features

- High Density Cell Design for Ultra Low  $R_{DS(on)}$
- Fully Characterized Avalanche Voltage and Current
- Good Stability and Uniformity with High  $E_{AS}$
- 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

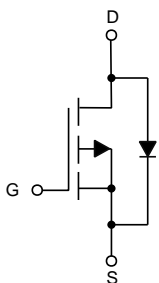
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 1.4°C/W Junction to Case<sup>(Note 1)</sup>

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	-60	V	
Gate-Source Voltage	$V_{GS}$	±20	V	
Continuous Drain Current	$I_D$	$T_C=25^\circ C$	-25	A
		$T_C=100^\circ C$	-17.7	A
Pulsed Drain Current	$I_{DM}$	-60	A	
Single Pulse Avalanche Energy <sup>(Note 2)</sup>	$E_{AS}$	300	mJ	
Total Power Dissipation	$P_D$	90	W	

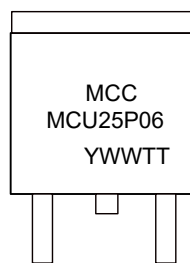
Note: 1.Surface Mounted on FR4 Board,  $t \leq 10$  sec.

2.  $T_J=25^\circ C, V_{DD}=-20V, V_G=-10V, L=1mH, R_g=25\Omega, I_{AS}=33A.$

### Internal Structure and Marking Code



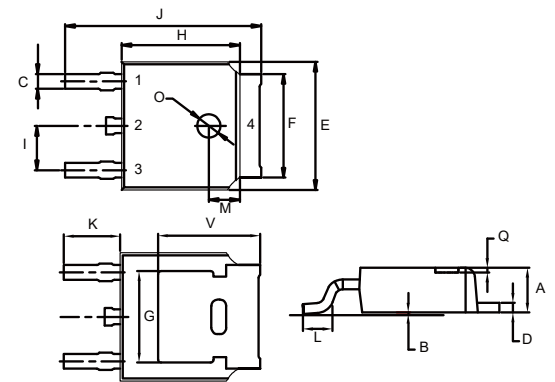
- 1.GATE
- 2.DRAIN
- 3.SOURCE
- 4.DRAIN



YWWTT: 5 codes in total  
Y is the year  
WW is the cycle  
TT is the line type

## P-CHANNEL MOSFET

### DPAK



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.087	0.094	2.20	2.40	
B	0.000	0.005	0.00	0.13	
C	0.026	0.034	0.66	0.86	
D	0.018	0.023	0.46	0.58	
E	0.256	0.264	6.50	6.70	
F	0.201	0.215	5.10	5.46	
G	0.190		4.83		TYP.
H	0.236	0.244	6.00	6.20	
I	0.086	0.094	2.18	2.39	
J	0.386	0.409	9.80	10.40	
K	0.114		2.90		TYP.
L	0.055	0.067	1.40	1.70	
M	0.063		1.60		TYP.
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
V	0.211		5.35		TYP.

**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>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2	-2.9	-3.5	V
Drain-Source On-Resistance <sup>(Note 3)</sup>	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		39	45	m $\Omega$
Forward Transconductance <sup>(Note 3)</sup>	$g_{FS}$	$V_{DS}=-10V, I_D=-10A$		25		S
<b>Dynamic Characteristics<sup>(Note 4)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V, f=1MHz$		3430		pF
Output Capacitance	$C_{oss}$			391		
Reverse Transfer Capacitance	$C_{rss}$			272		
Total Gate Charge	$Q_g$	$V_{DS}=-30V, V_{GS}=-10V, I_D=-20A$		46		nC
Gate-Source Charge	$Q_{gs}$			9.5		
Gate-Drain Charge	$Q_{gd}$			10.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-30V, R_L=1.5\Omega, V_{GS}=-10V, R_G=3\Omega$		12		ns
Turn-On Rise Time	$t_r$			15		
Turn-Off Delay Time	$t_{d(off)}$			38		
Turn-Off Fall Time	$t_f$			15		
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C=25^\circ C$			-25	A
Body Diode Voltage	$V_{SD}$	$I_{SD}=-10A, V_{GS}=0V$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J=25^\circ C, I_F=-10A, di/dt=-100A/\mu s$		47		ns
Reverse Recovery Charge	$Q_{rr}$				53	
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  $\leq 2\%$ .

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

## Curve Characteristics

Fig. 1 - Typical Output Characteristics

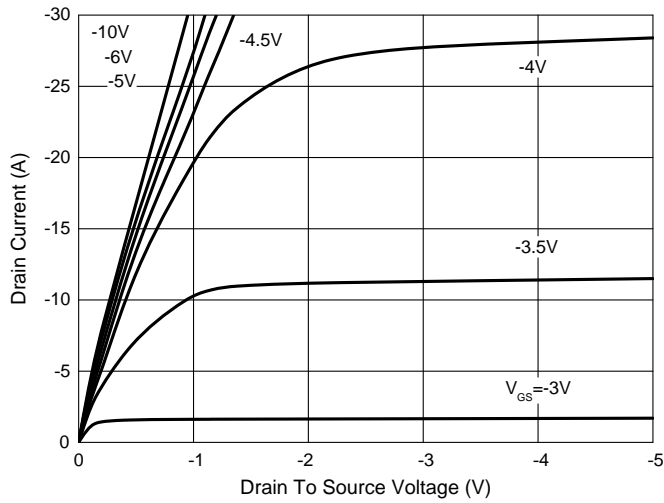


Fig. 2 - Transfer Characteristics

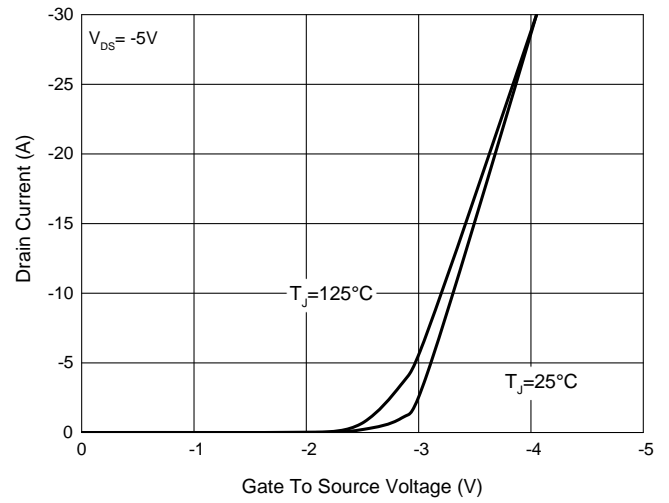


Fig. 3 -  $R_{DS(ON)} - I_D$

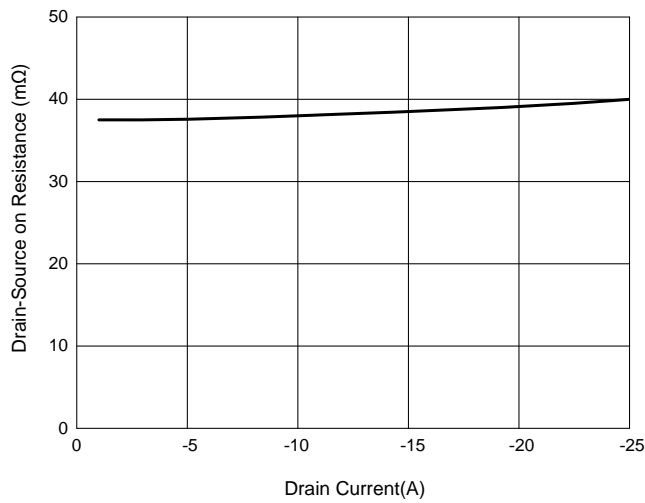


Fig. 4 - Normalized On Resistance Characteristics

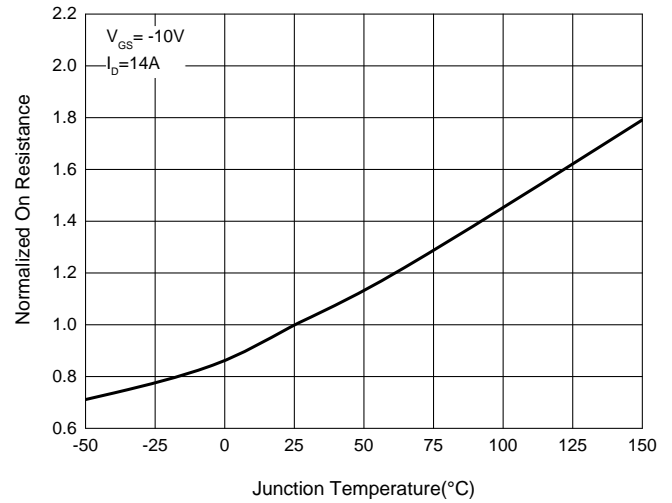


Fig. 5 - Capacitance Characteristics

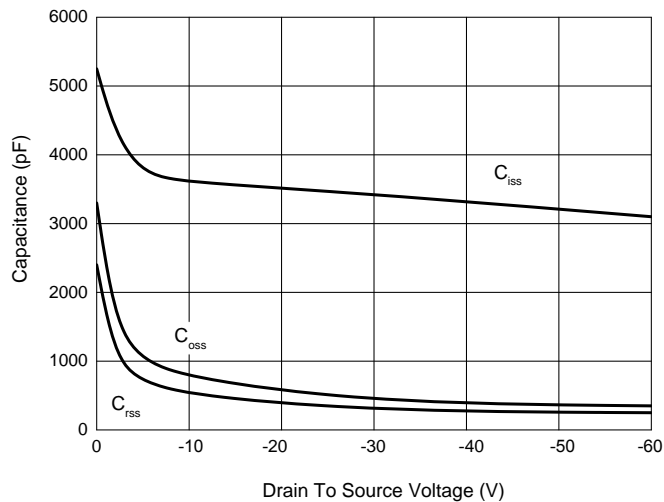
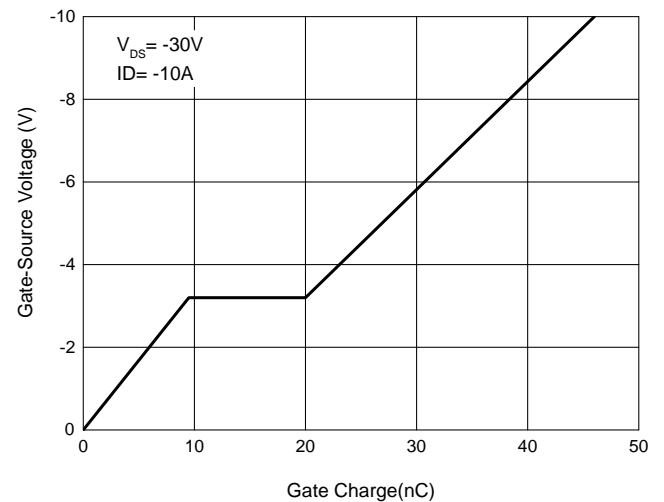


Fig. 6 - Gate Charge Characteristics



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 2.5Kpcs/Reel

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

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