

## Features

- Trench Power LV MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Design for Low RDS(ON)
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings

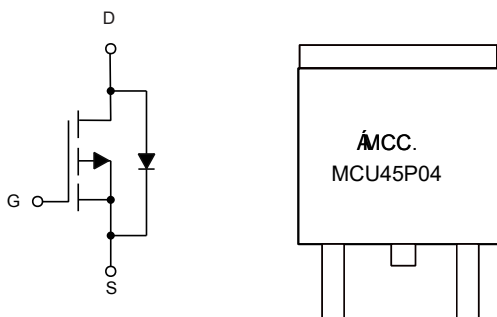
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 1.8°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-40	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	-45	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	-180	A
Total Power Dissipation <sup>(2)</sup>	$P_D$	70	W
Single Pulsed Avalanche Energy <sup>(3)</sup>	$E_{AS}$	240	mJ

Note:

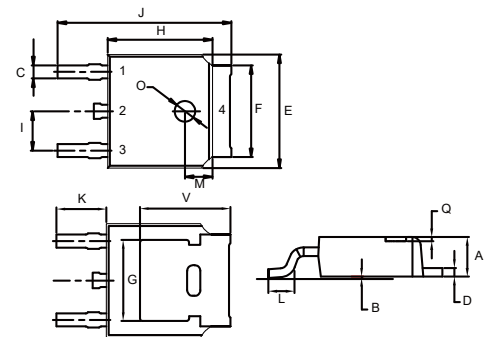
1. Repetitive rating; pulse width limited by max. junction temperature.
2.  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
3.  $V_{DD}=-30V$ ,  $V_{GS}=-10V$ ,  $L=0.5mH$ ,  $I_{AS}=31A$ .

## Internal Structure and Marking Code



# P-CHANNEL MOSFET

## DPAK(TO-252)



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

DIM	DIMENSIONS				NOTE
	INCHES		MM		
	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-40			V
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-40V, V_{GS}=0V$			-1	$\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-1.6	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$		10.3	14	m $\Omega$
		$V_{GS}=-4.5V, I_D=-15A$		13.9	19	
Gate Resistance	$R_g$	f=1MHz, Open drain		7.5		$\Omega$
<b>Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$				-45	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-20A$			-1.3	V
Reverse Recovery Time	$t_{rr}$	$I_S=-20A, di_F/dt=100A/\mu s$		22		ns
Reverse Recovery Charge	$Q_{rr}$			6.8		nC
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-20V, V_{GS}=0V, f=1MHz$		2451		pF
Output Capacitance	$C_{oss}$			243		
Reverse Transfer Capacitance	$C_{riss}$			202		
Total Gate Charge	$Q_g$	$V_{DS}=-20V, V_{GS}=-10V, I_D=-20A$		52.2		nC
Gate-Source Charge	$Q_{gs}$			9.7		
Gate-Drain Charge	$Q_{gd}$			11		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-20V, V_{GEN}=-10V, R_G=3\Omega, I_{DS}=-20A$		8.6		ns
Turn-On Rise Time	$t_r$			46.8		
Turn-Off Delay Time	$t_{d(off)}$			96.4		
Turn-Off Fall Time	$t_f$			68.2		

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

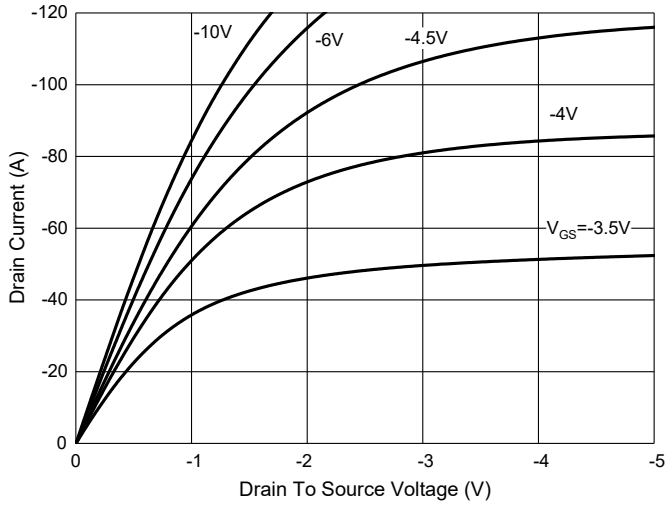


Fig. 2 - Transfer Characteristics

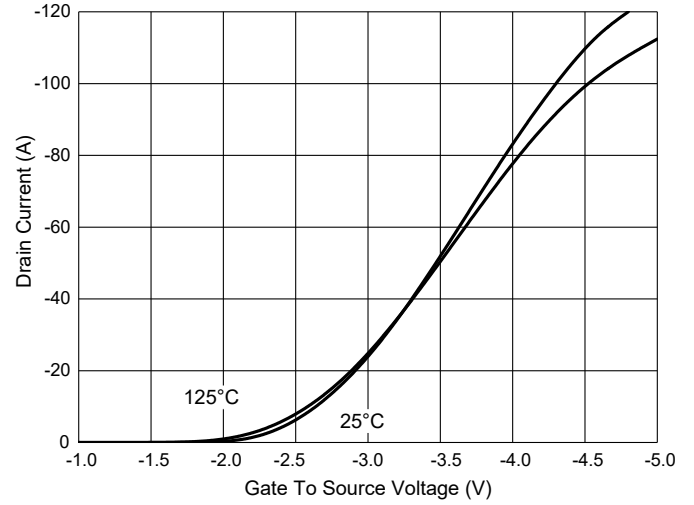


Fig. 3 -  $R_{DS(ON)} - I_D$

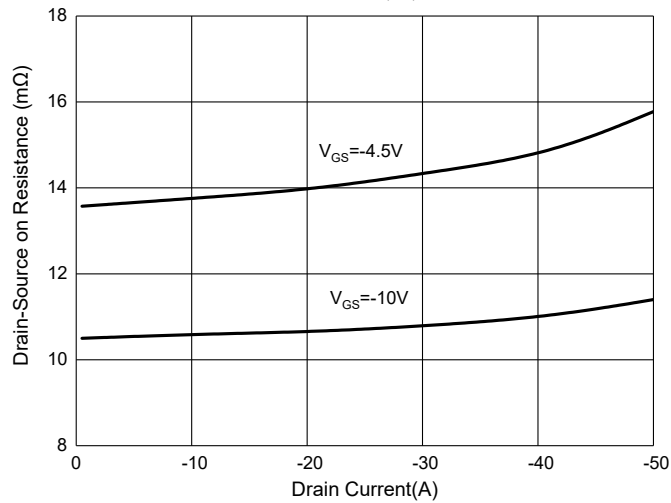


Fig. 4 - Normalized On Resistance Characteristics

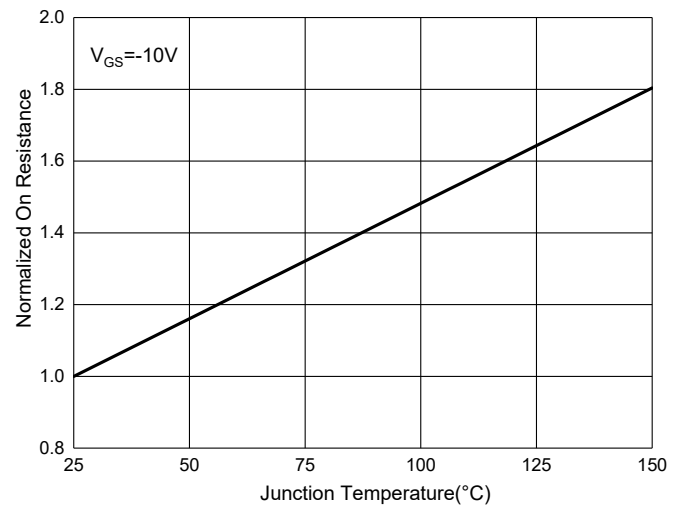


Fig. 5 - Capacitance Characteristics

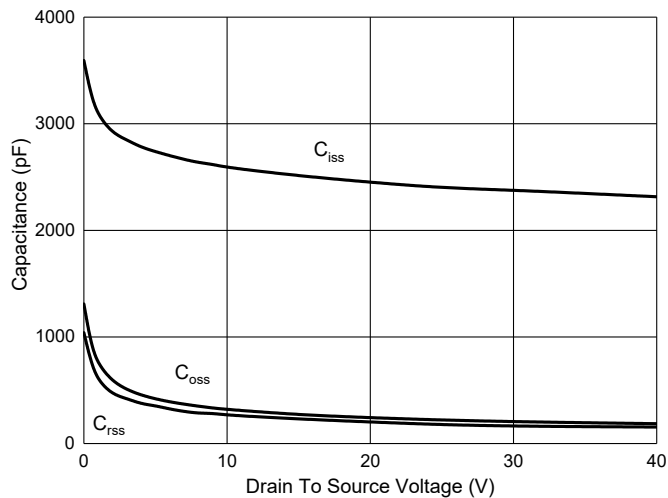
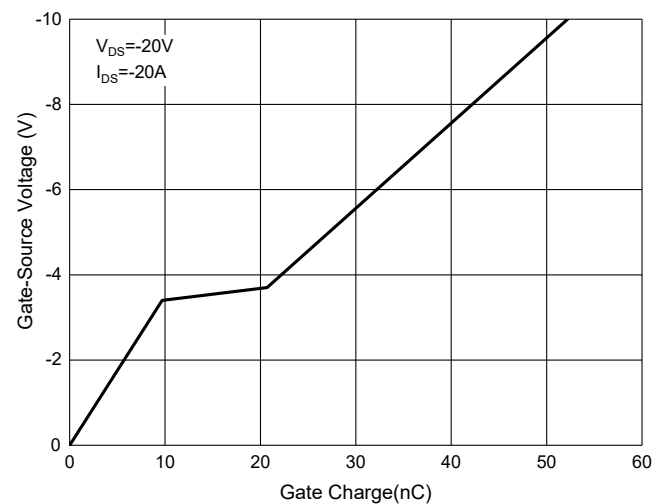


Fig. 6 - Gate Charge



## 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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