

Features

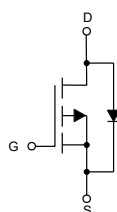
- High Density Cell Design for Ultra Low $R_{DS(ON)}$
- Trench Power LV MOSFET Technology
- High Speed Switching
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

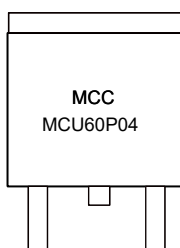
- Operating Junction Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Storage Temperature Range: -55°C to $+150^{\circ}\text{C}$
- Thermal Resistance: 1.14°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain -Source Voltage	V_{DS}	-40	V
Gate -Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-60	A
Drain Current-Pulsed	I_{DM}	-200	A
Single Pulsed Avalanche Energy ^(Note1)	E_{AS}	220	mJ
Power Dissipation	P_D	110	W

Internal Structure and Marking Code

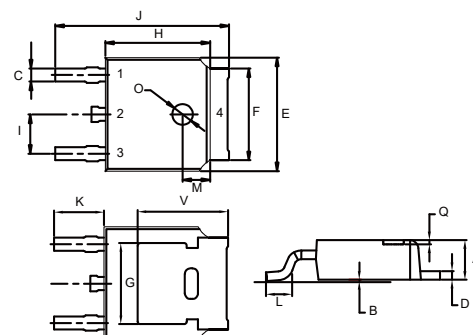


- 1.GATE
- 2.DRAIN
- 3.SOURCE
- 4.DRAIN



P-Channel MOSFET

DPAK



DIMENSIONS					
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 (Ta=25°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 =-250μA	-40			V
Gate-Threshold Voltage ^(Note2)	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.2	-1.8	-2.8	V
Gate-Body Leakage Current	I _{GSS}	V _{GS} =± 25V, V _{DS} =0V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V			-1	μA
Drain-Source On-Resistance ^(Note2)	R _{DS(on)}	V _{GS} =-10V, I _D =-20A		6	8	mΩ
		V _{DS} =-4.5V, I _D =-18A		10	12	
Gate Resistance	R _g	f=1MHz, Open Drain		14		Ω
Dynamic Characteristics ^(Note3)						
Input Capacitance	C _{iss}	V _{DS} =-20V,V _{GS} =0V, f=1MHz		5235		pF
Output Capacitance	C _{oss}			490		
Reverse Transfer Capacitance	C _{rss}			430		
Switching Characteristics ^(Note3)						
Total Gate Charge	Q _g	V _{DS} =-20V,V _{GS} =-10V,I _D =-20A		97		nC
Gate-Source Charge	Q _{gs}			22		
Gate-Drain Charge	Q _{gd}			22		
Turn-on Delay Time	t _{d(on)}	V _{DD} =-20V,V _{GS} =-10V,I _D =-20A, R _{GEN} =2Ω		11		nS
Turn-on Rise Time	t _r			55		
Turn-off Delay Time	t _{d(off)}			115		
Turn-off Fall Time	t _f			245		
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 2)	V _{SD}	V _{GS} =0V,I _S =-20A			-1.2	V
Diode Forward Current ^(Note 4)	I _S				-60	A
Reverse Recovery Time	t _{rr}	T _J =25°C,I _F =-20A, di/dt=-100a/us ^(Note2)		31		nS
Reverse Recovery Time	Q _{rr}			20		nC

Notes:

1. E_{AS} Condition: $V_{DD}=-40V, L=1mH, V_{GS}=-10V, T_J=25^\circ C$
2. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. Guaranteed by Design, Not Subject to Production.
4. Surface Mounted on FR4 Board, $t \leq 10$ sec.

Curve Characteristics

Fig. 1 - Typical Output Characteristics

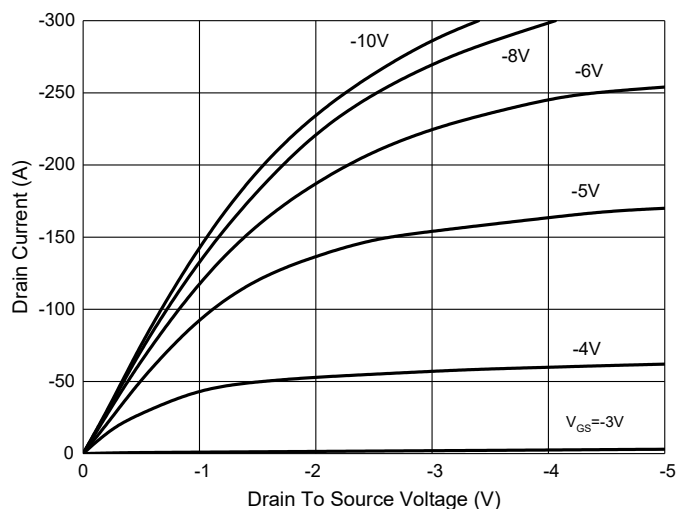


Fig. 2 - Transfer Characteristics

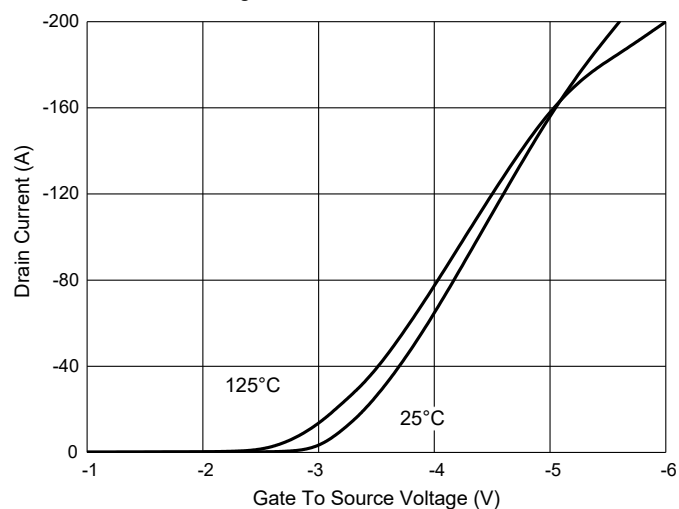


Fig. 3 - $R_{DS(ON)} - I_D$

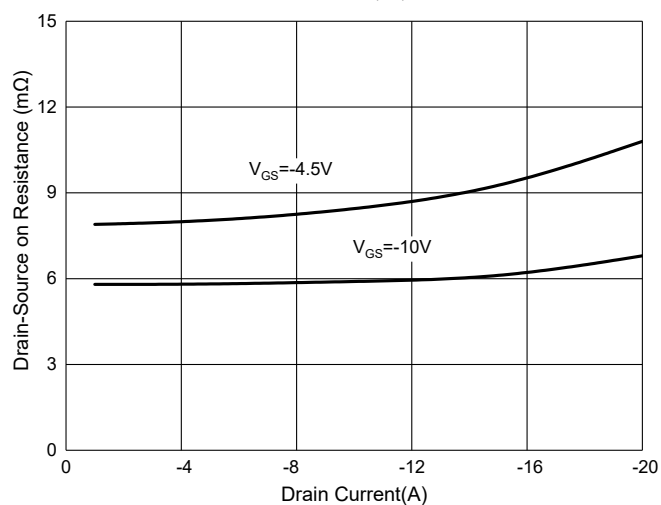


Fig. 4 - Normalized On Resistance Characteristics

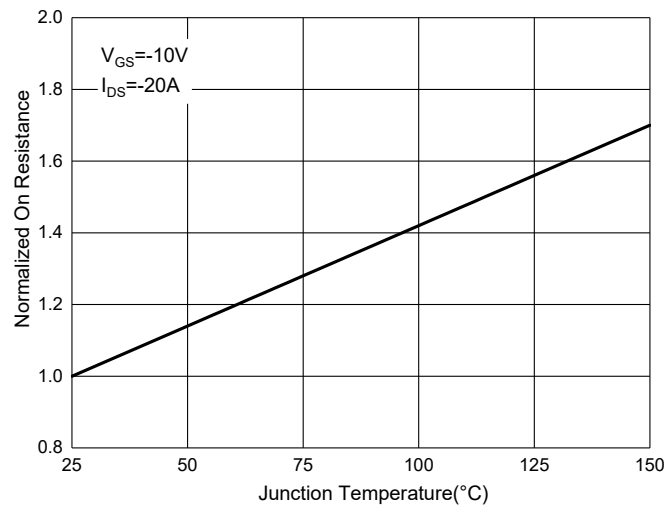


Fig. 5 - Capacitance Characteristics

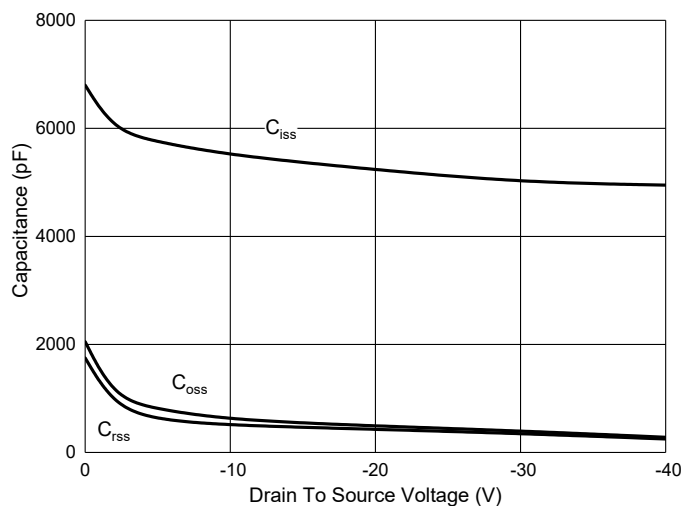
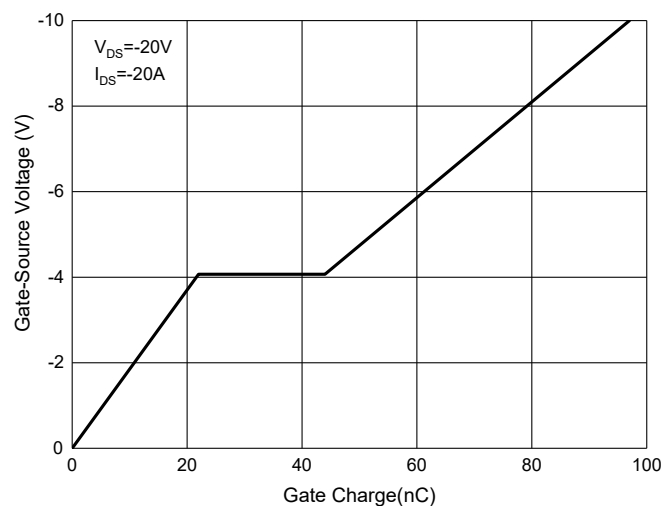


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Safe Operation Area

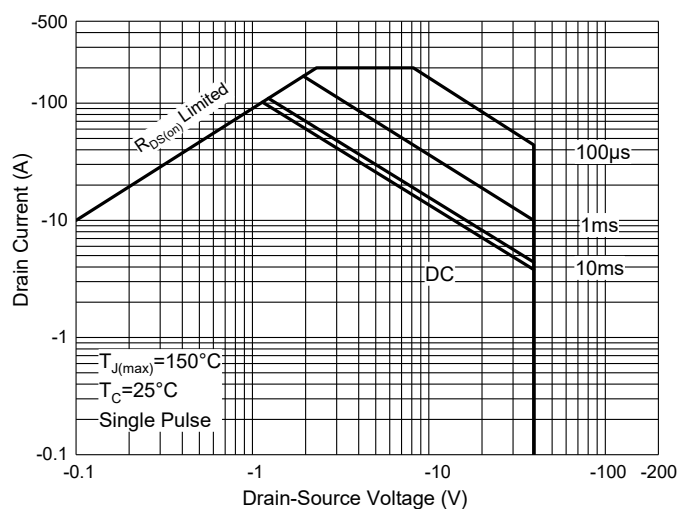
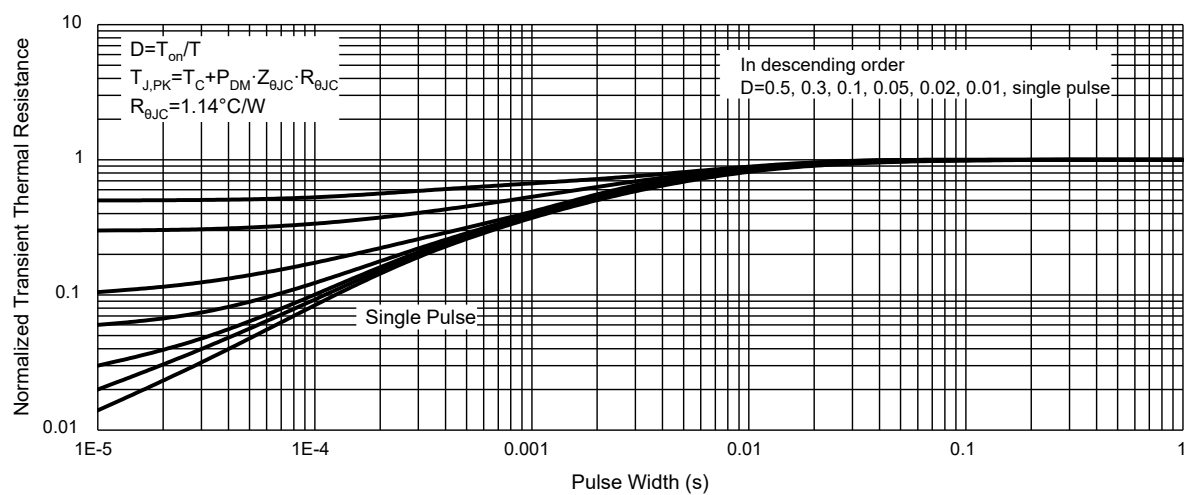


Fig. 8 - Normalized Transient Thermal Impedance



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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