

Features

- Trench LV MOSFET Technology
- ESD HBM Class 2
- Fast Switching Speed
- Moisture Sensitivity Level 1
- 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)

Maximum Ratings

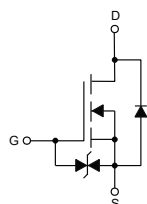
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 123°C/W Junction to Ambient (Note 2)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	20	V
Gate-Source Voltlage		V _{GS}	±12	V
Continuous Drain Current	T _A =25°C	I _D	1.4	A
	T _A =70°C		1.1	
Pulsed Drain Current ^(Note 3)		I _{DM}	5.6	A
Total Power Dissipation ^(Note 4)		P _D	1.0	W

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 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-ambient thermal resistance.

Internal Structure and Marking Code

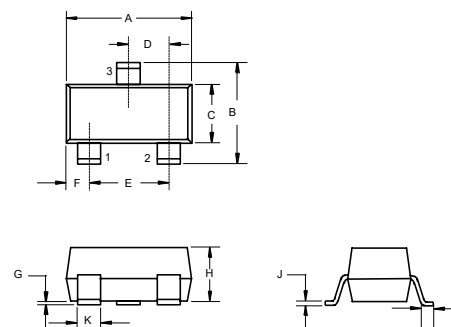


1. GATE
2. SOURCE
3. DRAIN



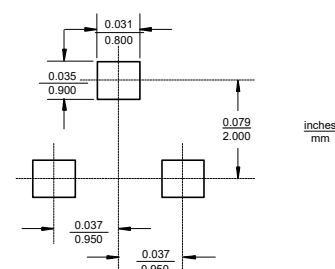
N-Channel MOSFET

SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.012	0.020	0.30	0.51	
L	0.007	0.020	0.20	0.50	

Suggested Solder Pad Layout



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	20			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.75	0.9	V
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±10	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =500mA		190	300	mΩ
		V _{GS} =2.5V, I _D =400mA		280	400	
		V _{GS} =1.8V, I _D =200mA		440	700	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =750mA		1.7		S
Gate Resistance	R _g	f=1 MHz, Open drain		37		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				1.4	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =500mA			1.2	V
Reverse Recovery Time	t _{rr}	I _F =500mA, dI _F /dt=100A/μs		12		ns
Reverse Recovery Charge	Q _{rr}			0.6		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =16V,V _{GS} =0V,f=1MHz		27		pF
Output Capacitance	C _{oss}			9.3		
Reverse Transfer Capacitance	C _{rss}			4.5		
Total Gate Charge	Q _g	V _{DS} =10V,V _{GS} =4.5V,I _D =500mA		1		nC
Gate-Source Charge	Q _{gs}			0.25		
Gate-Drain Charge	Q _{gd}			0.23		
Turn-On Delay Time	t _{d(on)}	V _{DD} =10V,V _{GS} =10V, R _G =3Ω, I _D =500mA		2		ns
Turn-On Rise Time	t _r			17		
Turn-Off Delay Time	t _{d(off)}			7		
Turn-Off Fall Time	t _f			4		

Curve Characteristics

Fig.1 - Typical Output Characteristics

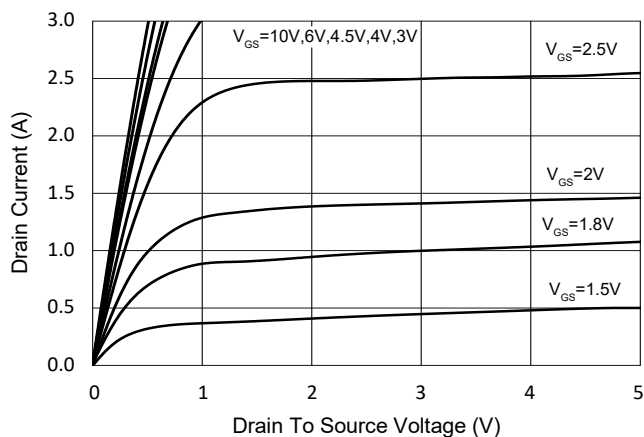


Fig.2 - Transfer Characteristic

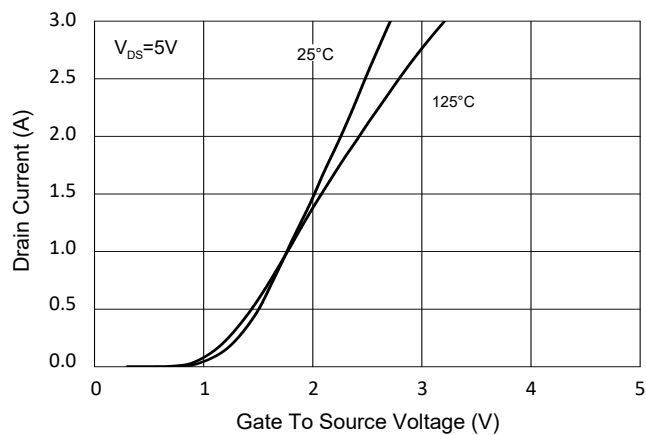


Fig.3 - $R_{DS(ON)}$ - V_{GS}

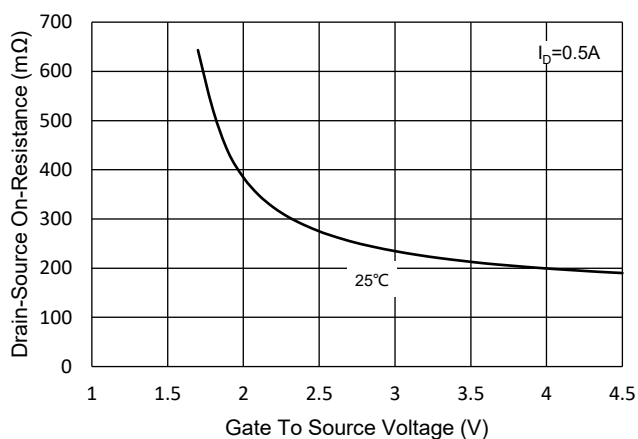


Fig.4 - $R_{DS(ON)}$ - I_D

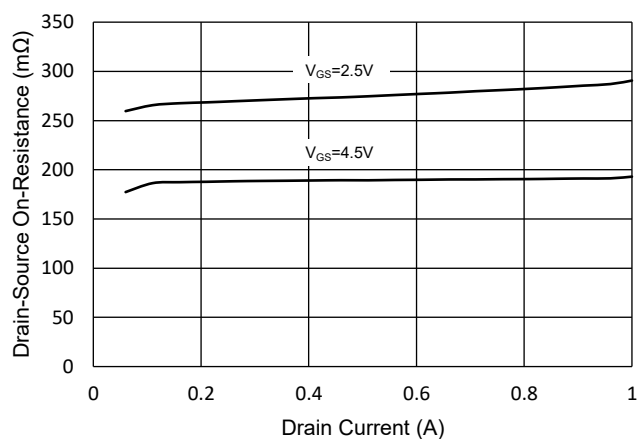


Fig.5 - Capacitance Characteristics

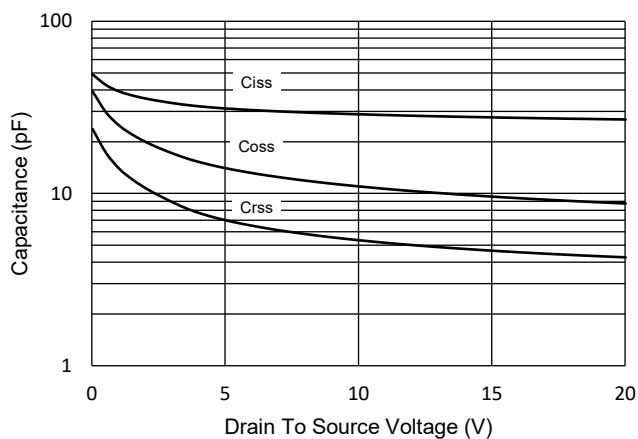
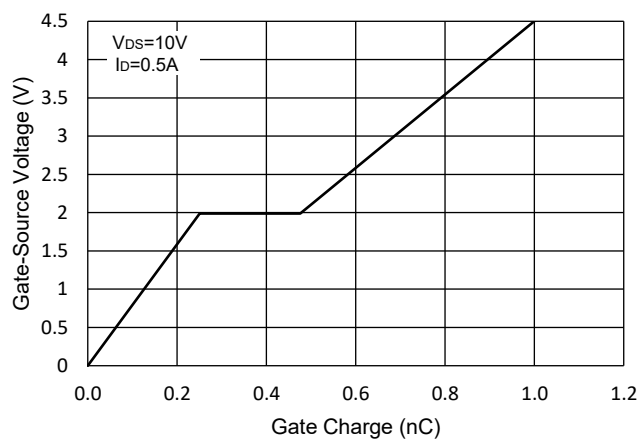


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

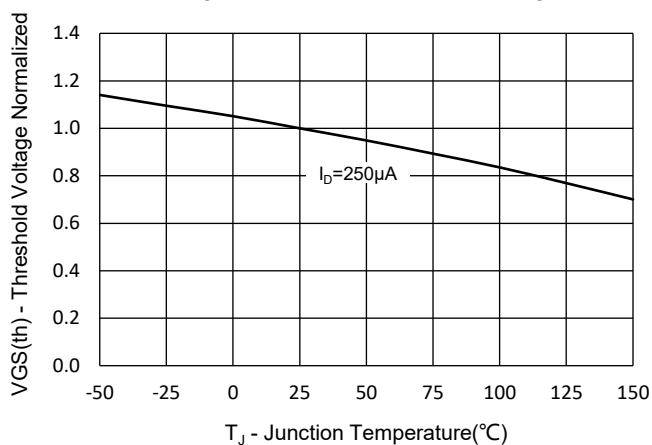


Fig.8 - Normalized On Resistance Characteristics

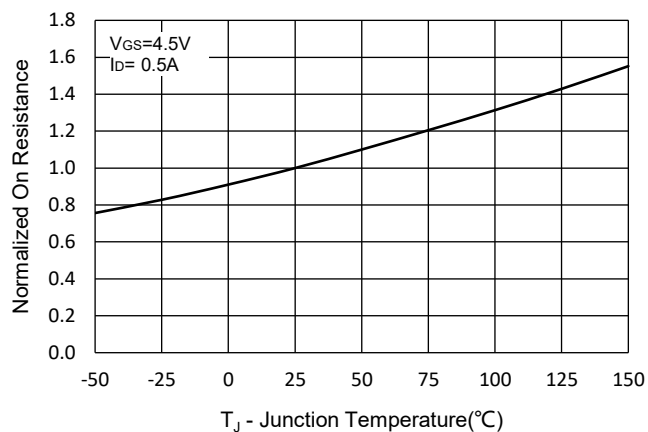


Fig.9 - $I_S - V_{SD}$

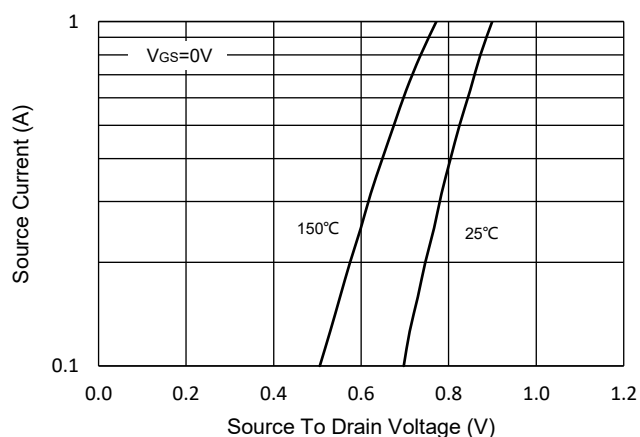


Fig. 10 - Drain Current

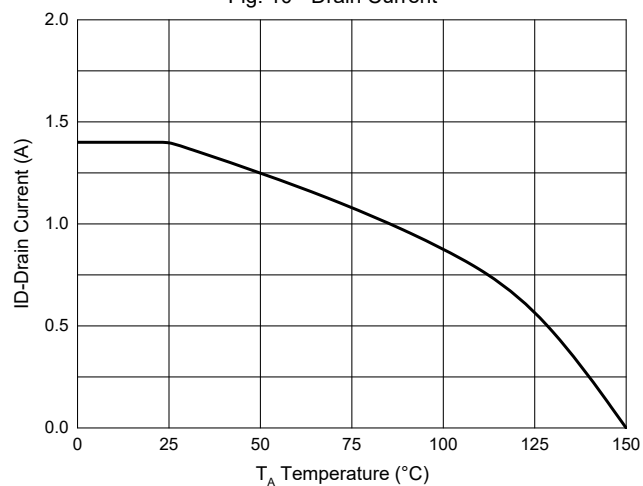
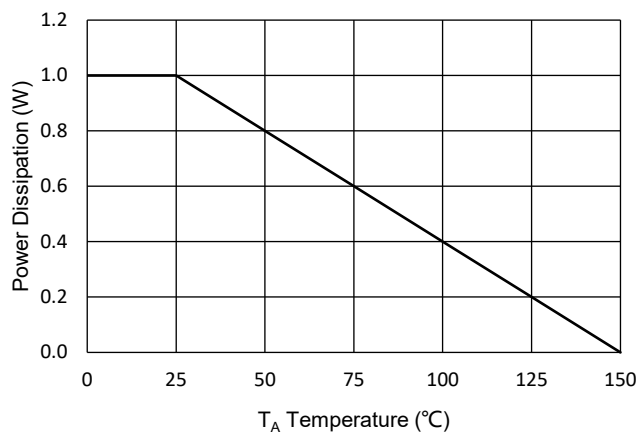


Fig.11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

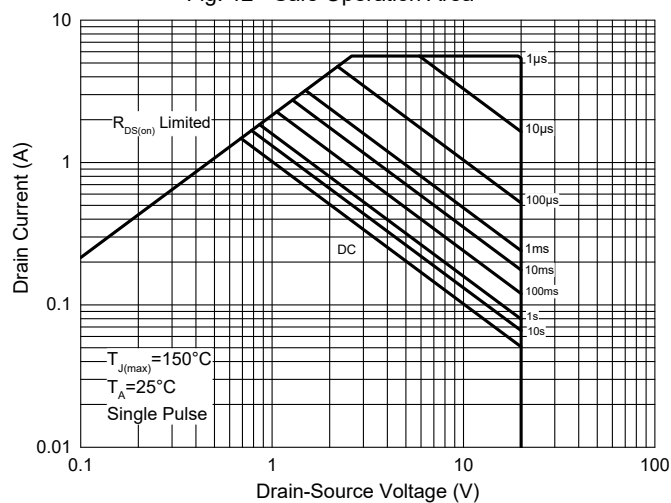
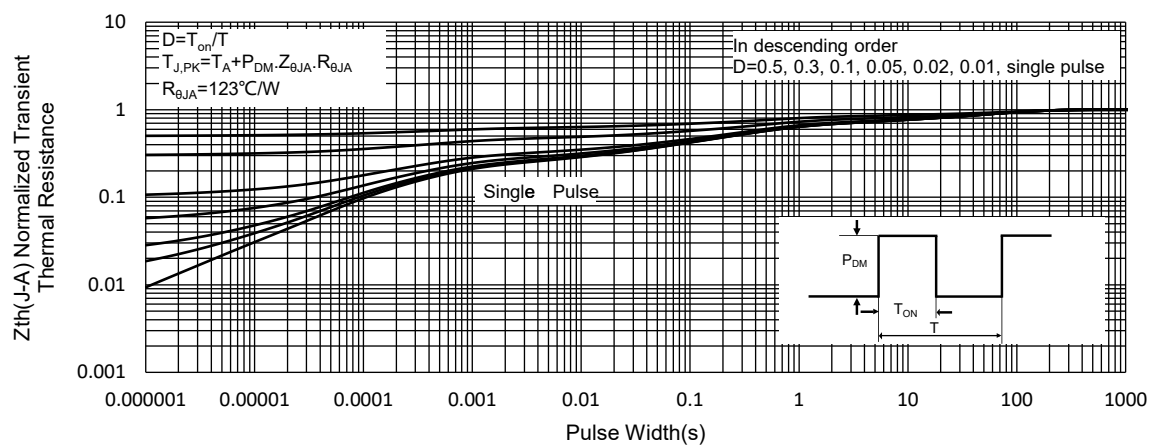


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:3Kpcs/Reel
Part Number-13P	Tape&Reel:10Kpcs/Reel

For packaging details, go to our website at <https://www.mccsemi.com/pdf/productpackaging/SOT-23%20Package.pdf>

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