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)

N-Channel MOSFET

Maximum Ratings

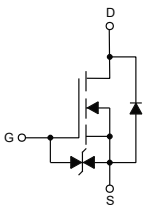
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 123°C/W Junction to Ambient(Note 2)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Volltage		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

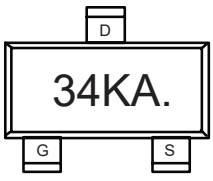
Note:

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 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°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.

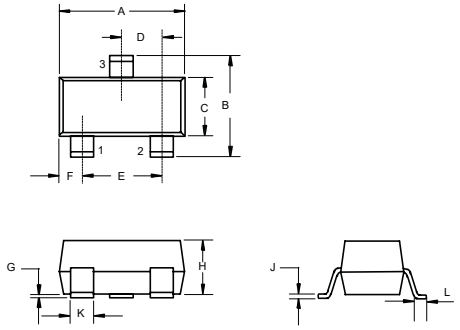
Internal Structure and Marking Code



1. GATE
2. SOURCE
3. DRAIN

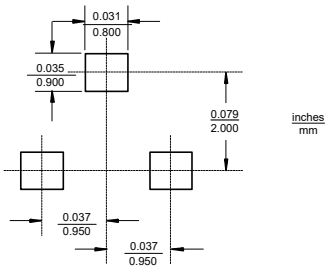


SOT-23



DIMENSIONS					
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℃ 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

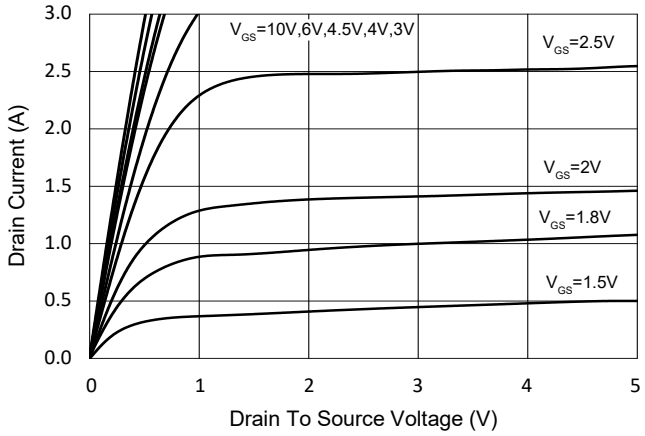


Fig.2 - Transfer Characteristic

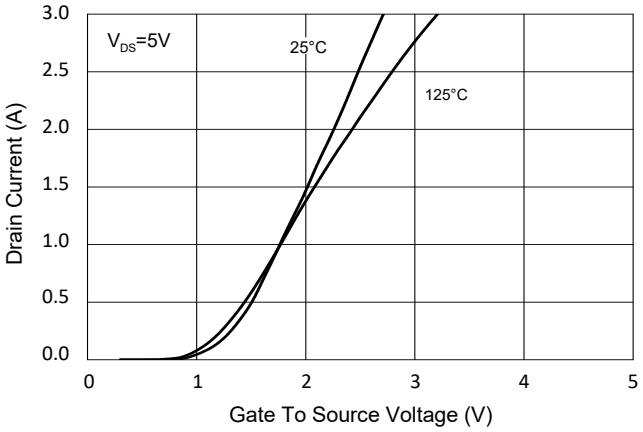


Fig.3 - $R_{DS(ON)}$ - V_{GS}

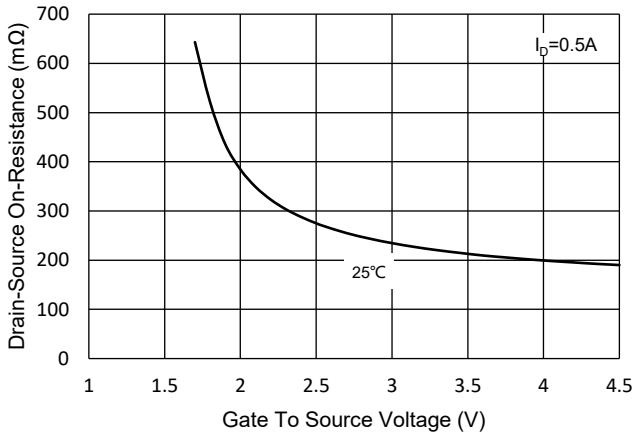


Fig.4 - $R_{DS(ON)}$ - I_D

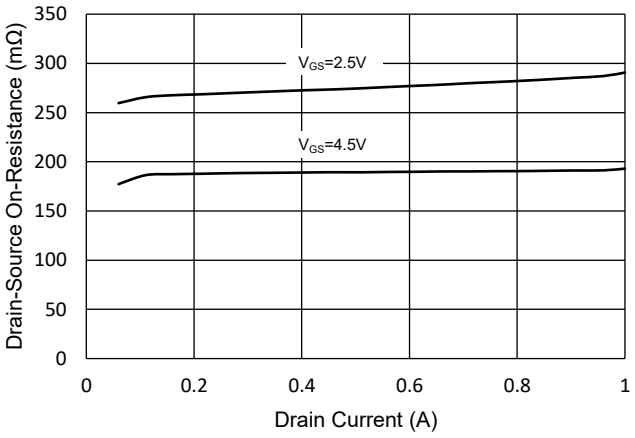


Fig.5 - Capacitance Characteristics

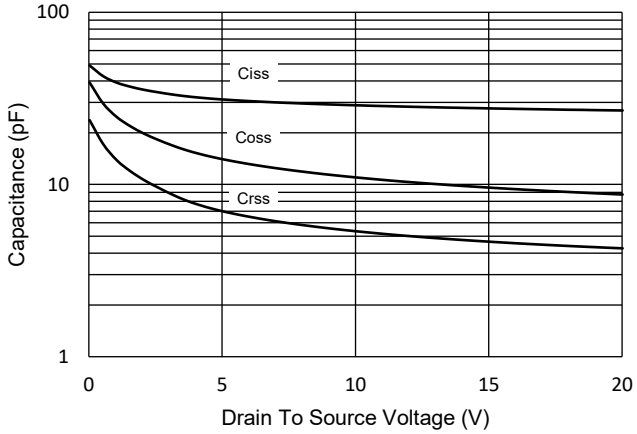
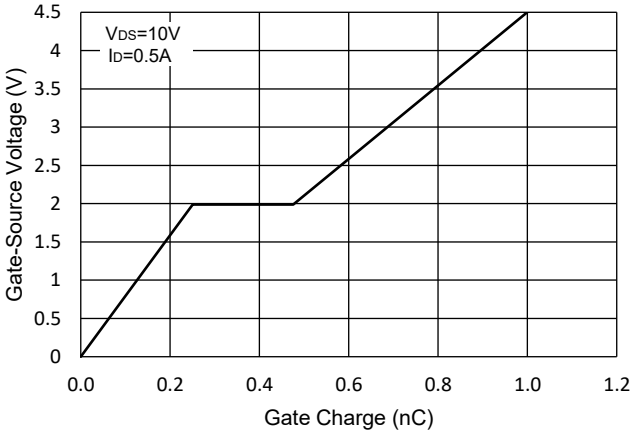


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

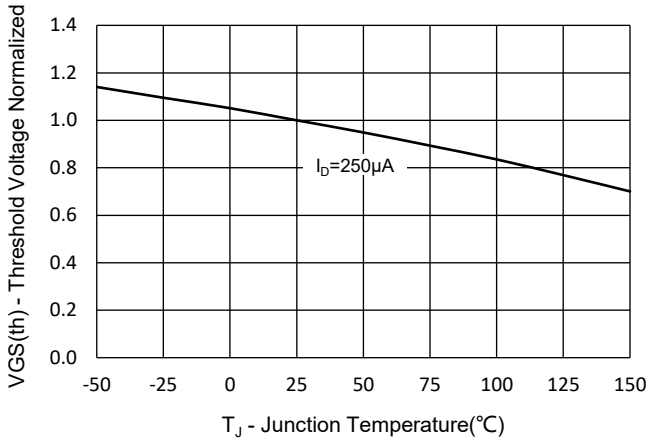


Fig.8 - Normalized On Resistance Characteristics

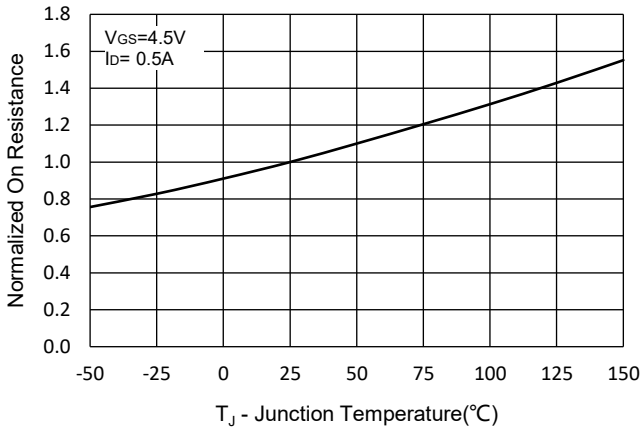


Fig.9 - I_S - V_{SD}

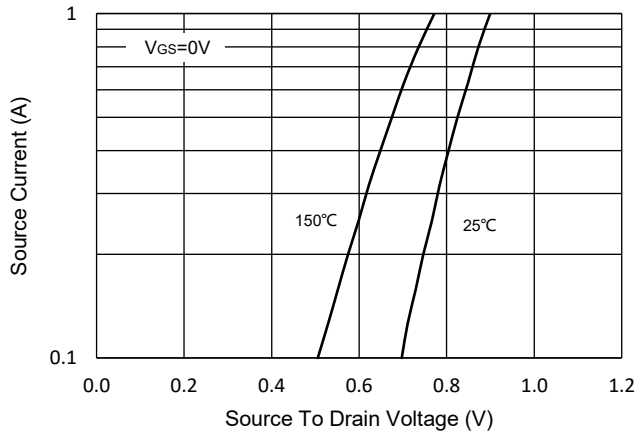


Fig. 10 - Drain Current

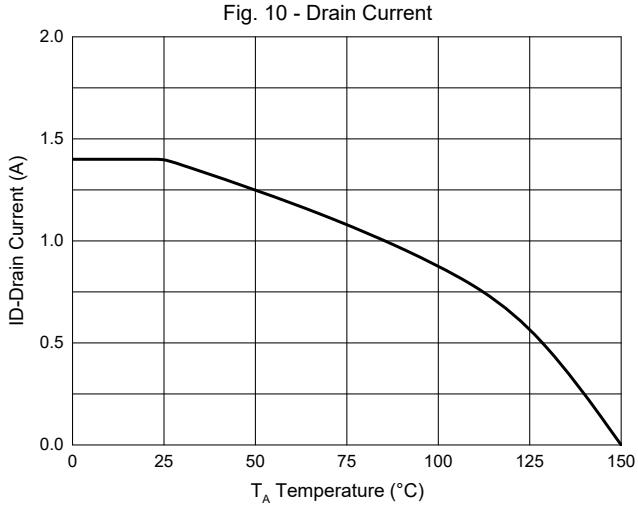
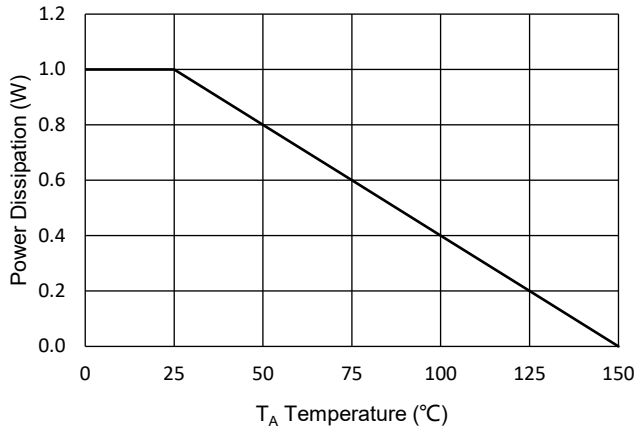


Fig.11 - PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

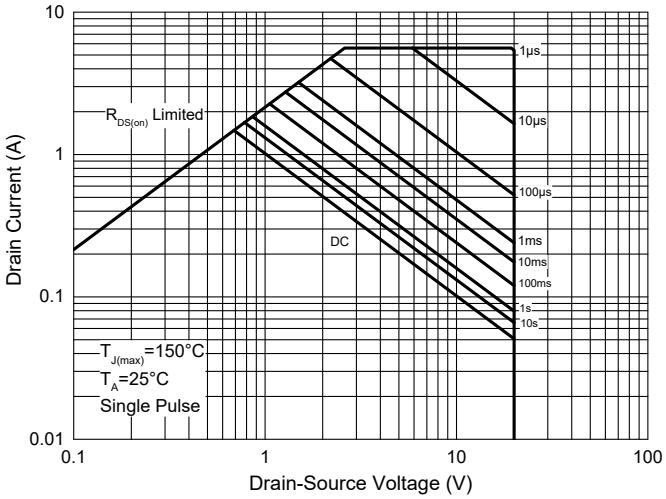
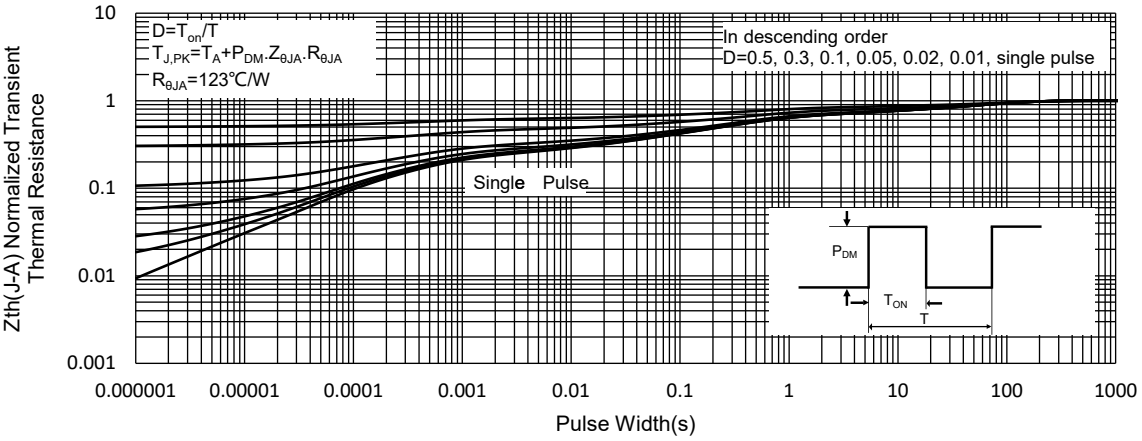


Fig.13 - Normalized Transient Thermal Impedance



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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