

Features

- ESD Protected Up To 2KV (HBM)
- Trench LV MOSFET Technology
- 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

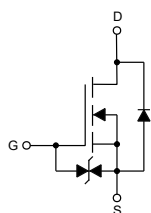
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 190°C/W Junction to Ambient^(Note2)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	20	V
Gate-Source Voltage		V _{GS}	±12	V
Continuous Drain Current	T _A =25°C	I _D	0.75	A
	T _A =70°C		0.6	
Pulsed Drain Current ^(Note 3)		I _{DM}	3	A
Total Power Dissipation ^(Note 4)		P _D	0.66	W

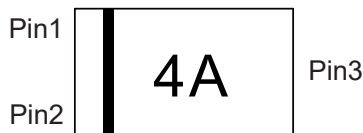
Note:

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 the minimum recommended pad size, 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

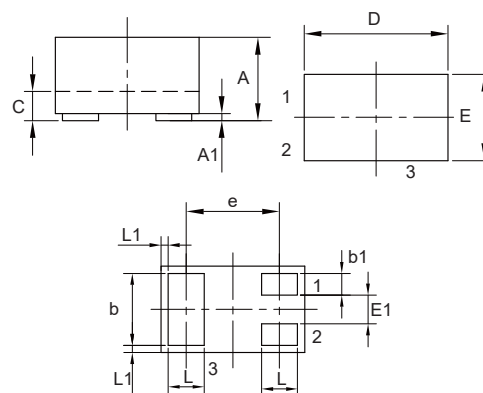


1. GATE
2. SOURCE
3. DRAIN



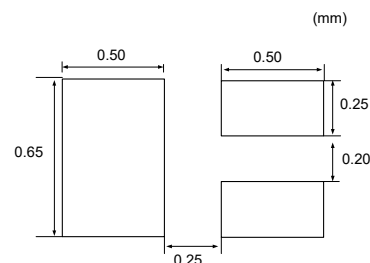
N-Channel MOSFET

DFN1006-3



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.018	0.022	0.45	0.55	
A1	0.000	0.002	0.00	0.05	
b	0.018	0.022	0.45	0.55	
b1	0.004	0.008	0.10	0.20	
c	0.005	0.007	0.12	0.18	
D	0.037	0.042	0.95	1.075	
E	0.022	0.026	0.55	0.675	
E1	0.006	0.010	0.15	0.25	
e	0.026		0.65		TYP.
L	0.008	0.012	0.20	0.30	
L1	0.0002		0.05		TYP.

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	0.35	0.75	1.1	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	350	
		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				750	mA
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}			9.4		
Reverse Transfer Capacitance	C _{rss}			4.6		
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)}			14		
Turn-Off Fall Time	t _f			26		

Curve Characteristics

Fig.1 - Typical Output Characteristics

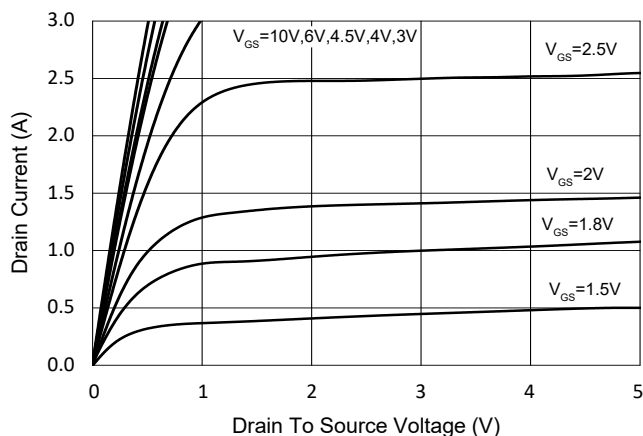


Fig.2 - Transfer Characteristic

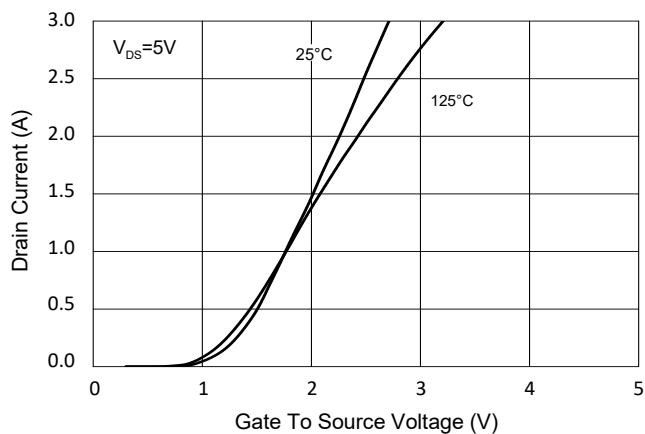


Fig.3 - $R_{DS(ON)} - V_{GS}$

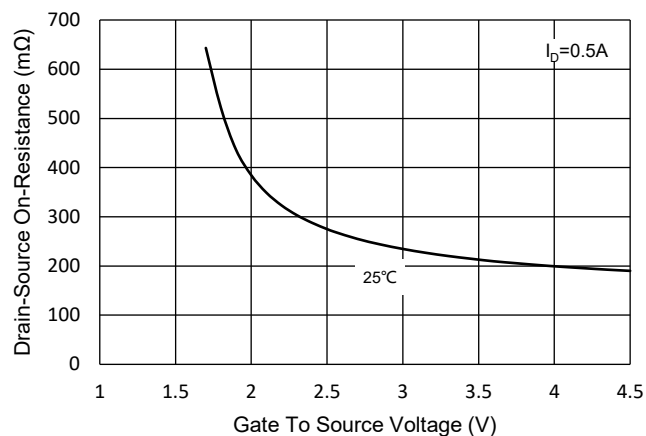


Fig.4 - $R_{DS(ON)} - I_D$

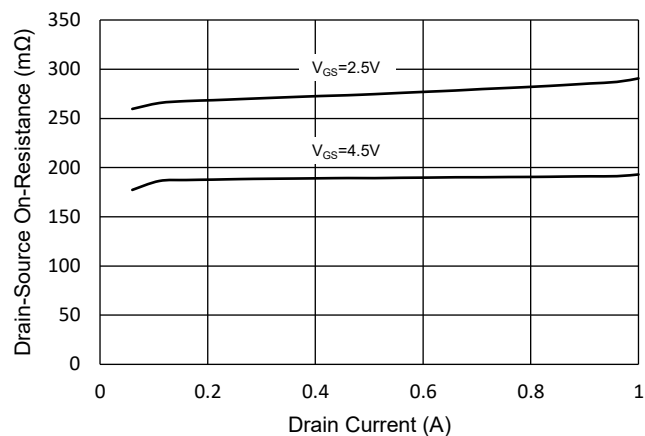


Fig.5 - Capacitance Characteristics

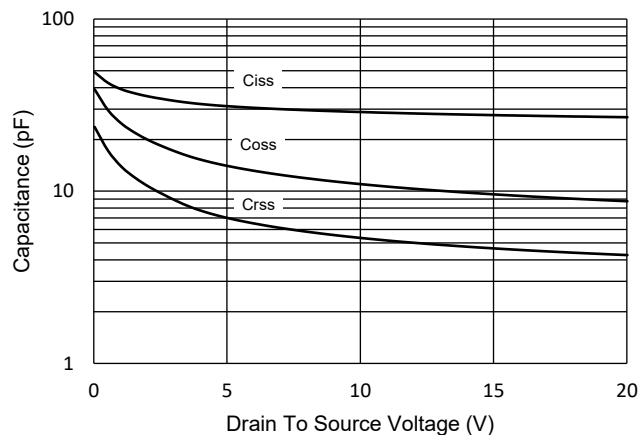
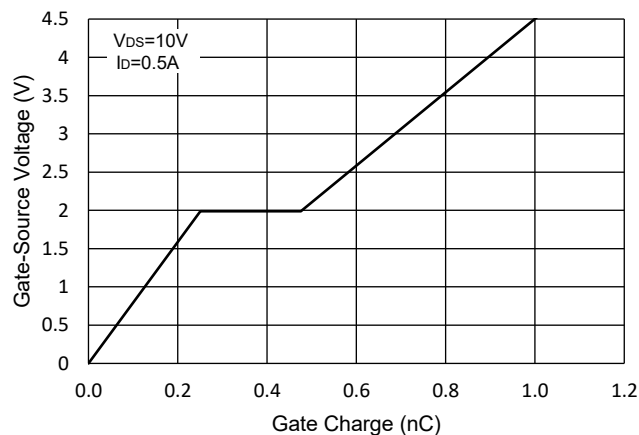


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

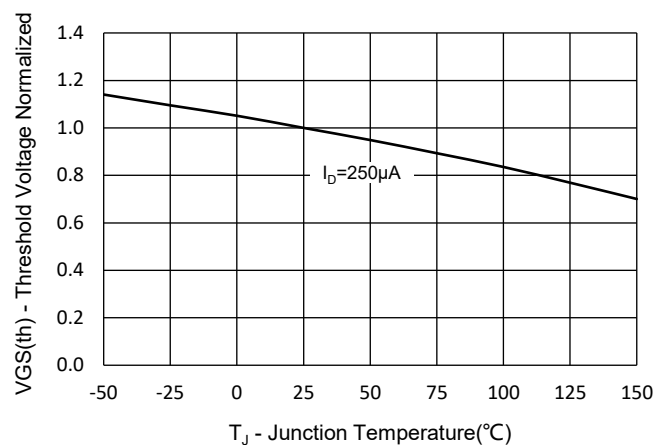


Fig.8 - Normalized On Resistance Characteristics

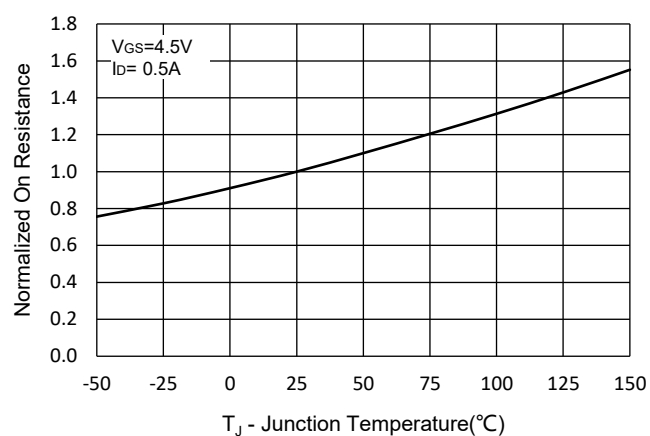


Fig.9 - $I_S - V_{SD}$

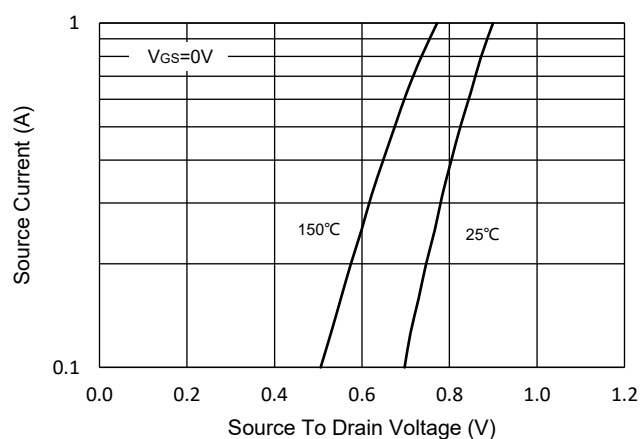


Fig.10 - Drain Current

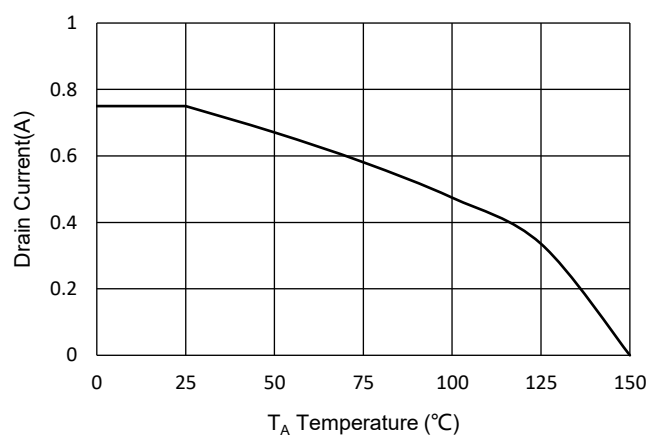
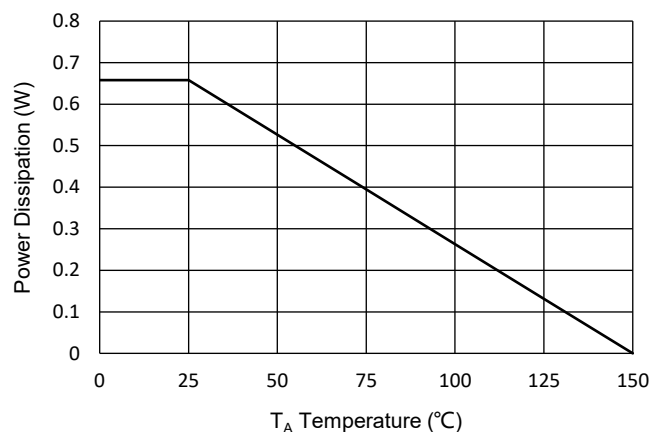


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

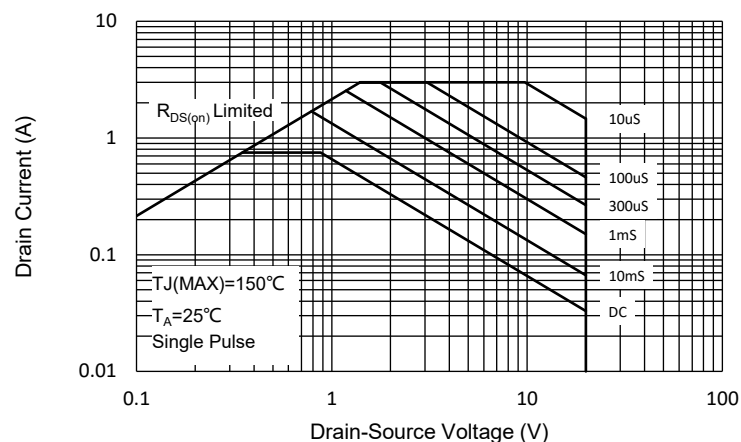
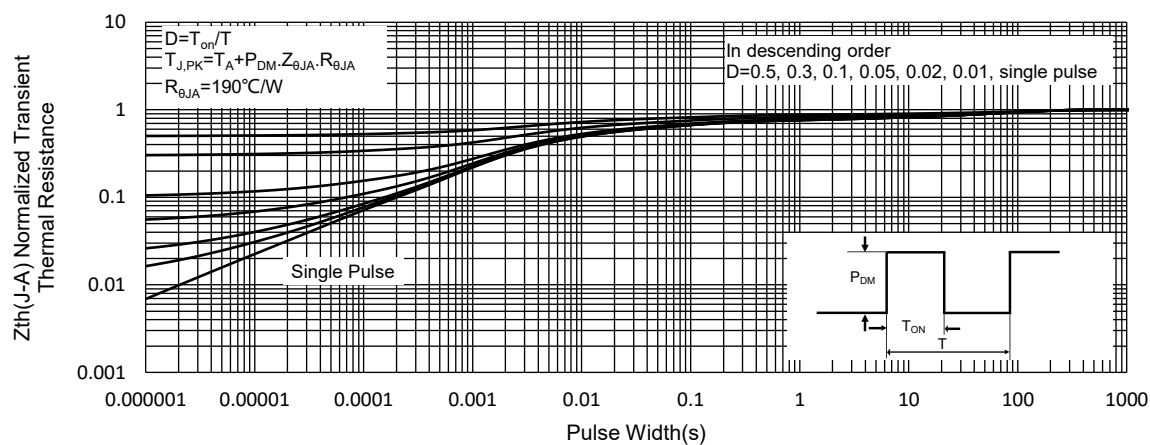


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel:10Kpcs/Reel
Part Number-TPQ3	Tape&Reel:10Kpcs/Reel

For packaging details, go to our website at <https://www.mccsemi.com/pdf/productpackaging/DFN1006-3%20Package.pdf>

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