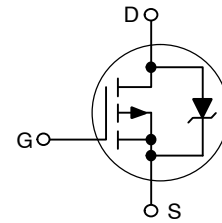


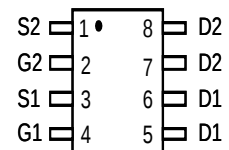
Features

- High Efficiency Components in a Dual SOP-8 Package
- High Density Power MOSFET with Low $R_{DS(on)}$
- Miniature SOP-8 Surface Mount Package – Saves Board Space
- Diode Exhibits High Speed with Soft Recovery
- I_{DSS} Specified at Elevated Temperature
- Avalanche Energy Specified



Applications

- DC-DC Converters
- Low Voltage Motor Control
- Power Management in Portable and Battery-Powered Products, i.e.: Computers, Printers, PCMCIA Cards, Cellular & Cordless Telephones
- $V_{DS(V)} = -30V$
- $R_{DS(ON)} < 85m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 125m\Omega$ ($V_{GS} = -4.5V$)



MAXIMUM RATINGS ($T_J = 25^\circ C$ unless otherwise noted)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	-30	V
Gate-to-Source Voltage – Continuous	V_{GS}	± 20	V
Thermal Resistance –			
Junction-to-Ambient (Note 1)	$R_{\theta JA}$	171	$^\circ C/W$
Total Power Dissipation @ $T_A = 25^\circ C$	P_D	0.73	W
Continuous Drain Current @ $25^\circ C$	I_D	-2.34	A
Continuous Drain Current @ $70^\circ C$	I_D	-1.87	A
Pulsed Drain Current (Note 4)	I_{DM}	-8.0	A
Thermal Resistance –			
Junction-to-Ambient (Note 2)	$R_{\theta JA}$	100	$^\circ C/W$
Total Power Dissipation @ $T_A = 25^\circ C$	P_D	1.25	W
Continuous Drain Current @ $25^\circ C$	I_D	-3.05	A
Continuous Drain Current @ $70^\circ C$	I_D	-2.44	A
Pulsed Drain Current (Note 4)	I_{DM}	-12	A
Thermal Resistance –			
Junction-to-Ambient (Note 3)	$R_{\theta JA}$	62.5	$^\circ C/W$
Total Power Dissipation @ $T_A = 25^\circ C$	P_D	2.0	W
Continuous Drain Current @ $25^\circ C$	I_D	-3.86	A
Continuous Drain Current @ $70^\circ C$	I_D	-3.1	A
Pulsed Drain Current (Note 4)	I_{DM}	-15	A
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ C$
Single Pulse Drain-to-Source Avalanche Energy – Starting $T_J = 25^\circ C$ ($V_{DD} = -30$ Vdc, $V_{GS} = -4.5$ Vdc, Peak $I_L = -7.5$ Apk, $L = 5$ mH, $R_G = 25 \Omega$)	E_{AS}	140	mJ
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	$^\circ C$

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted) (Note 5)

Characteristic		Symbol	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage (V _{GS} = 0 Vdc, I _D = -250 μAdc) Temperature Coefficient (Positive)		V _{(BR)DSS}	-30	-30		Vdc mV/°C
Zero Gate Voltage Drain Current (V _{DS} = -24 Vdc, V _{GS} = 0 Vdc, T _J = 25°C) (V _{DS} = -24 Vdc, V _{GS} = 0 Vdc, T _J = 125°C) (V _{DS} = -30 Vdc, V _{GS} = 0 Vdc, T _J = 25°C)		I _{DSS}			-1.0 -20 -2.0	μAdc
Gate-Body Leakage Current (V _{GS} = -20 Vdc, V _{DS} = 0 Vdc)		I _{GSS}			-100	nAdc
Gate-Body Leakage Current (V _{GS} = +20 Vdc, V _{DS} = 0 Vdc)		I _{GSS}			100	nAdc
Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = -250 μAdc) Temperature Coefficient (Negative)		V _{GS(th)}	-1.0	-1.7 3.6	-2.5	Vdc
Static Drain-to-Source On-State Resistance (V _{GS} = -10 Vdc, I _D = -3.05 Adc) (V _{GS} = -4.5 Vdc, I _D = -1.5 Adc)		R _{DS(on)}		0.063 0.090	0.085 0.125	Ω
Forward Transconductance (V _{DS} = -15 Vdc, I _D = -3.05 Adc)		g _{FS}		5.0		Mhos
Input Capacitance	(V _{DS} = -24 Vdc, V _{GS} = 0 Vdc, f = 1.0 MHz)	C _{iss}		520	750	pF
Output Capacitance		C _{oss}		170	325	
Reverse Transfer Capacitance		C _{rss}		70	135	
Turn-On Delay Time	(V _{DD} = -24 Vdc, I _D = -3.05 Adc, V _{GS} = -10 Vdc, R _G = 6.0 Ω)	t _{d(on)}		12	22	ns
Rise Time		t _r		16	30	
Turn-Off Delay Time		t _{d(off)}		45	80	
Fall Time		t _f		45	80	
Turn-On Delay Time	(V _{DD} = -24 Vdc, I _D = -1.5 Adc, V _{GS} = -4.5 Vdc, R _G = 6.0 Ω)	t _{d(on)}		16		ns
Rise Time		t _r		42		
Turn-Off Delay Time		t _{d(off)}		32		
Fall Time		t _f		35		
Total Gate Charge	(V _{DS} = -24 Vdc, V _{GS} = -10 Vdc, I _D = -3.05 Adc)	Q _{tot}		16	25	nC
Gate-Source Charge		Q _{gs}		2.0		
Gate-Drain Charge		Q _{gd}		4.5		
Diode Forward On-Voltage	(I _S = -3.05 Adc, V _{GS} = 0 V) (I _S = -3.05 Adc, V _{GS} = 0 V, T _J = 125°C)	V _{SD}		-0.96 -0.78	-1.25	Vdc
Reverse Recovery Time	(I _S = -3.05 Adc, V _{GS} = 0 Vdc, dI _S /dt = 100 A/μs)	t _{rr}		34		ns
		t _a		18		
		t _b		16		
Reverse Recovery Stored Charge		Q _{RR}		0.03		μC

- Handling precautions to protect against electrostatic discharge is mandatory.
- Indicates Pulse Test: Pulse Width = 300 μs max, Duty Cycle = 2%.
- Switching characteristics are independent of operating junction temperature.

TYPICAL ELECTRICAL CHARACTERISTICS

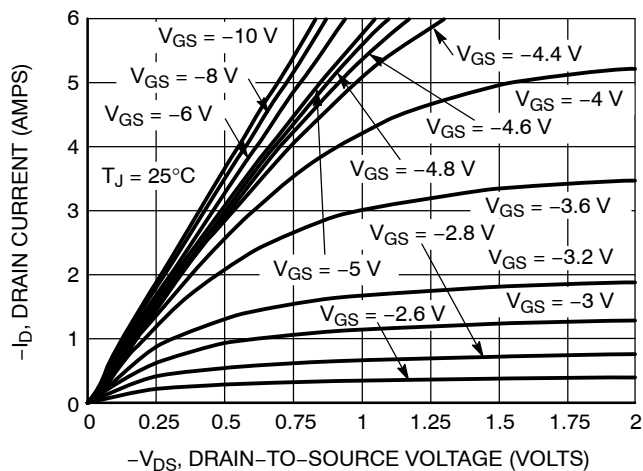


Figure 1. On-Region Characteristics

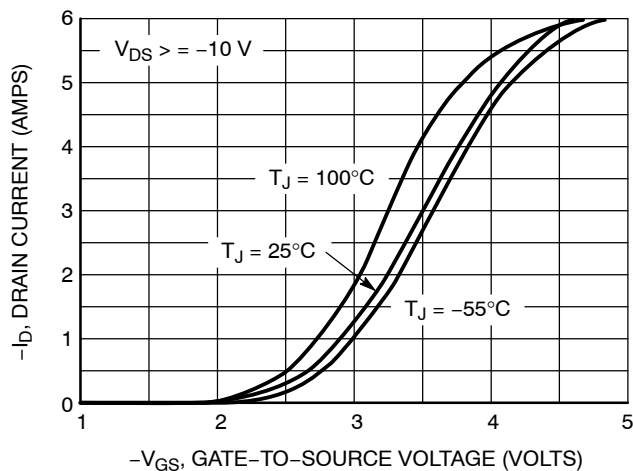


Figure 2. Transfer Characteristics

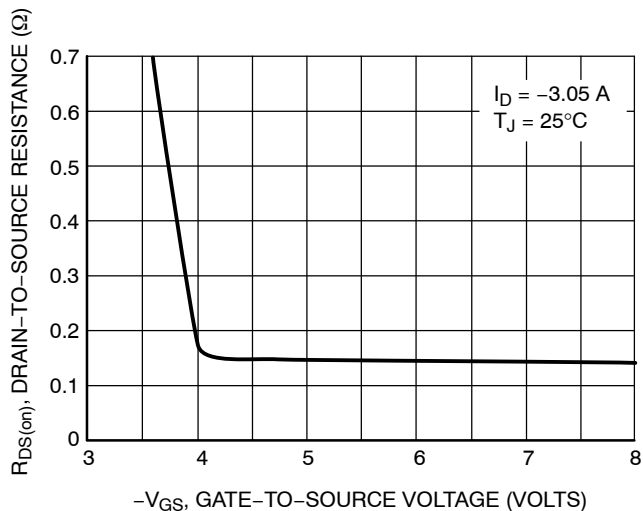


Figure 3. On-Resistance vs. Gate-to-Source Voltage

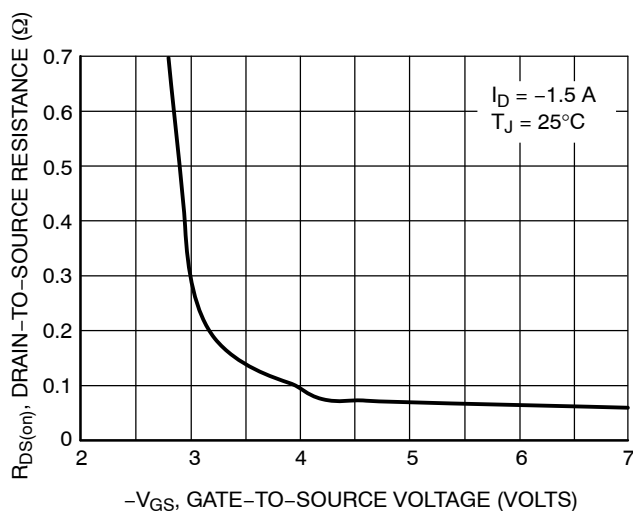


Figure 4. On-Resistance vs. Gate-to-Source Voltage

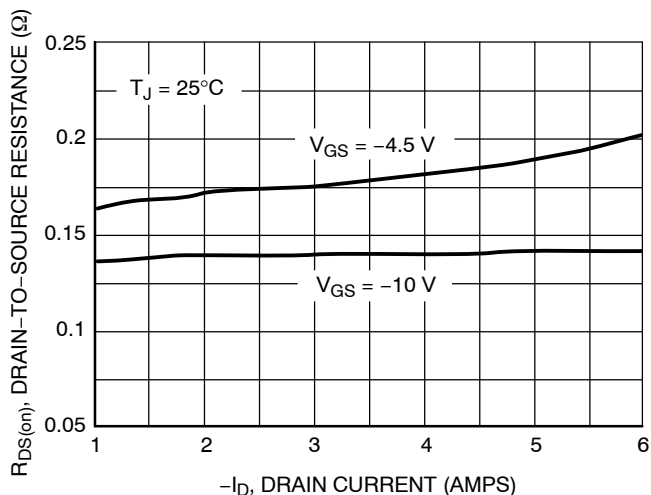


Figure 5. On-Resistance vs. Drain Current and Gate Voltage

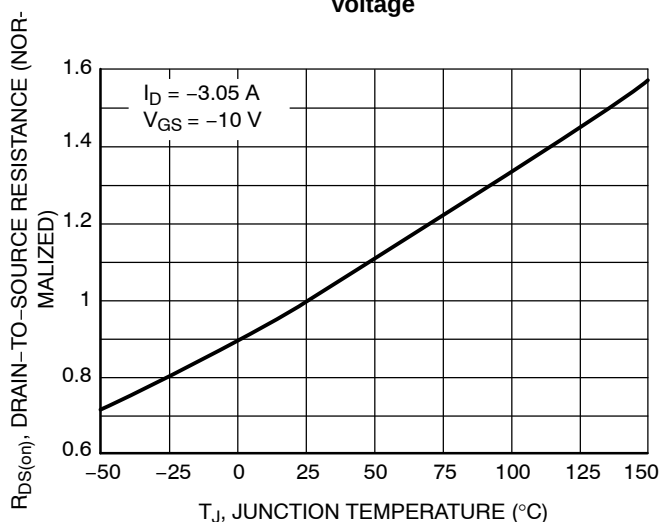


Figure 6. On Resistance Variation with Temperature

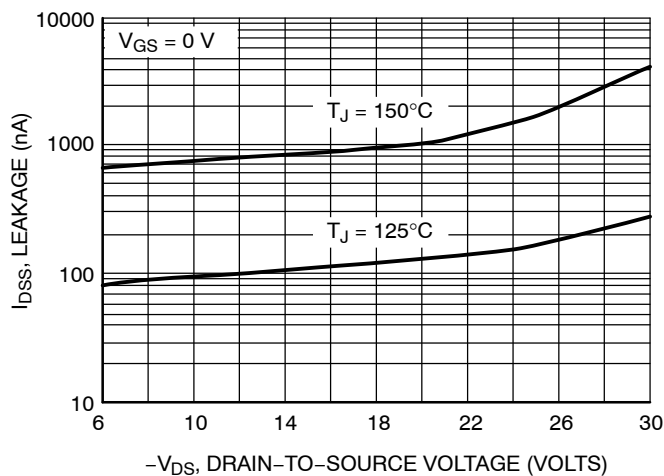


Figure 7. Drain-to-Source Leakage Current vs. Voltage

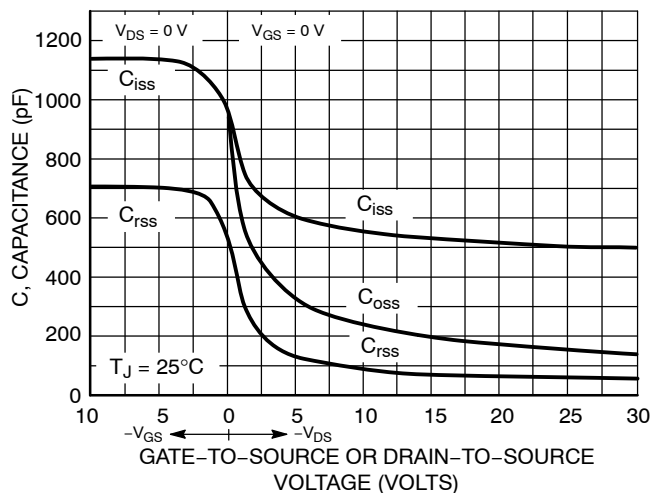


Figure 8. Capacitance Variation

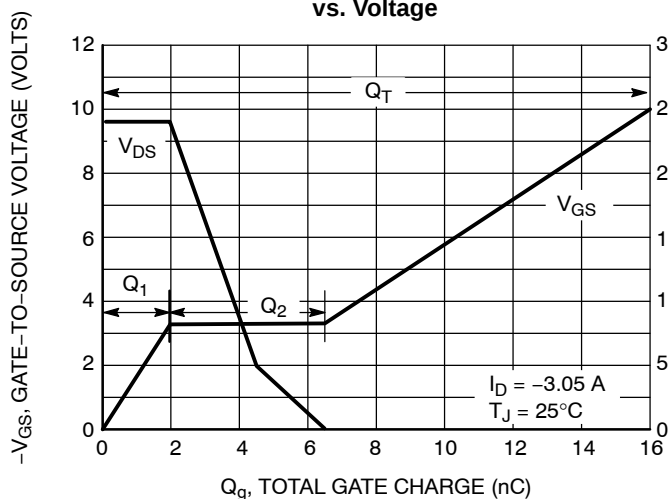


Figure 9. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

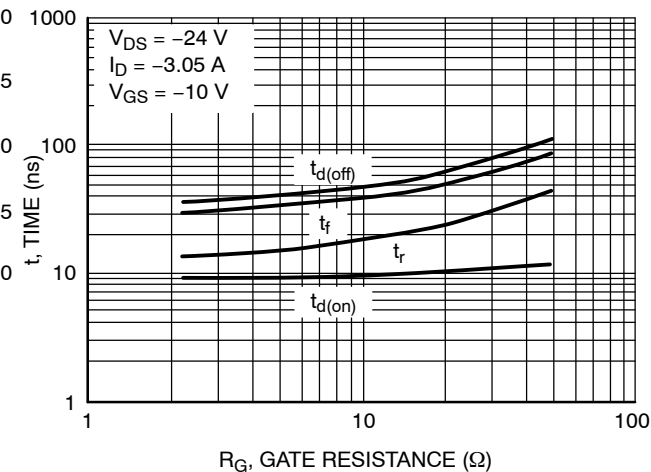


Figure 10. Resistive Switching Time Variation vs. Gate Resistance

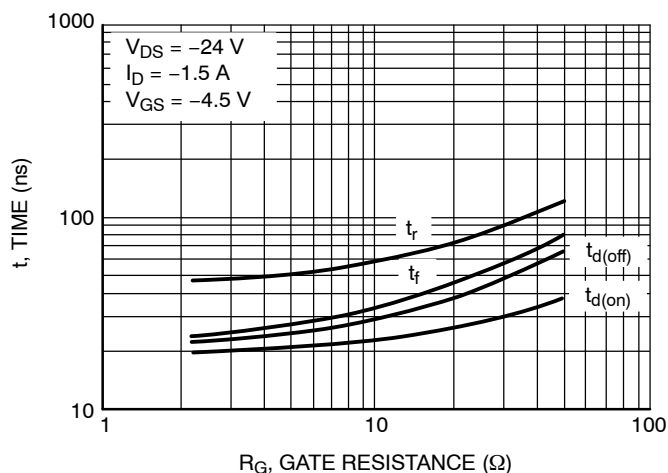


Figure 11. Resistive Switching Time Variation vs. Gate Resistance

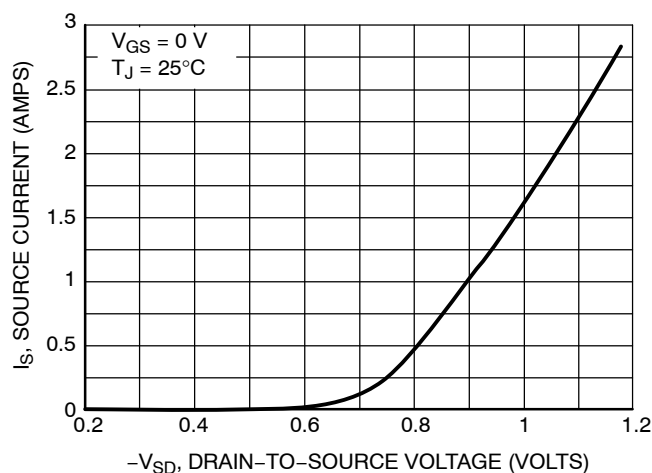


Figure 12. Diode Forward Voltage vs. Current

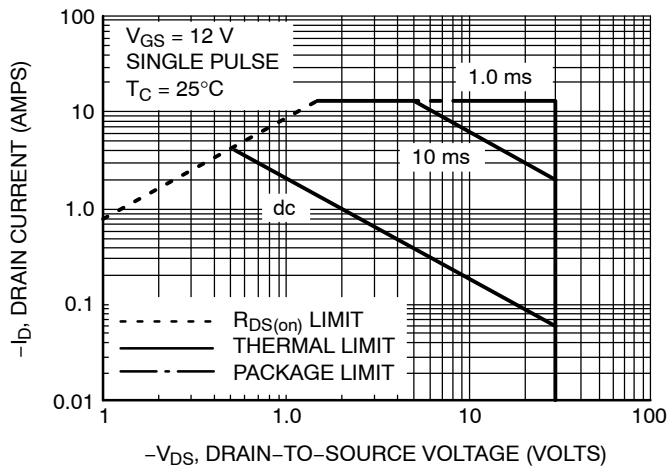


Figure 13. Maximum Rated Forward Biased Safe Operating Area

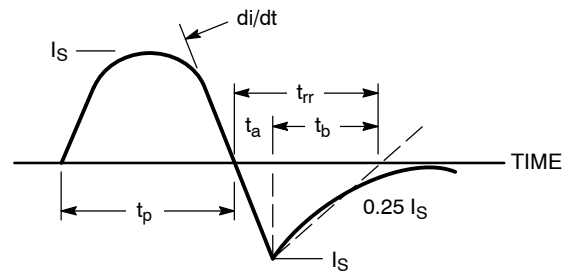


Figure 14. Diode Reverse Recovery Waveform

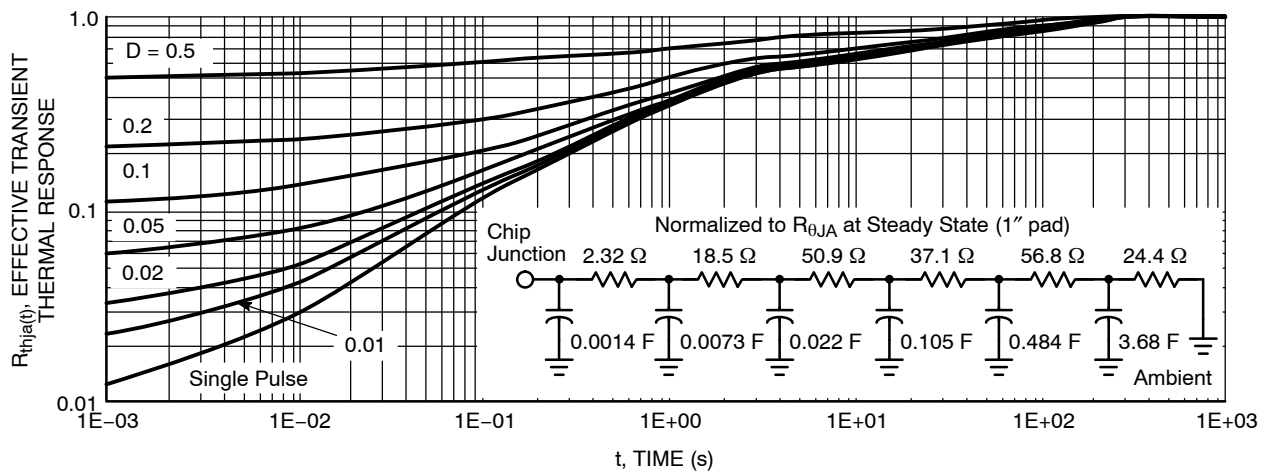
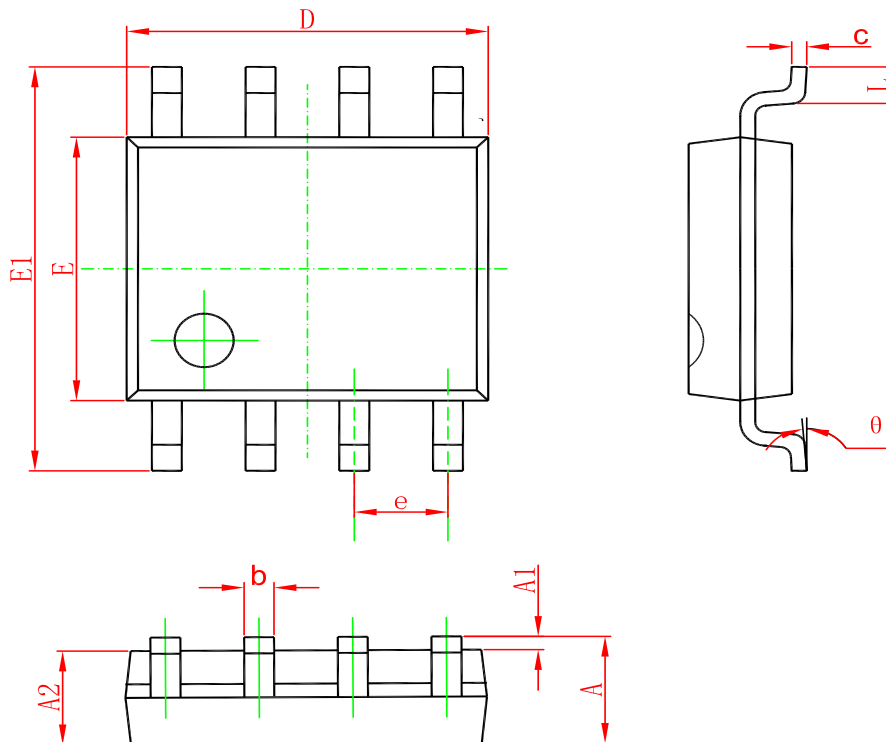


Figure 15. FET Thermal Response

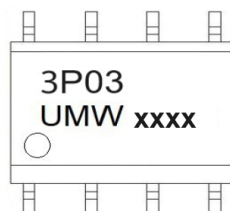
PACKAGE OUTLINE DIMENSIONS

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW NTMD3P03R2G	SOP-8	3000	Tape and reel