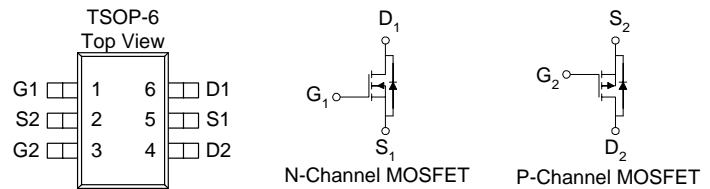


N & P-Channel 32-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.063 @ $V_{GS} = 10V$	3.7
	0.090 @ $V_{GS} = 4.5V$	3.1
-30	0.112 @ $V_{GS} = -10V$	-2.7
	0.172 @ $V_{GS} = -4.5V$	-2.2

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe TSOP-6 saves board space
- Fast switching speed
- High performance trench technology



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)					
Parameter	Symbol	N-Channel	P-Channel	Units	
Drain-Source Voltage	V_{DS}	30	-30	V	
Gate-Source Voltage	V_{GS}	± 20	± 20		
Continuous Drain Current ^a	I_D	$T_A = 25^\circ C$	3.7	-2.7	A
		$T_A = 70^\circ C$	2.9	-2.1	
Pulsed Drain Current ^b	I_{DM}	8	-8		
Continuous Source Current (Diode Conduction) ^a	I_S	1.05	-1.05	A	
Power Dissipation ^a	P_D	$T_A = 25^\circ C$	1.15		W
		$T_A = 70^\circ C$	0.7		
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ C$	

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	N-Channel		P-Channel		Unit	
		Typ	Max	Typ	Max		
Maximum Junction-to-Ambient ^a	R_{thJA}	t <= 10 sec	93	110	93	110	$^\circ C/W$
		Steady State	130	150	130	150	

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
- b. Pulse width limited by maximum junction temperature

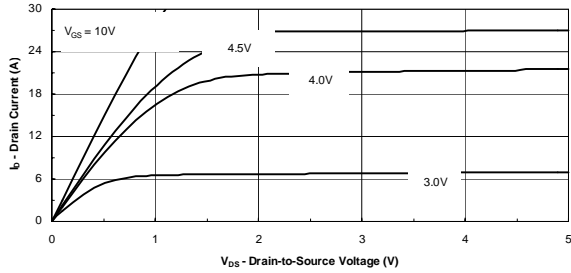
SPECIFICATIONS (T _A = 25°C UNLESS OTHERWISE NOTED)								
Parameter	Symbol	Test Conditions	Limits				Unit	
			Ch	Min	Typ	Max		
Static								
Gate-Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = 250 uA	N	1	1.6	2.5	V	
		V _{GS} = V _{DS} , I _D = -250 uA	P	-1	-1.6	-2.5		
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = 20 V	N		4.5nA	100	uA	
		V _{DS} = 0 V, V _{GS} = -20 V	P		-4.5nA	-100		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V	N		12nA	1	uA	
		V _{DS} = -24 V, V _{GS} = 0 V	P		-12nA	-1		
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 55°C	N				10	uA
		V _{DS} = -24 V, V _{GS} = 0 V, T _J = 55°C	P				-10	
On-State Drain Current ^A	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	N	5			A	
		V _{DS} = -5 V, V _{GS} = -10 V	P	-5				
Drain-Source On-Resistance ^A	r _{DS(on)}	V _{GS} = 10 V, I _D = 3.7 A	N		0.057	0.063	Ω	
		V _{GS} = -10 V, I _D = 3.1 A	P		0.100	0.112		
		V _{GS} = 4.5 V, I _D = 2.7 A	N		0.075	0.090		
		V _{GS} = -4.5 V, I _D = -2.2 A	P		0.148	0.172		
Forward Transconductance ^A	g _{fs}	V _{DS} = 5 V, I _D = 3.7 A	N		10		S	
		V _{DS} = -5 V, I _D = 3.1 A	P		5			
Diode Forward Voltage ^A	V _{SD}	I _S = 1.05 A, V _{GS} = 0 V	N		0.80		S	
		I _S = -1.05 A, V _{GS} = 0 V	P		-0.83			
Dynamic^b								
Total Gate Charge	Q _g	N-Channel V _{DS} =15V, V _{GS} =4.5V, I _D =2.7A P-Channel V _{DS} =-15V, V _{GS} =-4.5V, I _D =-3.1A	N		2.2	5	nC	
Gate-Source Charge	Q _{gs}		P		3.8	8		
			N		0.5	1		
Gate-Drain Charge	Q _{gd}		P		0.6	2		
			N		0.8	2		
Input Capacitance	C _{iss}		N		184	400		
		P		378	800			
Output Capacitance	C _{oss}	N		62	200	pF		
		P		126	300			
Reverse Transfer Capacitance	C _{rss}	N		30	200			
		P		52	300			
Turn-On Delay Time	t _{d(on)}	N-Chaneel V _{DD} =15V, V _{GS} =4.5V, I _D =1A , R _{GEN} =15Ω, P-Channel V _{DD} =-15V, V _{GS} =-4.5V, I _D =-1A R _{GEN} =15Ω	N		5	10	nS	
Rise Time	t _r		P		5	10		
			N		12	30		
Turn-Off Delay Time	t _{d(off)}		P		15	30		
			N		13	30		
Fall-Time	t _f		P		20	40		
			N		7	20		
				P		20		40

Notes

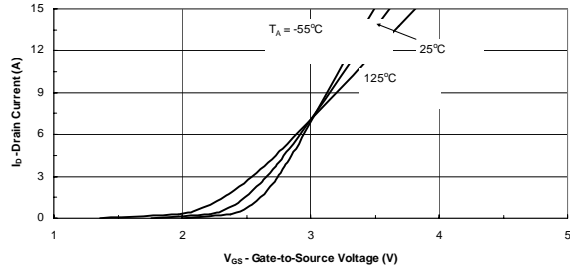
- a. Pulse test: PW <= 300us duty cycle <= 2%.
- b. Guaranteed by design, not subject to production testing.

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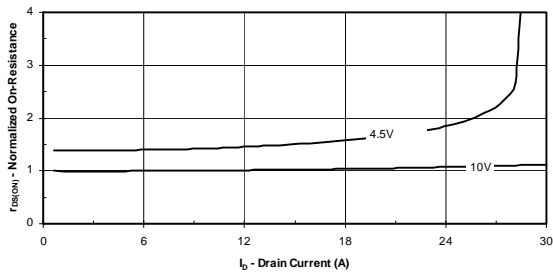
Typical Electrical Characteristics (N-Channel)



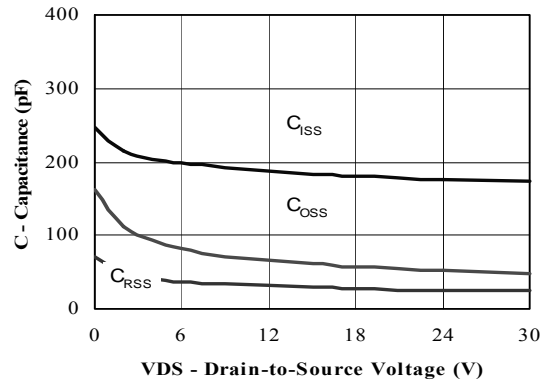
Output Characteristics



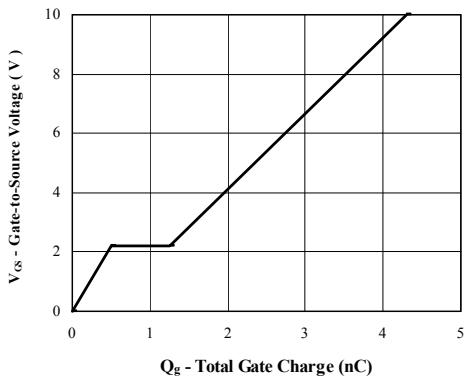
Transfer Characteristics



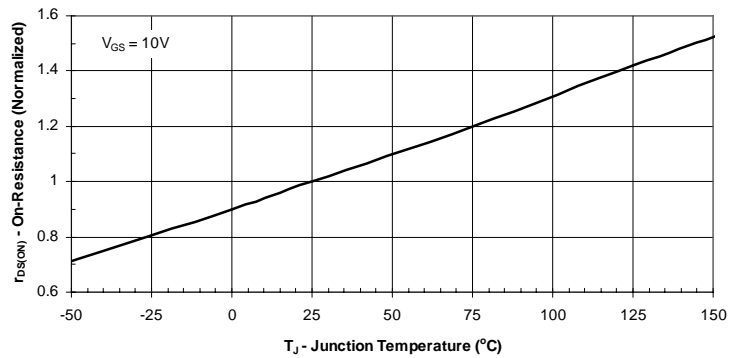
On-Resistance vs. Drain Current



Capacitance

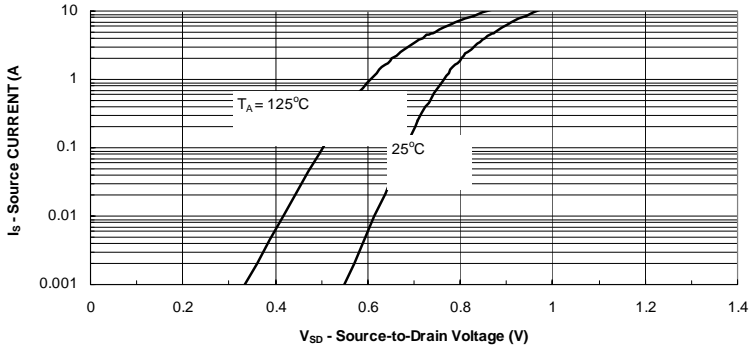


Gate Charge

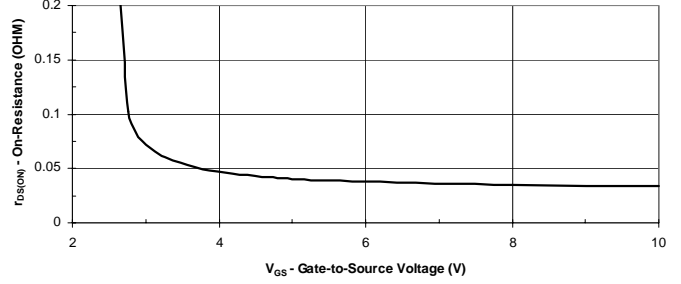
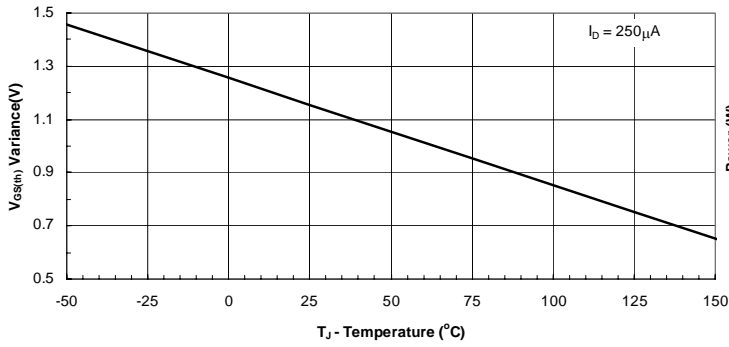


On-Resistance vs. Junction Temperature

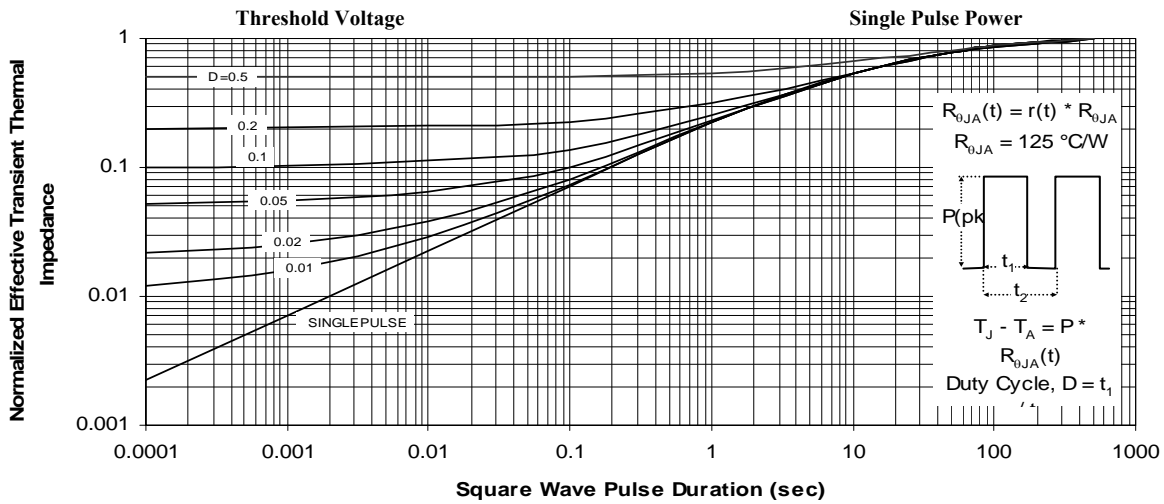
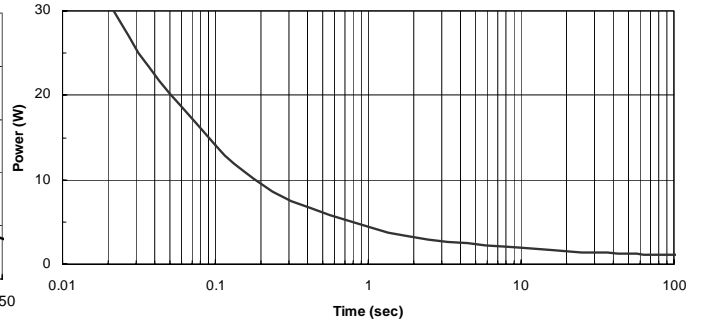
Typical Electrical Characteristics (N-Channel)



Source-Drain Diode Forward Voltage

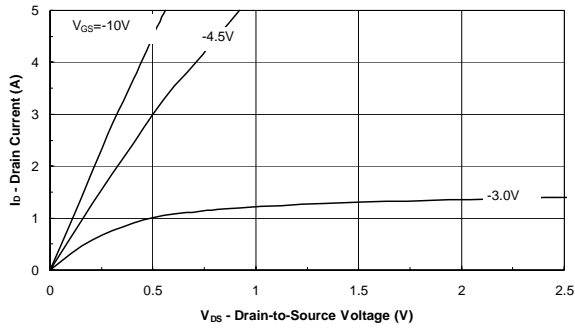


On-Resistance vs. Gate-to Source Voltage

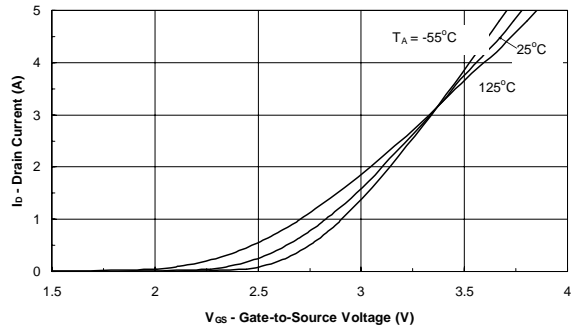


Normalized Thermal Transient Impedance, Junction-to-Ambient

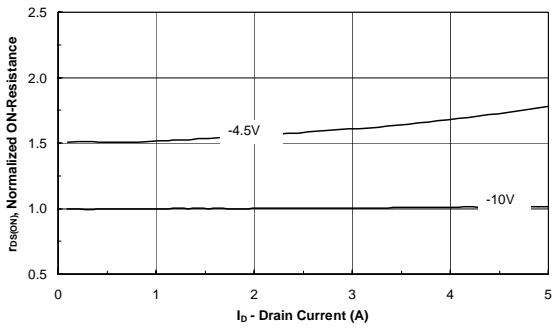
Typical Electrical Characteristics (P-Channel)



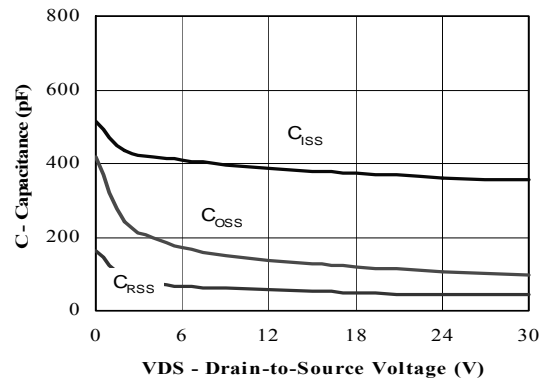
Output Characteristics



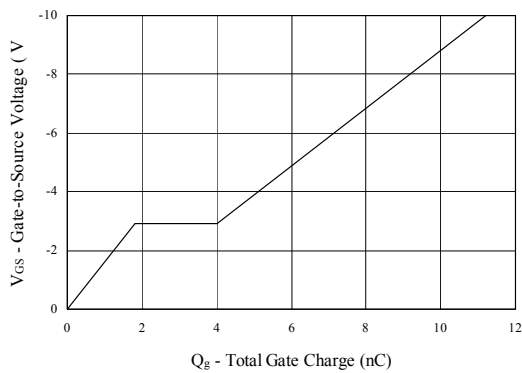
Transfer Characteristics



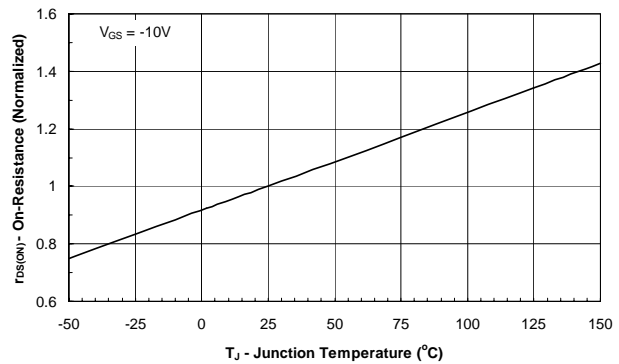
On-Resistance vs. Drain Current



Capacitance

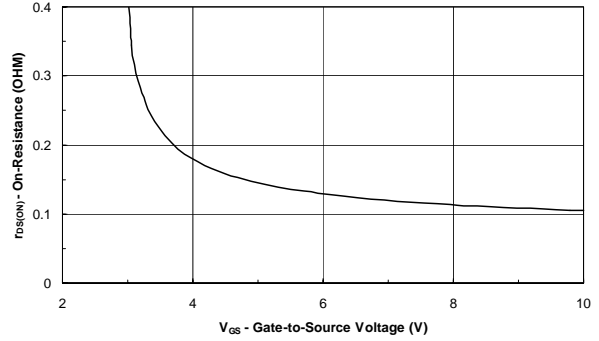
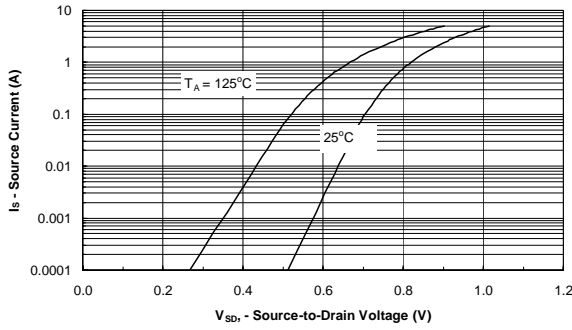


Gate Charge

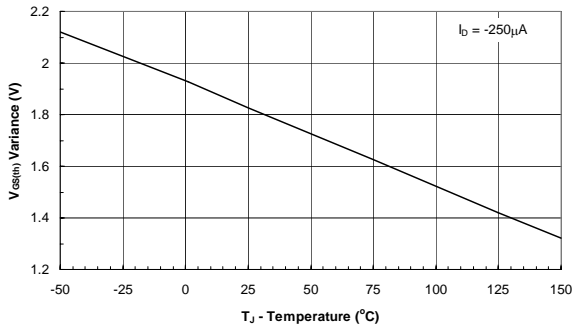


On-Resistance vs. Junction Temperature

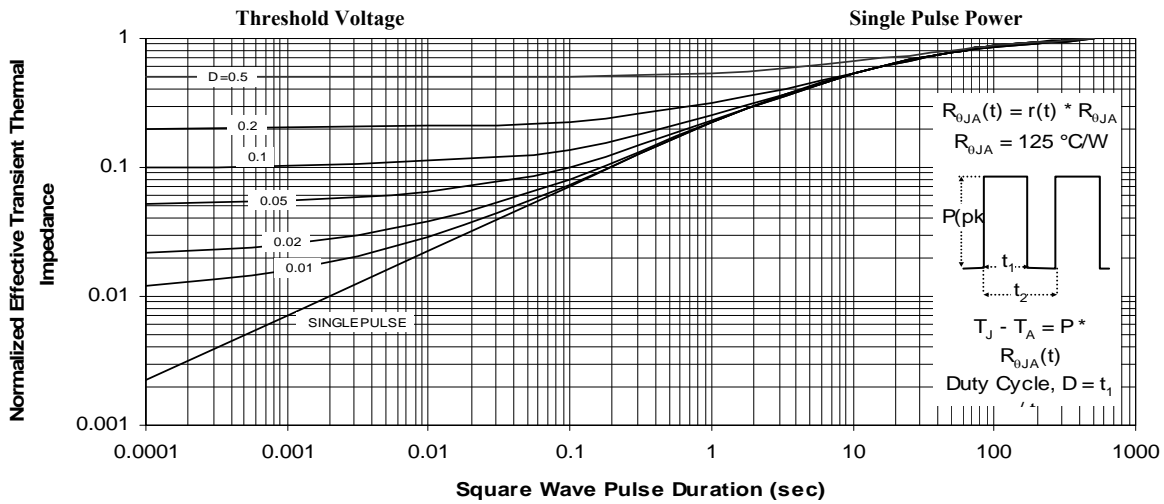
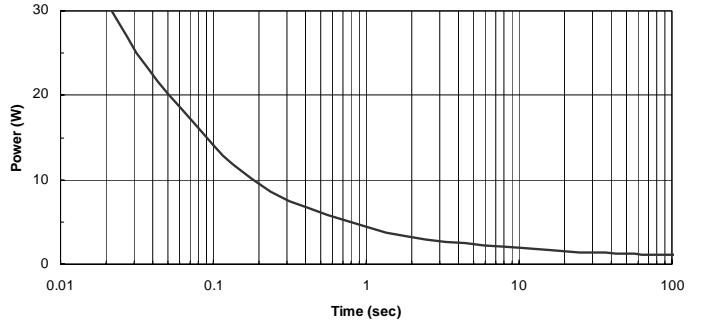
Typical Electrical Characteristics (P-Channel)



Source-Drain Diode Forward Voltage



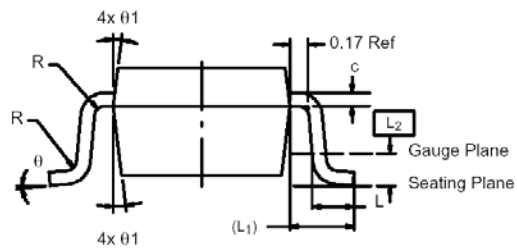
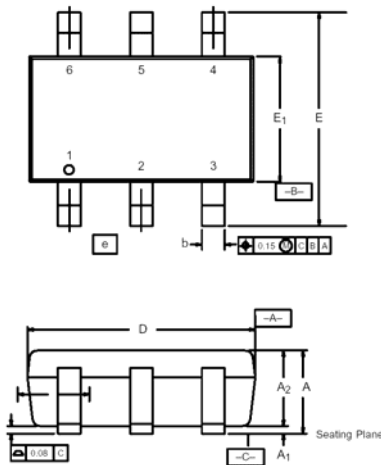
On-Resistance vs. Gate-to Source Voltage



Normalized Thermal Transient Impedance, Junction-to-Ambient

Package Information

TSOP-6: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	–	1.10	0.036	–	0.043
A ₁	0.01	–	0.10	0.0004	–	0.004
A ₂	0.84	–	1.00	0.033	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E ₁	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
L	0.35	–	0.50	0.014	–	0.020
L ₁	0.60 Ref			0.024 Ref		
L ₂	0.25 BSC			0.010 BSC		
R	0.10	–	–	0.004	–	–
θ	0°	4°	8°	0°	4°	8°
θ ₁	7° Nom			7° Nom		