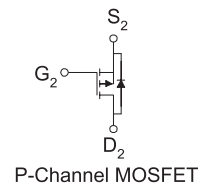
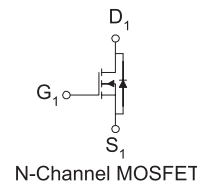
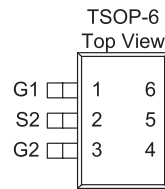


N & P-Channel 32-V (D-S) MOSFET

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.

- 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

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



ABSOLUTE MAXIMUM RATINGS (T _A = 25 °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	T _A =25°C	I _D	3.7	-2.7	A
	T _A =70°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	T _A =25°C	P _D	1.15		W
	T _A =70°C		0.7		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

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

Notes

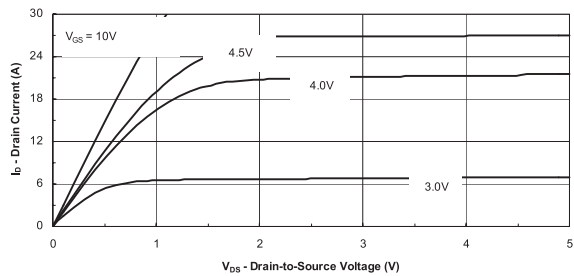
- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

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)}	VGS = VDS, ID = 250 uA	N	1	1.6	2.5	V
		VGS = VDS, ID = -250 uA	P	-1	-1.6	-2.5	
Gate-Body Leakage Current	IGSS	VDS = 0 V, VGS = 20 V	N		4.5nA	100	uA
		VDS = 0 V, VGS = -20 V	P		-4.5nA	-100	
Zero Gate Voltage Drain Current	IDSS	VDS = 24 V, VGS = 0 V	N		12nA	1	uA
		VDS = -24 V, VGS = 0 V	P		-12nA	-1	
		VDS = 24 V, VGS = 0 V, TJ = 55°C	N			10	uA
		VDS = -24 V, VGS = 0 V, TJ = 55°C	P			-10	
On-State Drain Current ^A	ID(on)	VDS = 5 V, VGS = 10 V	N	5			A
		VDS = -5 V, VGS = -10 V	P	-5			
Drain-Source On-Resistance ^A	rDS(on)	VGS = 10 V, ID = 3.7 A	N		0.057	0.063	Ω
		VGS = -10 V, ID = 3.1 A	P		0.100	0.112	
		VGS = 4.5 V, ID = 2.7 A	N		0.075	0.090	
		VGS = -4.5 V, ID = -2.2 A	P		0.148	0.172	
Forward Tranconductance ^A	gfs	VDS = 5 V, ID = 3.7 A	N		10		S
		VDS = -5 V, ID = 3.1 A	P		5		
Diode Forward Voltage ^A	VSD	IS = 1.05 A, VGS = 0 V	N		0.80		S
		IS = -1.05 A, VGS = 0 V	P		-0.83		
Dynamic ^b							
Total Gate Charge	Qg	N-Channel VDS=15V, VGS=4.5V, ID=2.7A P-Channel VDS=-15V, VGS=-4.5V, ID=-3.1A	N		2.2	5	nC
Gate-Source Charge	Qgs		P		3.8	8	
			N		0.5	1	
			P		0.6	2	
			P		1.5	3	
Gate-Drain Charge	Qgd	N		0.8	2	pF	
Input Capacitance	Ciss	P		184	400		
		N		62	200		
		P		126	300		
		P		52	300		
Output Capacitance	Coss	N		5	10	nS	
Reverse Transfer Capacitance	Crss	P		5	10		
		N		12	30		
		P		15	30		
		N		13	30		
Turn-On Delay Time	td(on)	VDD=15V, VGS=4.5V, ID=1A , RGEN=15Ω, P-Channel VDD=-15V, VGS=-4.5V, ID=-1A RGEN=15Ω	P		20	40	nS
Rise Time	tr	N		7	20		
		P		20	40		
		N		7	20		
		P		20	40		
Turn-Off Delay Time	td(off)		N		7	20	nS
Fall-Time	tf	P		20	40		
		N		7	20		
		P		20	40		
		N		7	20		

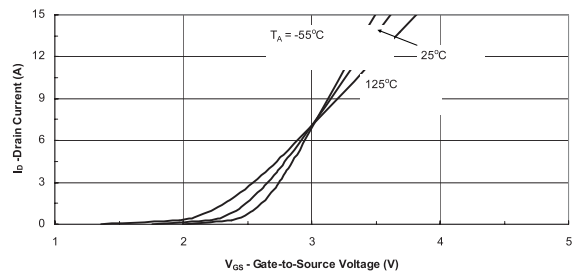
Notes

- Pulse test: PW ≤ 300 μ s duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

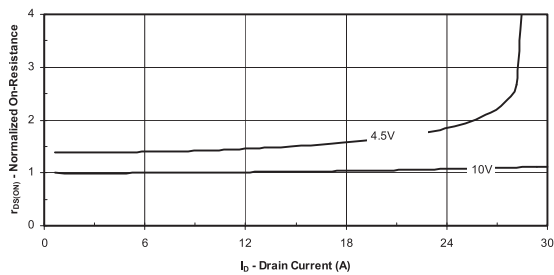
Typical Electrical Characteristics (N-Channel)



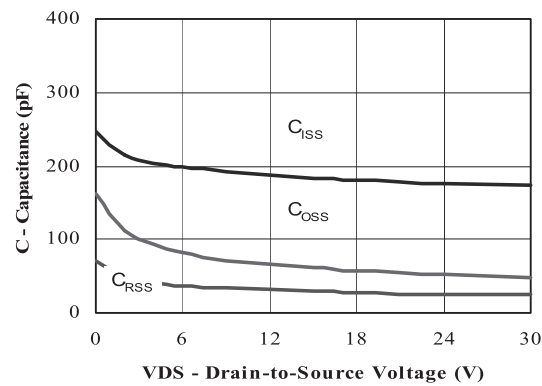
Output Characteristics



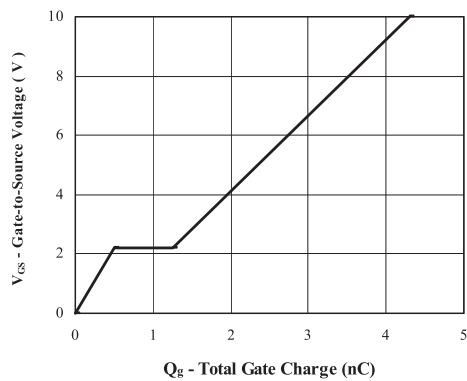
Transfer Characteristics



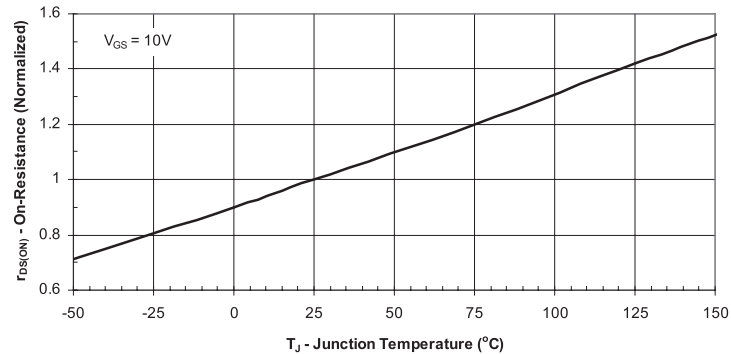
On-Resistance vs. Drain Current



Capacitance

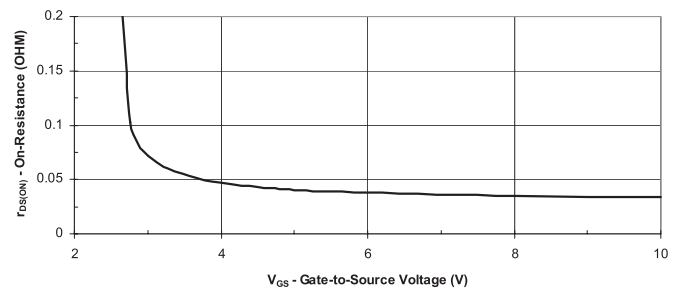
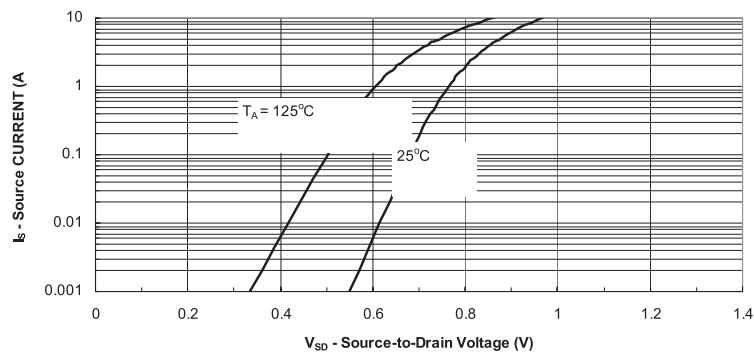


Gate Charge

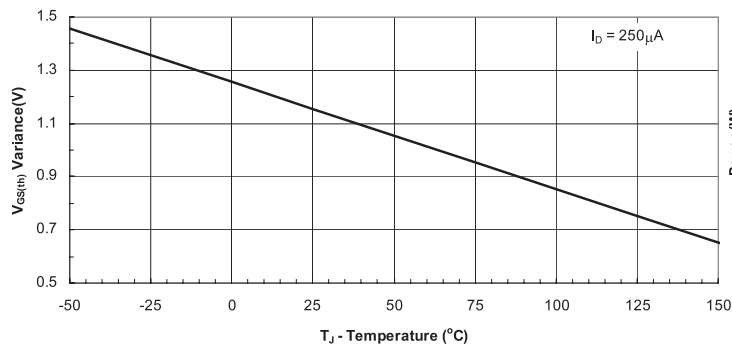


On-Resistance vs. Junction Temperature

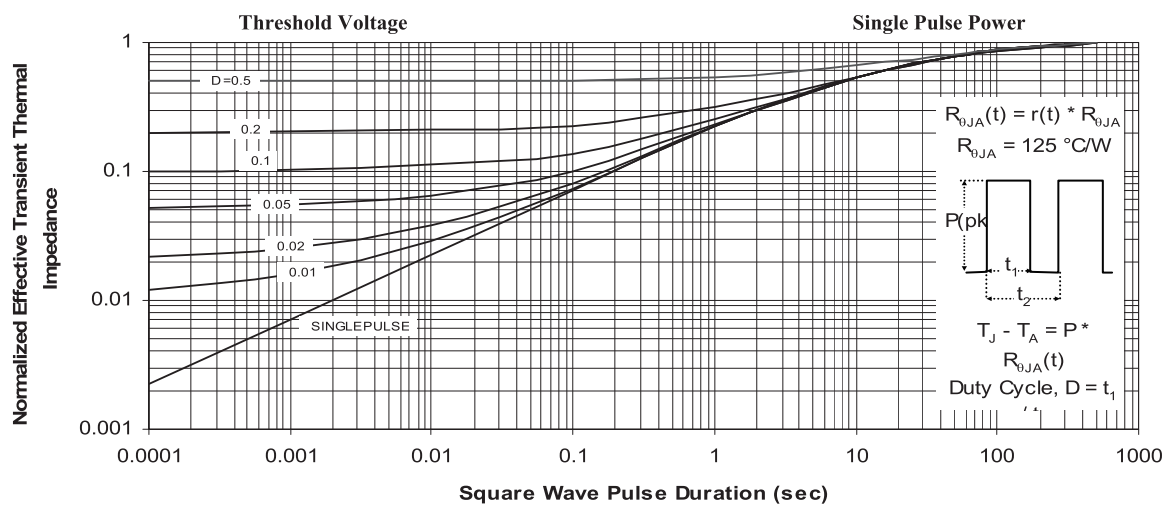
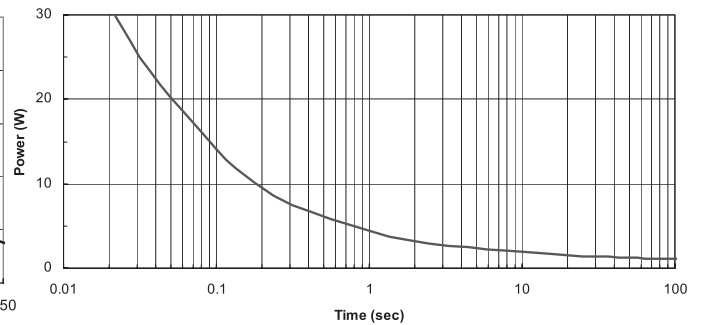
Typical Electrical Characteristics (N-Channel)



Source-Drain Diode Forward Voltage

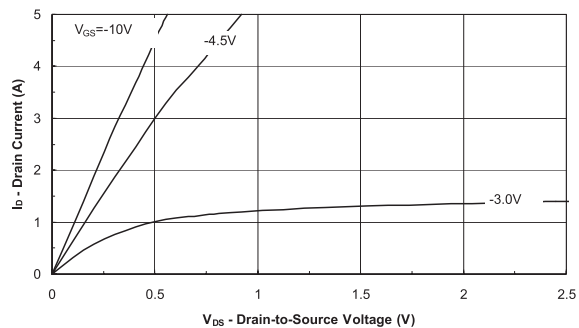


On-Resistance vs. Gate-to Source Voltage

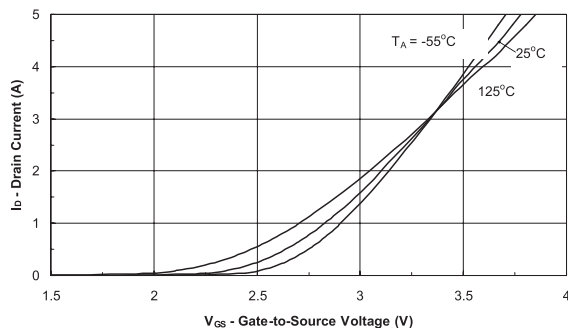


Normalized Thermal Transient Impedance, Junction-to-Ambient

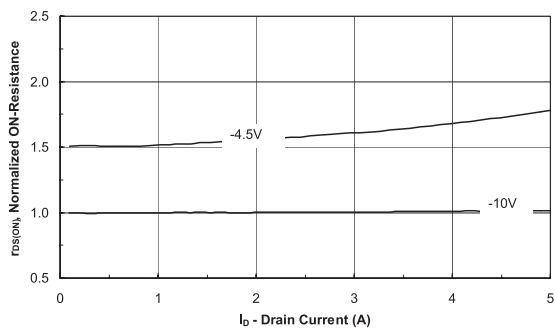
Typical Electrical Characteristics (P-Channel)



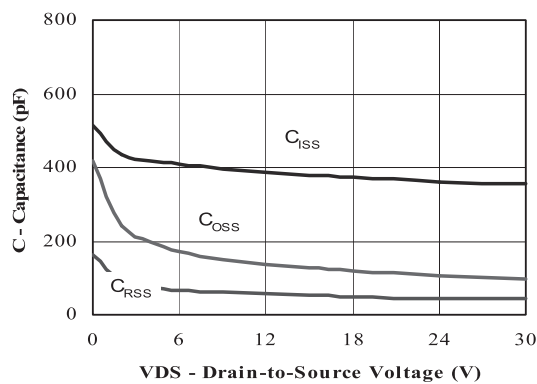
Output Characteristics



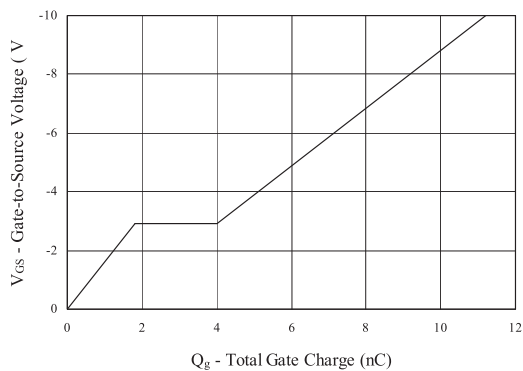
Transfer Characteristics



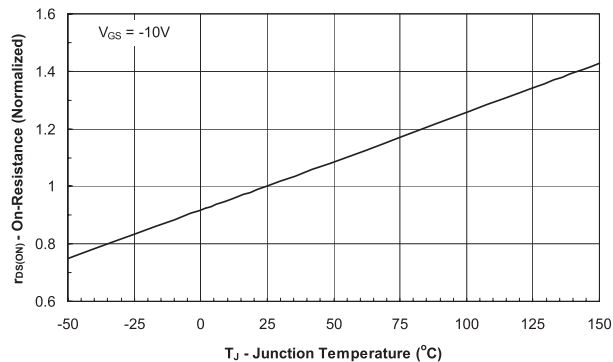
On-Resistance vs. Drain Current



Capacitance

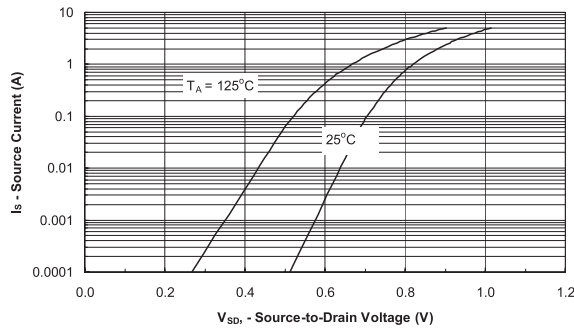


Gate Charge

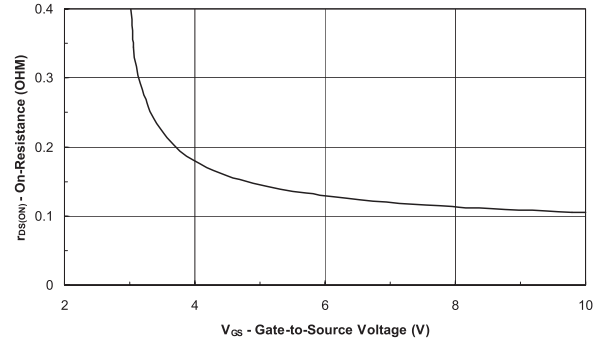


On-Resistance vs. Junction Temperature

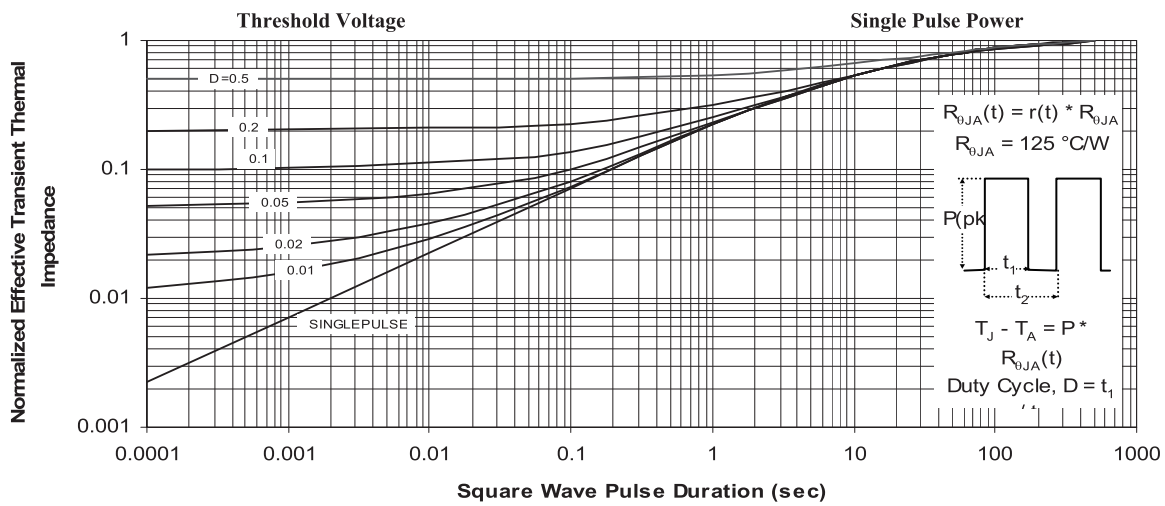
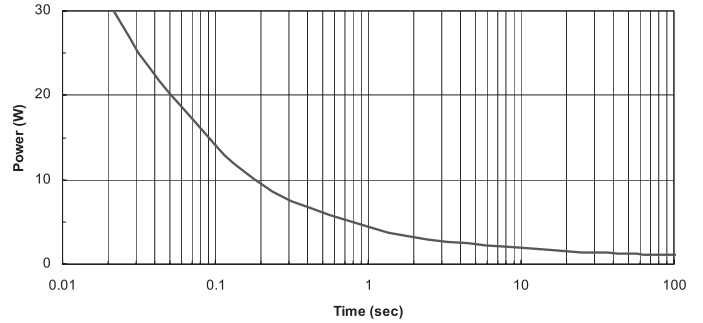
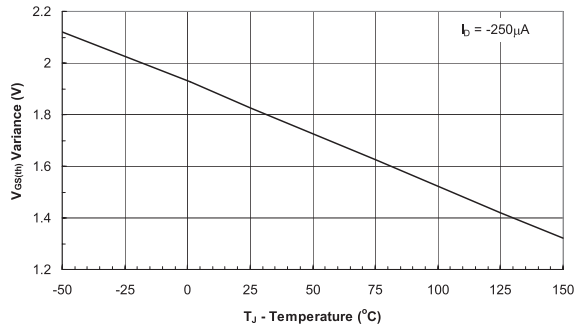
Typical Electrical Characteristics (P-Channel)



Source-Drain Diode Forward Voltage



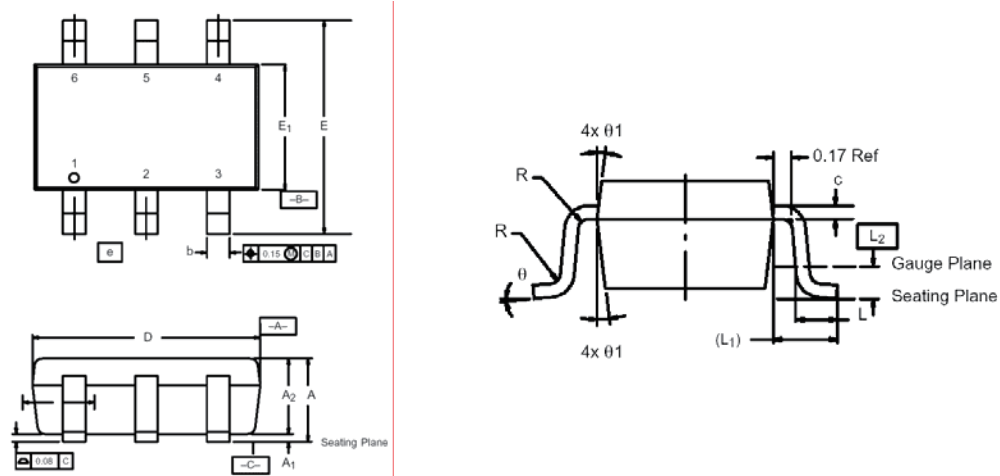
On-Resistance vs. Gate-to-Source Voltage



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		