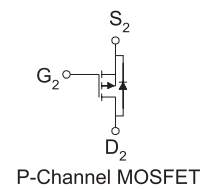
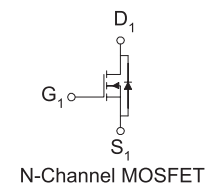
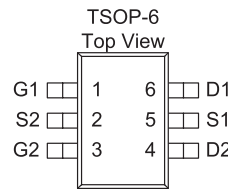


N & P-Channel 30-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize High Cell Density process. Low $r_{DS(on)}$ assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are DC-DC converters, 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
- Miniature TSOP-6 Surface Mount Package Saves Board Space



PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
23	0.058 @ $V_{GS} = 4.5V$	3.7
	0.082 @ $V_{GS} = 2.5V$	3.1
	0.160 @ $V_{GS} = 1.8V$	2.2
-23	0.112 @ $V_{GS} = -4.5V$	-2.7
	0.172 @ $V_{GS} = -2.5V$	-2.2
	0.210 @ $V_{GS} = -1.8V$	-2.0

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage		V _{DS}	23	-23	V
Gate-Source Voltage		V _{GS}	±12	±12	
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 ≤ 10 sec	R _{thJA}	93	110	93	110	°C/W
	Steady State		130	150	130	150	

Notes

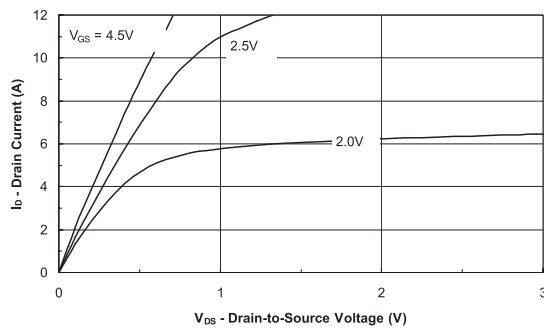
- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

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)}	V _{GS} = V _{DS} , I _D = 250 uA	N	1			V	
		V _{GS} = V _{DS} , I _D = -250 uA	P	-1				
Gate-Body Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = 12 V	N			100	uA	
		V _{DS} = 0 V, V _{GS} = -12 V	P			-100		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16 V, V _{GS} = 0 V	N			1	uA	
		V _{DS} = -16 V, V _{GS} = 0 V	P			-1		
		V _{DS} = 16 V, V _{GS} = 0 V, T _J = 55°C	N			10	uA	
		V _{DS} = -16 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} = 4.5 V	N	5			A	
		V _{DS} = -5 V, V _{GS} = -4.5 V	P	-5				
Drain-Source On-Resistance ^A	r _{DS(on)}	V _{GS} = 4.5 V, I _D = 3.7 A	N			0.058	Ω	
		V _{GS} = -4.5 V, I _D = 3.1 A	P			0.112		
		V _{GS} = 2.5 V, I _D = 2.7 A	N			0.082		
		V _{GS} = -2.5 V, I _D = -2.2 A	P			0.172		
		V _{GS} = 1.8 V, I _D = 2.2 A	N			0.160		
		V _{GS} = -1.8 V, I _D = -2.0 A	P			0.210		
Forward Tranconductance ^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		7.5		nC	
Gate-Source Charge	Q _{gs}		P		3.8			
			N		0.6			
			P		0.6			
Gate-Drain Charge	Q _{gd}	N		1.0		nC		
		P		1.5				
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		nS	
Rise Time	t _r		P		5			
			N		12			
			P		15			
Turn-Off Delay Time	t _{d(off)}		N		13			nS
			P		20			
Fall-Time	t _f		N		7			nS
			P		20			

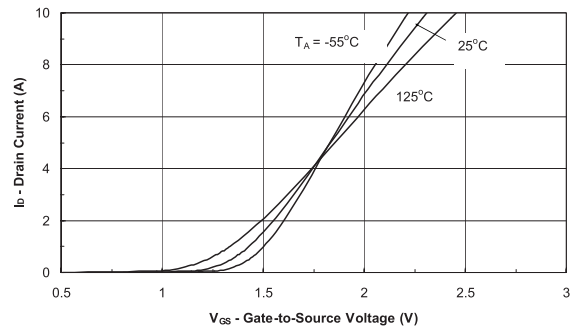
Notes

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

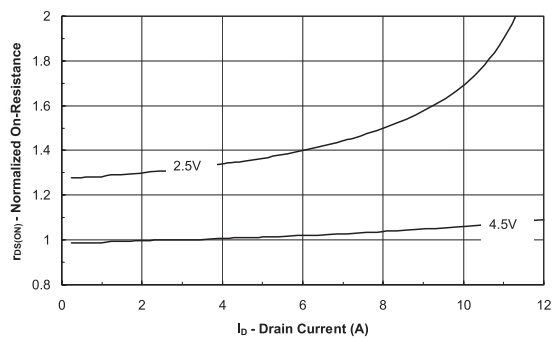
Typical Electrical Characteristics (N-Channel)



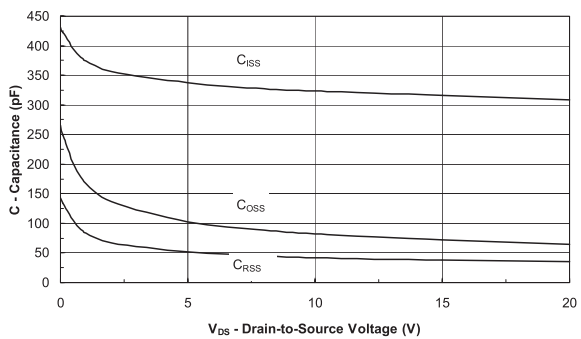
Output Characteristics



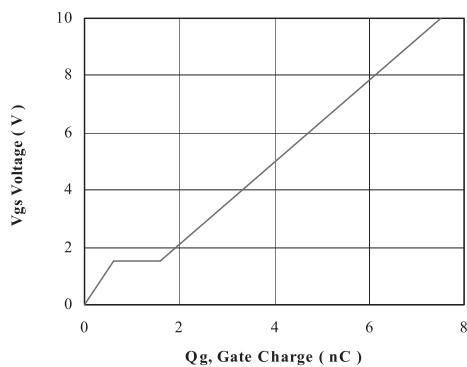
Transfer Characteristics



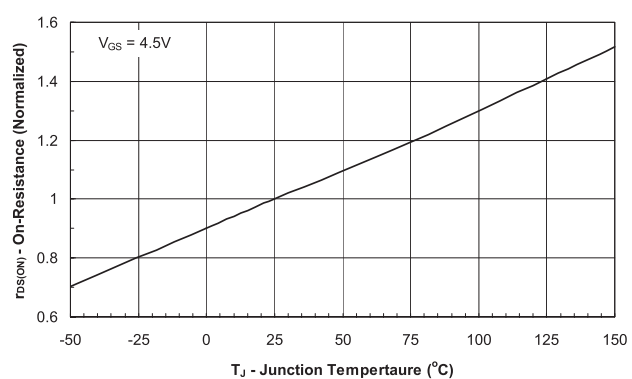
On-Resistance vs. Drain Current



Capacitance

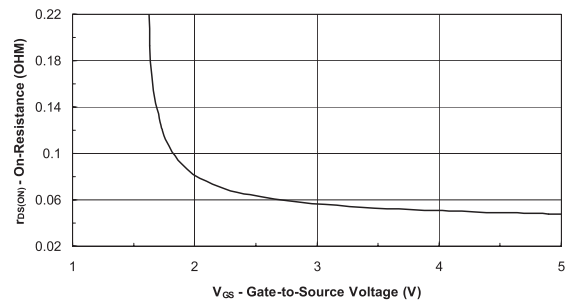
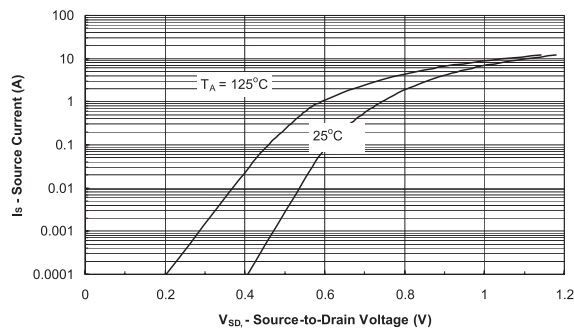


Gate Charge

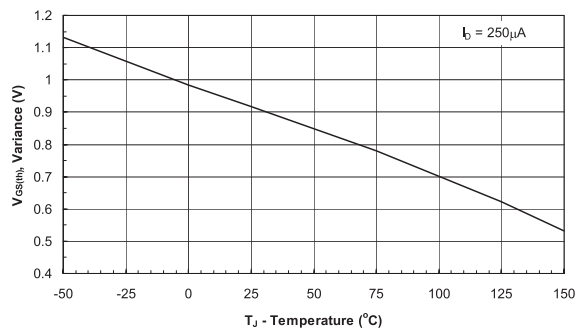


On-Resistance vs. Junction Temperature

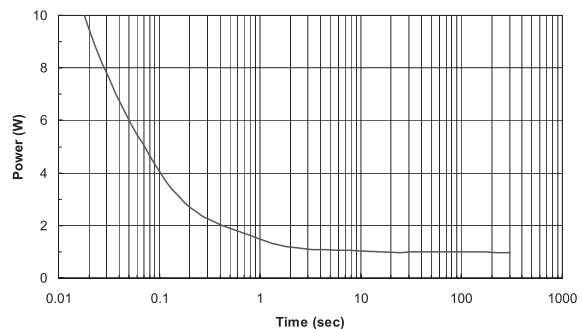
Typical Electrical Characteristics (N-Channel)



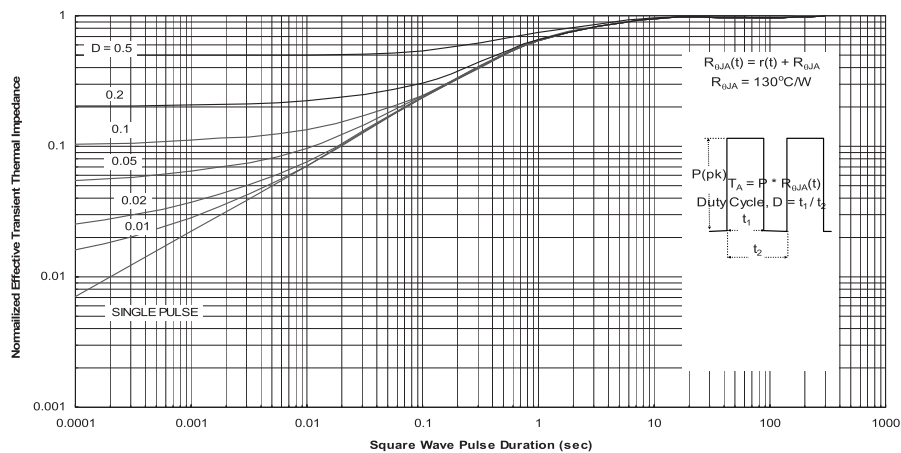
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to Source Voltage



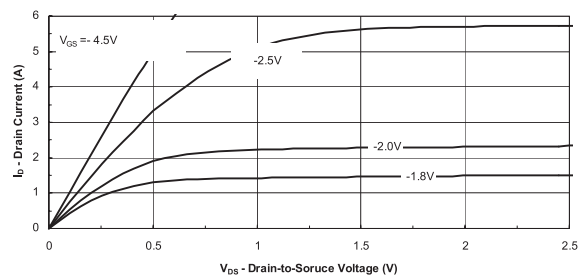
Threshold Voltage



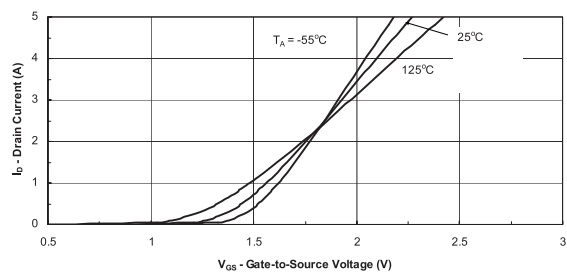
Single Pulse Power

Normalized Thermal Transient Impedance, Junction-to-Ambient

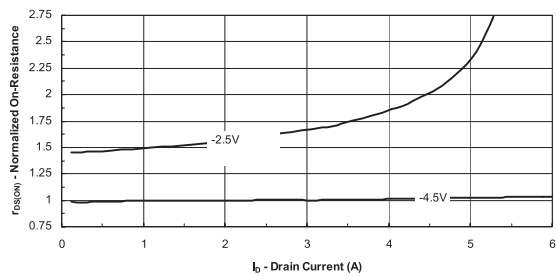
Typical Electrical Characteristics (P-Channel)



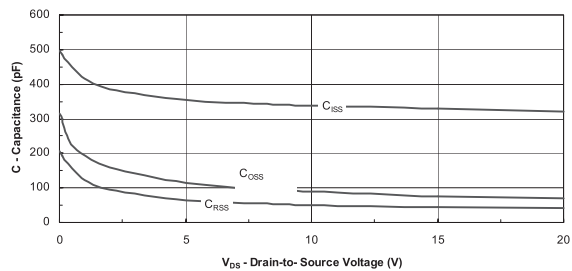
Output Characteristics



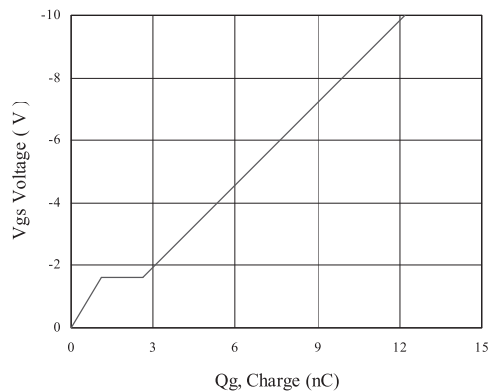
Transfer Characteristics



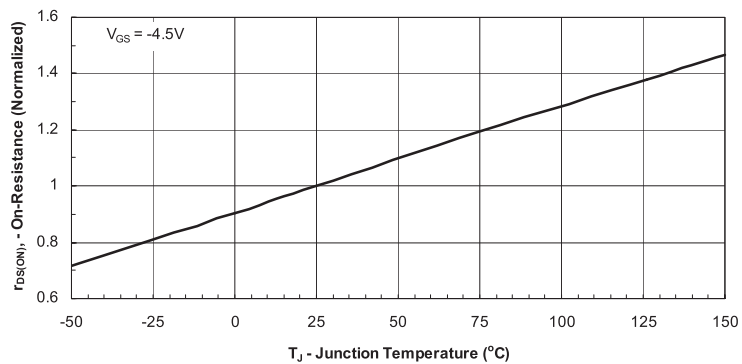
On-Resistance vs. Drain Current



Capacitance

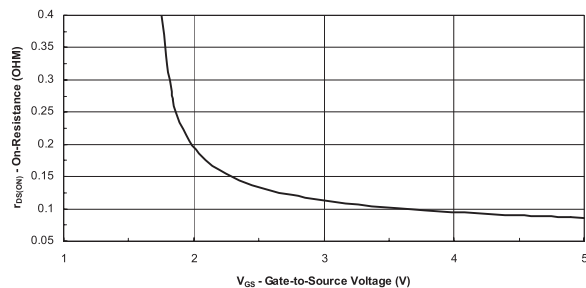
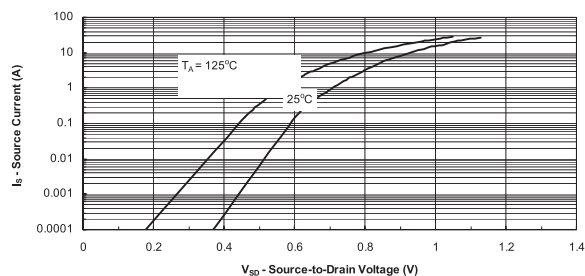


Gate Charge



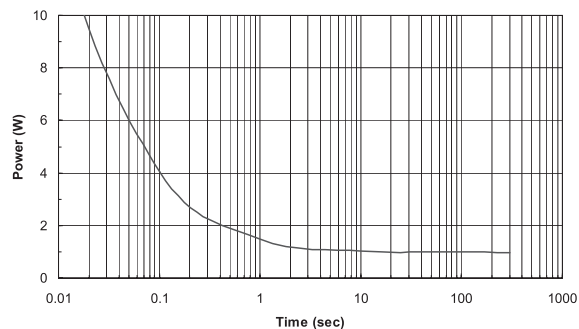
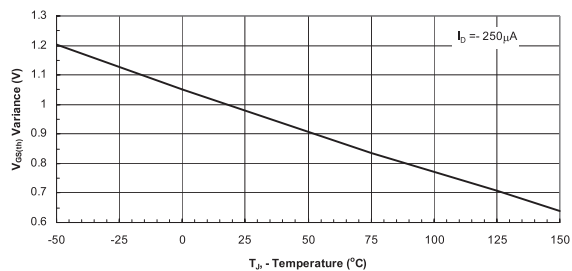
On-Resistance vs. Junction Temperature

Typical Electrical Characteristics (P-Channel)



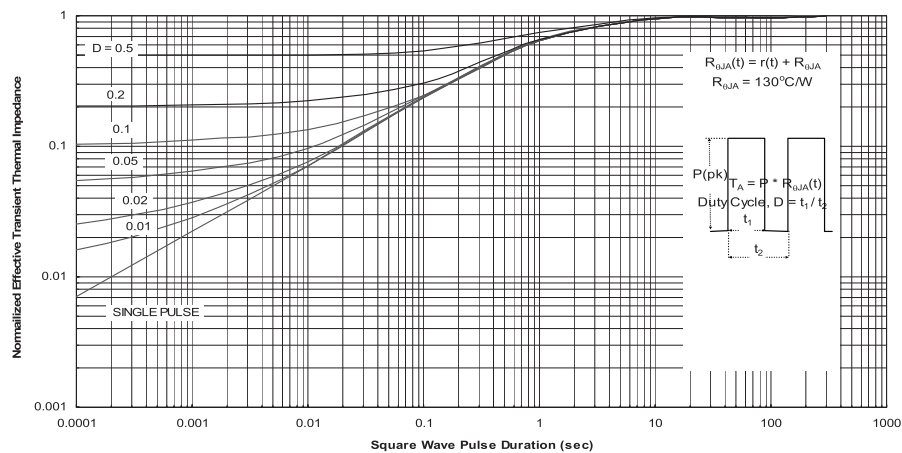
Source-Drain Diode Forward Voltage

On-Resistance vs. Gate-to Source Voltage



Threshold Voltage

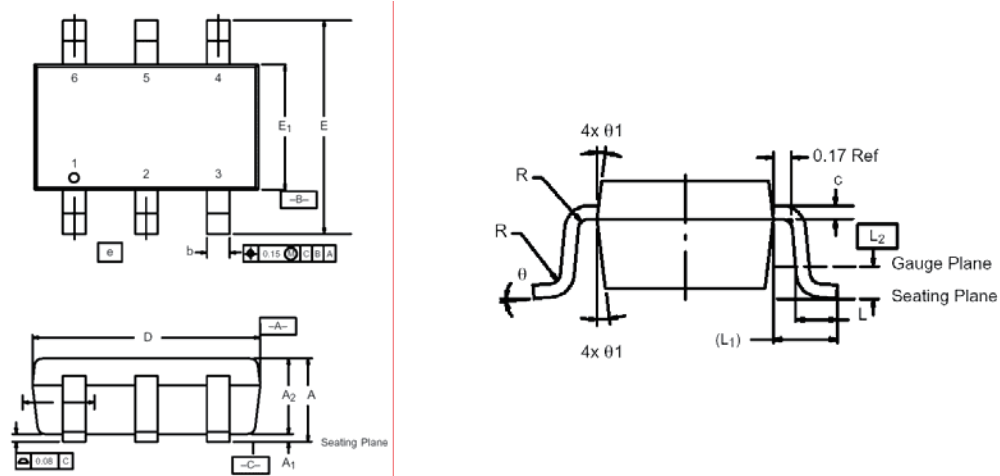
Single Pulse Power



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		