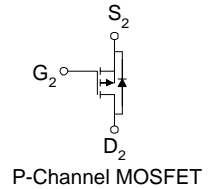
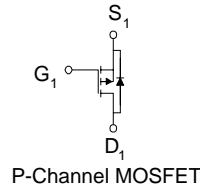
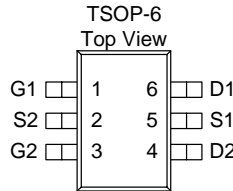


**P-Channel 30-V (D-S) MOSFET**

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)	$r_{DS(on)}$ (OHM)	$I_D$ (A)
-30	0.130 @ $V_{GS} = -10V$	-2.5
	0.190 @ $V_{GS} = -4.5V$	-1.9



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A=25^\circ C$	-2.5
		$T_A=70^\circ C$	-1.9
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-10	A
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	$\pm 1.6$	A
Power Dissipation <sup>a</sup>	$P_D$	$T_A=25^\circ C$	1.15
		$T_A=70^\circ C$	0.7
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ C$

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

Notes

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

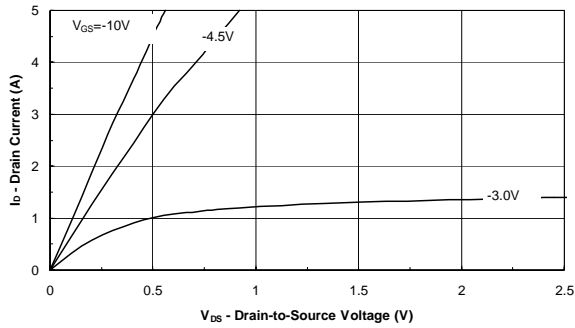
SPECIFICATIONS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-1.00			
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}$			-1	uA
		$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current <sup>A</sup>	$I_{D(on)}$	$V_{DS} = -5 \text{ V}, V_{GS} = -10 \text{ V}$	-3			A
Drain-Source On-Resistance <sup>A</sup>	$r_{DS(on)}$	$V_{GS} = -10 \text{ V}, I_D = -2.5 \text{ A}$			0.130	$\Omega$
		$V_{GS} = -4.5 \text{ V}, I_D = -1.9 \text{ A}$			0.190	
Forward Transconductance <sup>A</sup>	$g_s$	$V_{DS} = -5 \text{ V}, I_D = -2.5 \text{ A}$		3		S
Diode Forward Voltage	$V_{SD}$	$I_S = -1.6 \text{ A}, V_{GS} = 0 \text{ V}$		-0.70		V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -5 \text{ V}, V_{GS} = -4.5 \text{ V},$ $I_D = -2.5 \text{ A}$		6.0		nC
Gate-Source Charge	$Q_{gs}$			0.80		
Gate-Drain Charge	$Q_{gd}$			1.30		
Input Capacitance	$C_{iss}$	P-Channel $V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		451		pF
Output Capacitance	$C_{oss}$			130		
Reverse Transfer Capacitance	$C_{rss}$			33		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -5 \text{ V}, R_L = 5 \text{ OHM},$ $V_{GEN} = -4.5 \text{ V}, R_G = 6 \text{ OHM}$		6.5		ns
Rise Time	$t_r$			20		
Turn-Off Delay Time	$t_{d(off)}$			31		
Fall-Time	$t_f$			21		

## Notes

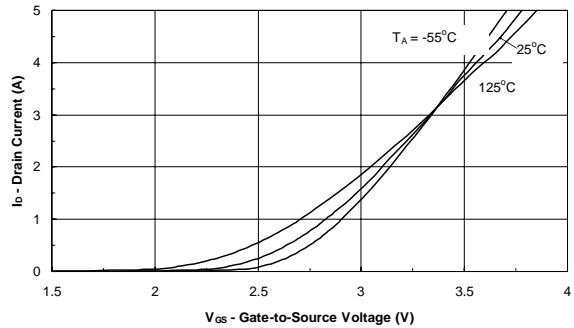
- Pulse test:  $PW \leq 300 \mu\text{s}$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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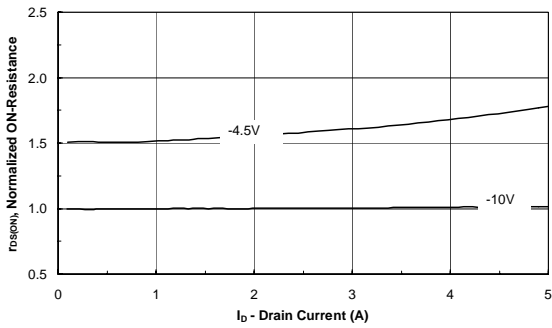
Typical Electrical Characteristics (P-Channel)



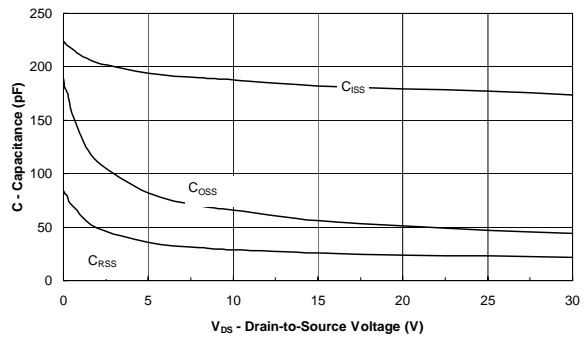
Output Characteristics



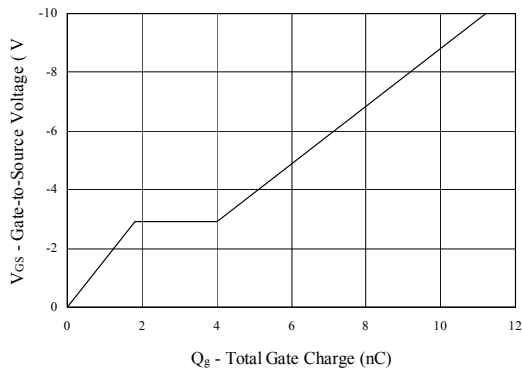
Transfer Characteristics



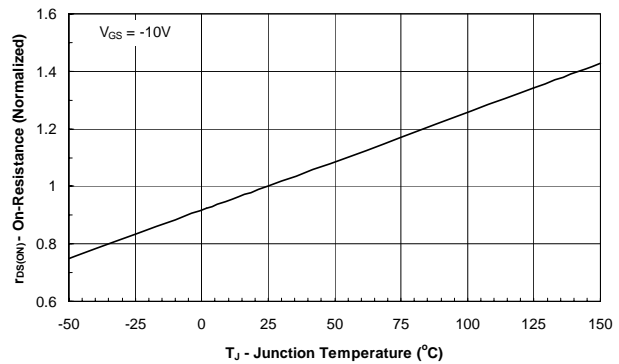
On-Resistance vs. Drain Current



Capacitance

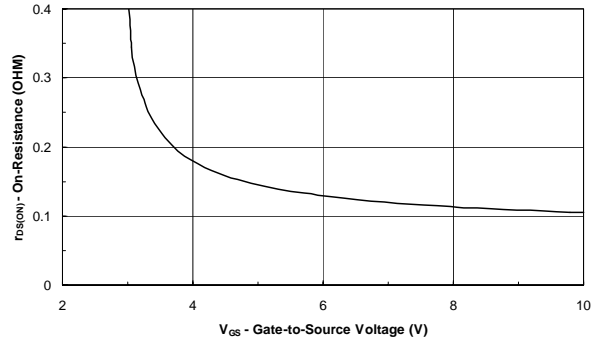
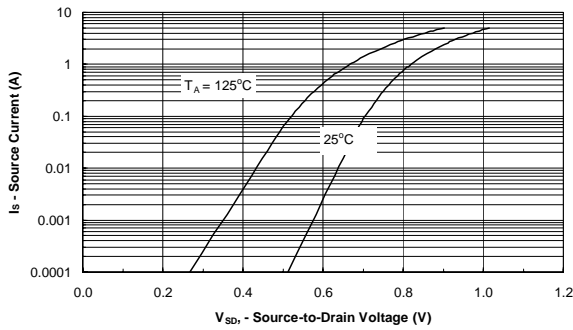


Gate Charge

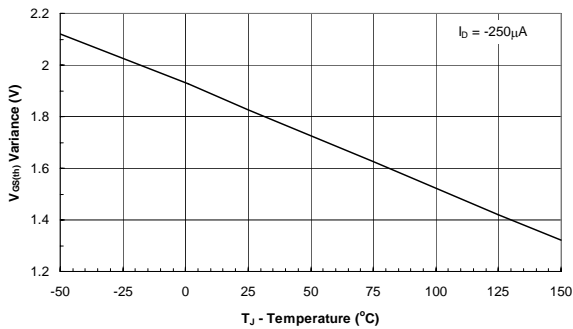


On-Resistance vs. Junction Temperature

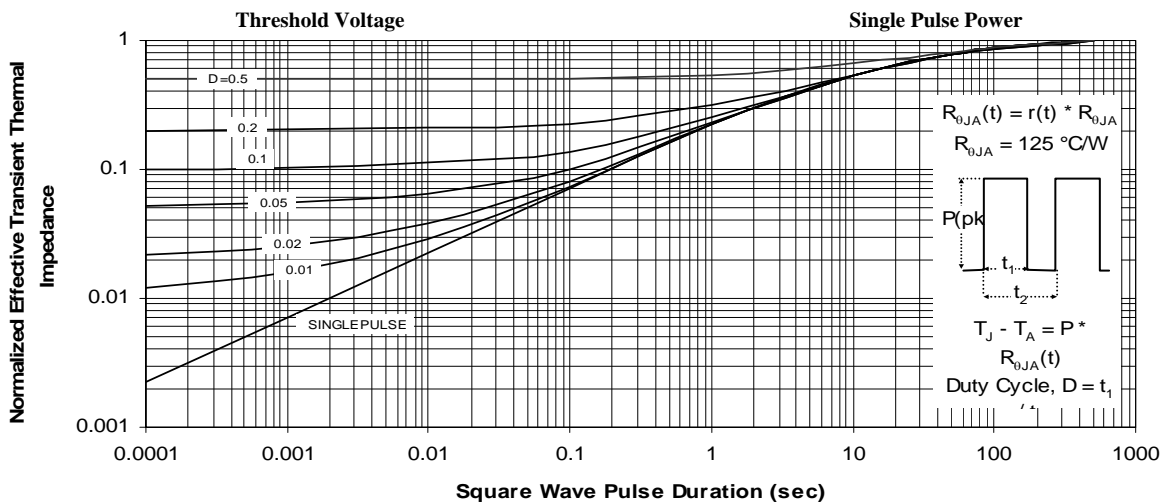
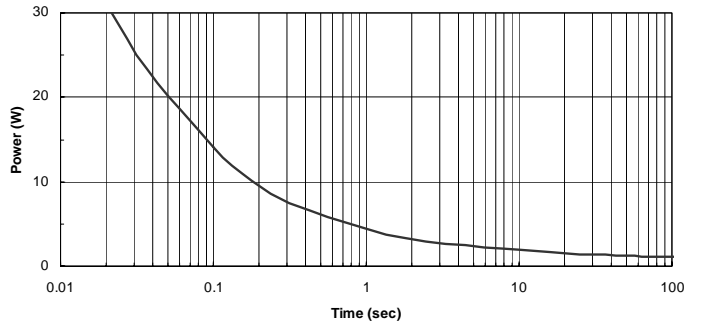
Typical Electrical Characteristics (P-Channel)



Source-Drain Diode Forward Voltage



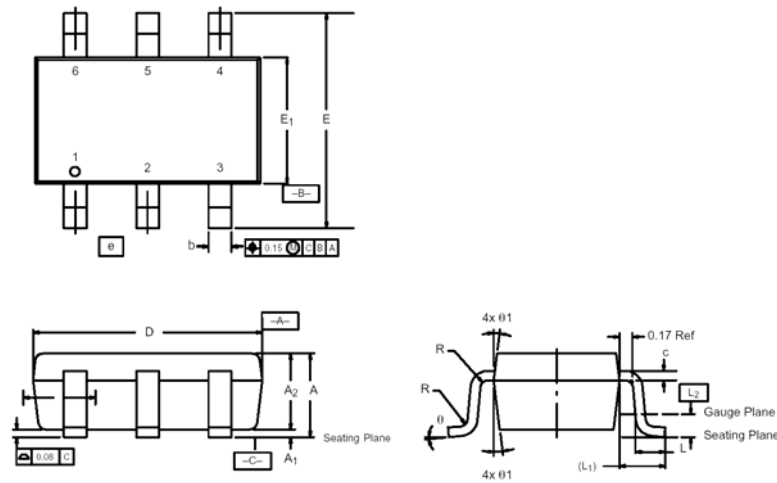
On-Resistance vs. Gate-to Source Voltage



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 <sub>1</sub>	0.01	—	0.10	0.0004	—	0.004
A <sub>2</sub>	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 <sub>1</sub>	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 <sub>1</sub>	0.60 Ref			0.024 Ref		
L <sub>2</sub>	0.25 BSC			0.010 BSC		
R	0.10	—	—	0.004	—	—
Ø	0°	4°	8°	0°	4°	8°
Ø <sub>1</sub>	7° Nom			7° Nom		