

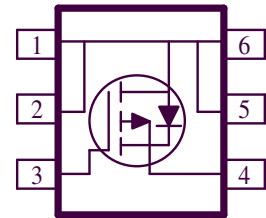
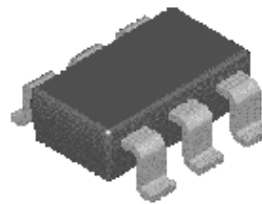
P-Channel 20-V (D-S) MOSFET

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



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FREE



PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.038 @ $V_{GS} = -4.5V$	-5.6
	0.054 @ $V_{GS} = -2.5V$	-4.8
	0.072 @ $V_{GS} = -1.8V$	-4.0

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current ^a	$T_A = 25^\circ C$	I_D	-5.6	A
	$T_A = 70^\circ C$		-4.5	
Pulsed Drain Current ^b		I_{DM}	± 20	
Continuous Source Current (Diode Conduction) ^a		I_S	-1.7	A
Power Dissipation ^a	$T_A = 25^\circ C$	P_D	2.0	W
	$T_A = 70^\circ C$		1.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ C$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$t \leq 5 \text{ sec}$	R_{THJA}	62.5	$^\circ C/W$

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- 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	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -250 uA	-20			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 uA	-0.45			
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -16 V, V _{GS} = 0 V			-1	uA
		V _{DS} = -20 V, V _{GS} = 0 V, T _J = 55°C			-5	
On-State Drain Current ^A	I _{D(on)}	V _{DS} = -5 V, V _{GS} = -4.5 V	-20			A
Drain-Source On-Resistance ^A	r _{DS(on)}	V _{GS} = -4.5 V, I _D = -5.5 A		24	38	mΩ
		V _{GS} = -2.5 V, I _D = -4.8 A		30	54	
		V _{GS} = -1.8 V, I _D = -4.0 A		43	72	
Forward Tranconductance ^A	g _{fs}	V _{DS} = -5 V, I _D = -3.5 A		23		S
Diode Forward Voltage	V _{SD}	I _S = 1.3 A, V _{GS} = 0 V		-0.70	-1.20	V
Dynamic ^b						
Total Gate Charge	Q _g	V _{DS} = -10 V, V _{GS} = -2.5 V, I _D = -3.5 A		19.0	31	nC
Gate-Source Charge	Q _{gs}			4.20		
Gate-Drain Charge	Q _{gd}			7.60		
Switching						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -10 V, R _L = 6 Ω , I _D = -1 A, V _{GEN} = -4.5 V		13	24	ns
Rise Time	t _r			12	19	
Turn-Off Delay Time	t _{d(off)}			91	140	
Fall-Time	t _f			44	73	

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)

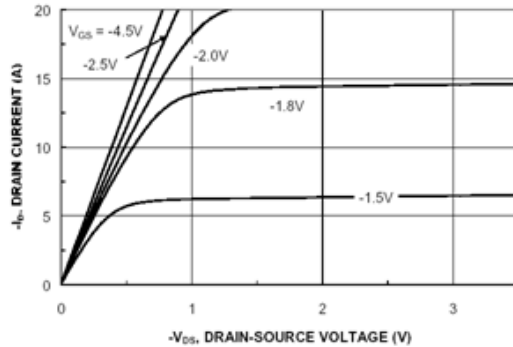


Figure 1. On-Region Characteristics.

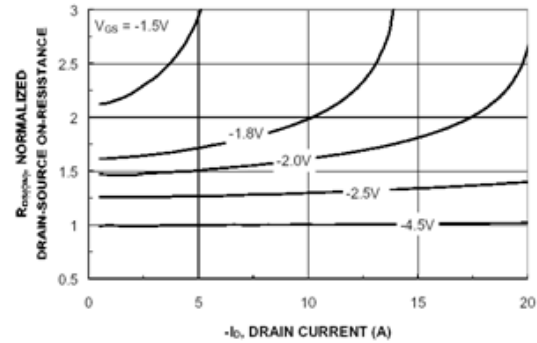


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.

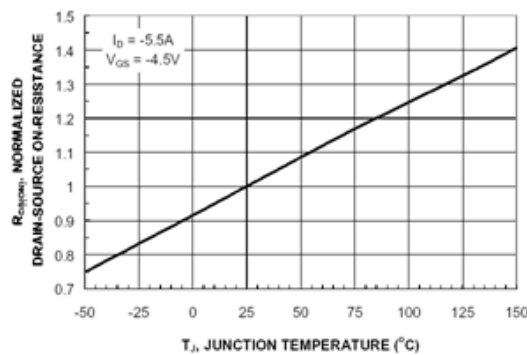


Figure 3. On-Resistance Variation with Temperature.

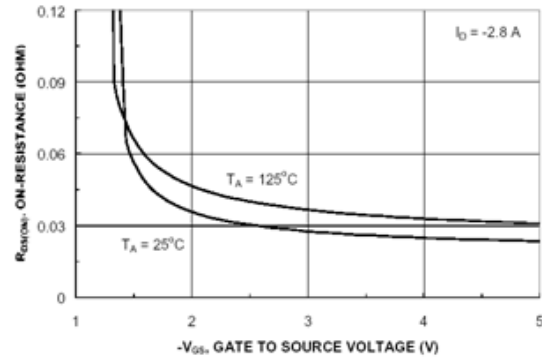


Figure 4. On-Resistance Variation with Gate-to-Source Voltage.

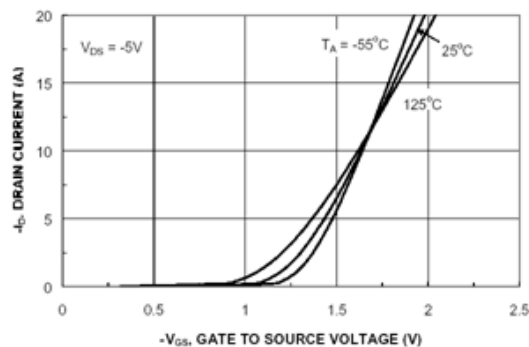


Figure 5. Transfer Characteristics.

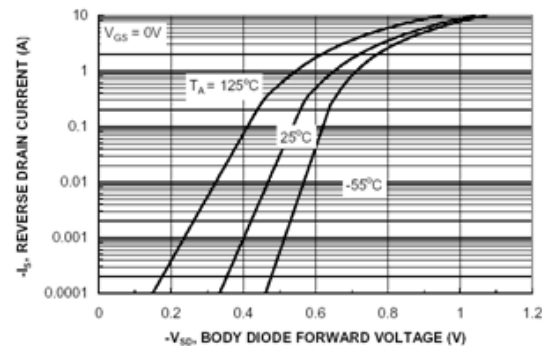


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature.

Typical Electrical Characteristics (P-Channel)

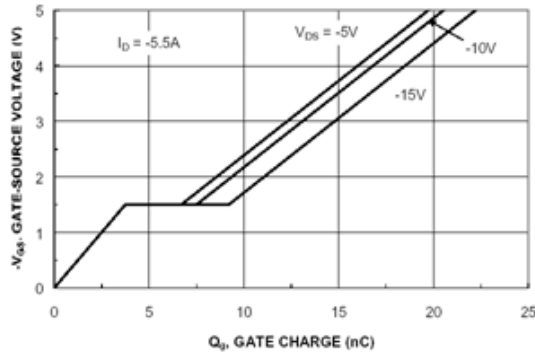


Figure 7. Gate Charge Characteristics.

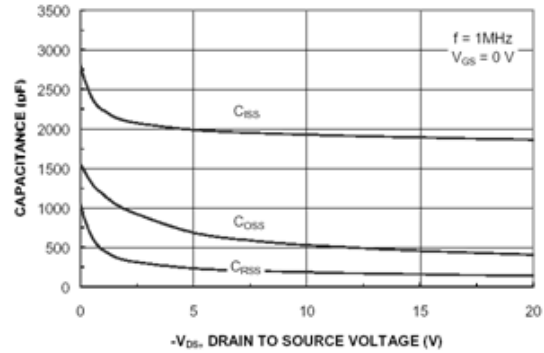


Figure 8. Capacitance Characteristics.

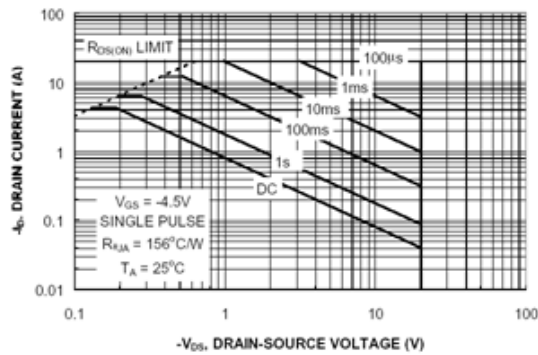


Figure 9. Maximum Safe Operating Area.

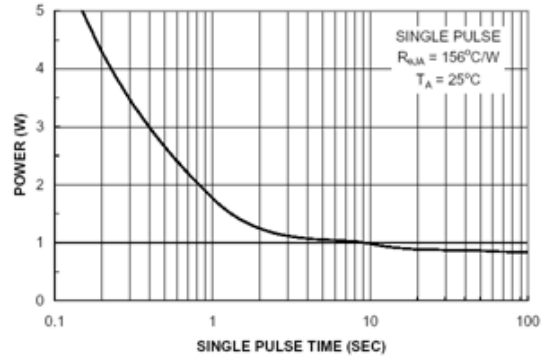


Figure 10. Single Pulse Maximum Power Dissipation.

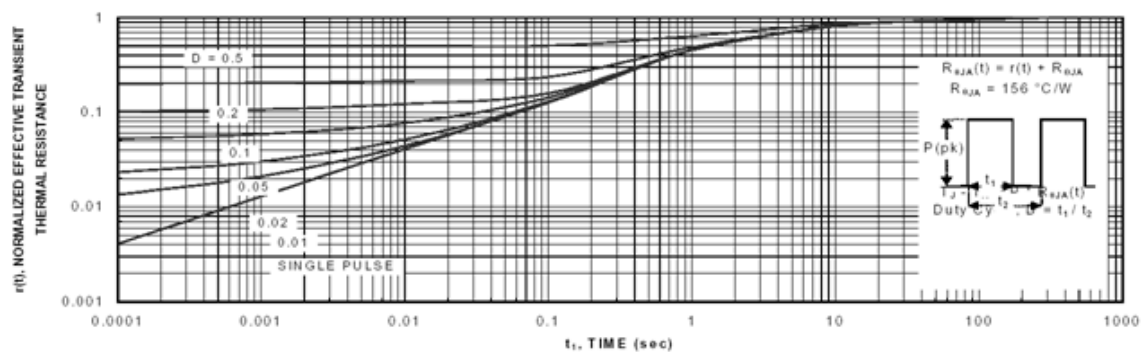
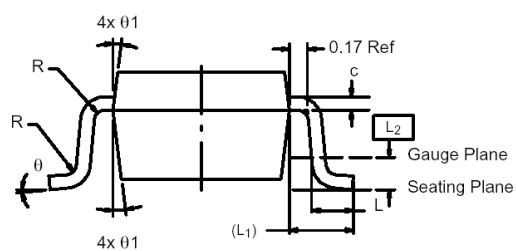
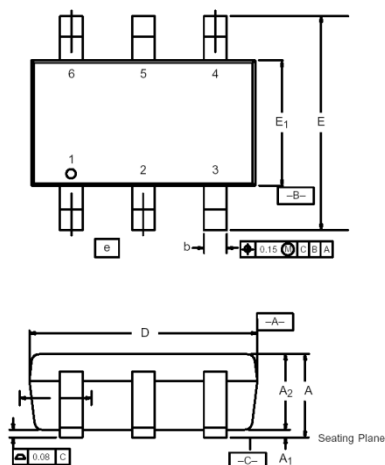


Figure 11. Transient Thermal Response Curve.

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		