

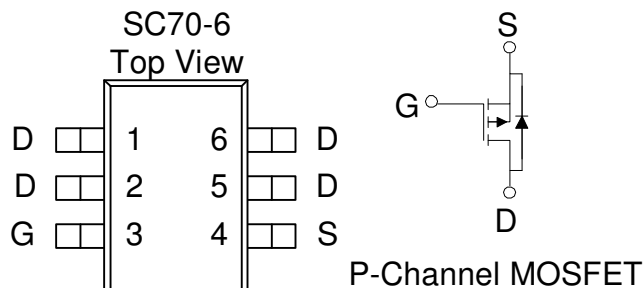
P-Channel 20-V (D-S) MOSFET

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 SC70-6 saves board space
- Fast switching speed
- High performance trench technology



PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (OHM)	I_D (A)
-20	0.079 @ $V_{GS} = -4.5V$	-3.7
	0.110 @ $V_{GS} = -2.5V$	-3.1
	0.160 @ $V_{GS} = -1.8V$	-2.6



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	I_D	$T_A = 25^\circ C$	-3.7
		$T_A = 70^\circ C$	-3.0
Pulsed Drain Current ^b	I_{DM}	-10	A
Continuous Source Current (Diode Conduction) ^a	I_S	± 1.4	A
Power Dissipation ^a	P_D	$T_A = 25^\circ C$	1.56
		$T_A = 70^\circ C$	0.81
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	R_{THJA}	$t \leq 5$ sec	80
		Steady-State	125

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
Static						
	$I_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu A$	-0.4			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 8 V$			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16 V, V_{GS} = 0 V$			-1	uA
		$V_{DS} = -16 V, V_{GS} = 0 V, T_J = 55^\circ C$			-10	
On-State Drain Current ^A	$I_{D(on)}$	$V_{DS} = -5 V, V_{GS} = -4.5 V$	-5			A
Drain-Source On-Resistance ^A	$r_{DS(on)}$	$V_{GS} = -4.5 V, I_D = -3.7 A$			79	mΩ
		$V_{GS} = -2.5 V, I_D = -3.1 A$			110	
		$V_{GS} = -1.8 V, I_D = -2.6 A$			160	
Forward Transconductance ^A	g_{fs}	$V_{DS} = -5 V, I_D = -1.25 A$		9		S
Diode Forward Voltage	V_{SD}	$I_S = -0.46 A, V_{GS} = 0 V$		-0.65		V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10 V, V_{GS} = -4.5 V,$ $I_D = -3.7 A$		7.2		nC
Gate-Source Charge	Q_{gs}			1.7		
Gate-Drain Charge	Q_{gd}			1.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10 V, I_L = -1 A,$ $V_{GEN} = -4.5 V, R_G = 6 \Omega$		10		ns
Rise Time	t_r			9		
Turn-Off Delay Time	$t_{d(off)}$			27		
Fall-Time	t_f			11		

Notes

- Pulse test: PW ≤ 300us duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Repetitive rating, pulse width limited by junction temperature.



Typical Electrical Characteristics

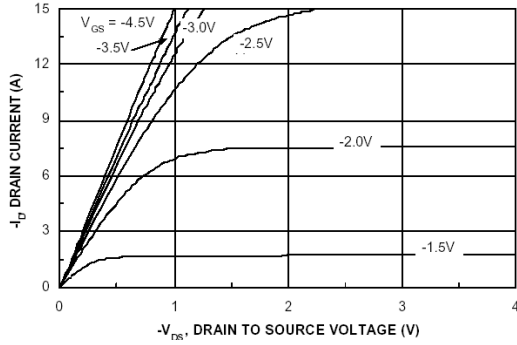


Figure 1. On-Region Characteristics

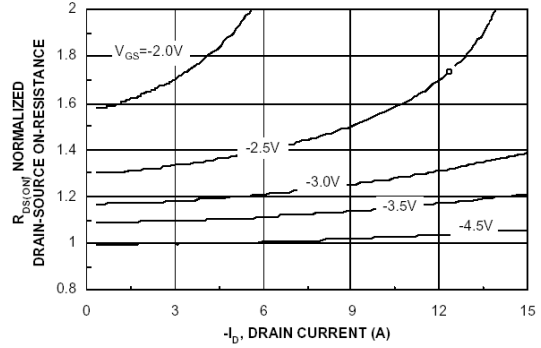


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

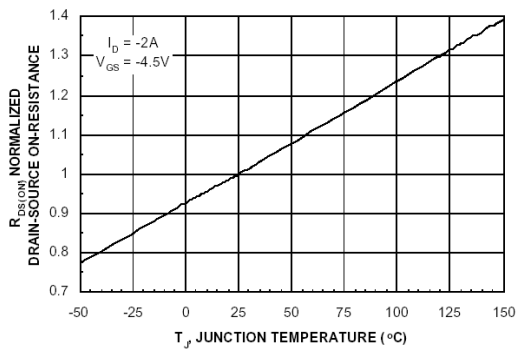


Figure 3. On-Resistance Variation with Temperature

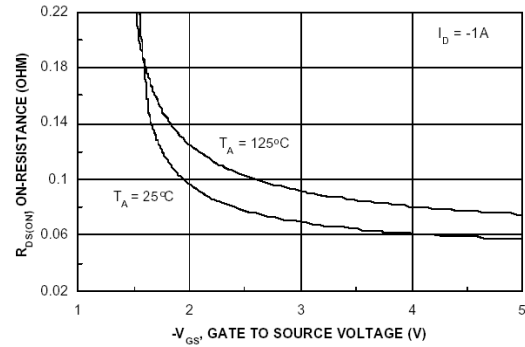


Figure 4. On-Resistance Variation with Gate to Source Voltage

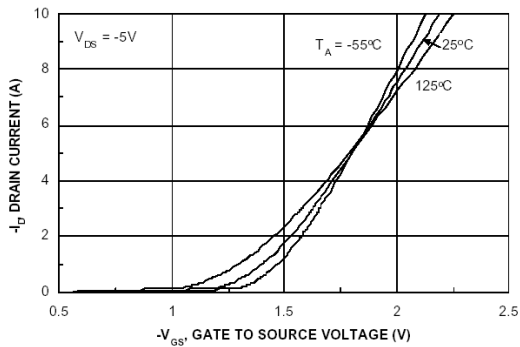


Figure 5. Transfer Characteristics

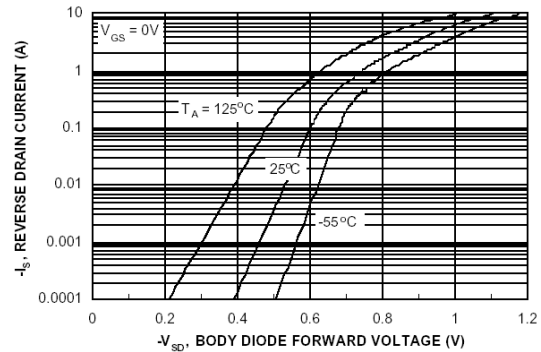


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

Typical Electrical Characteristics

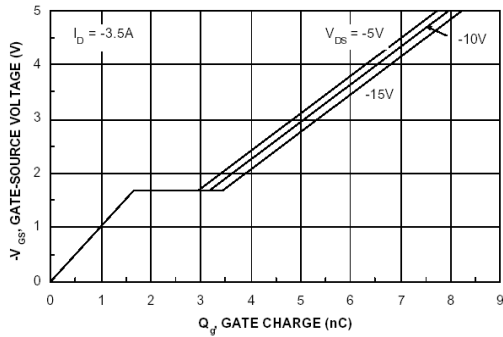


Figure 7. Gate Charge Characteristic

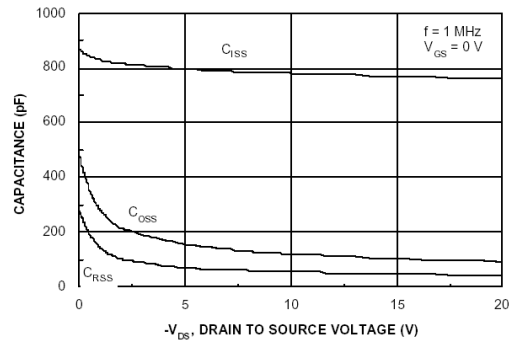


Figure 8. Capacitance Characteristic

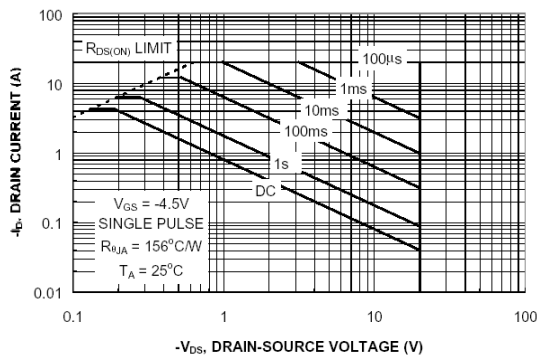


Figure 9. Maximum Safe Operating Area

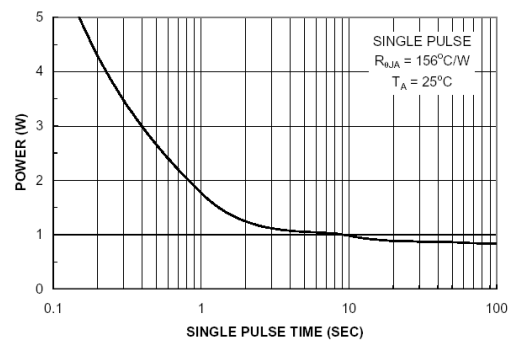


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

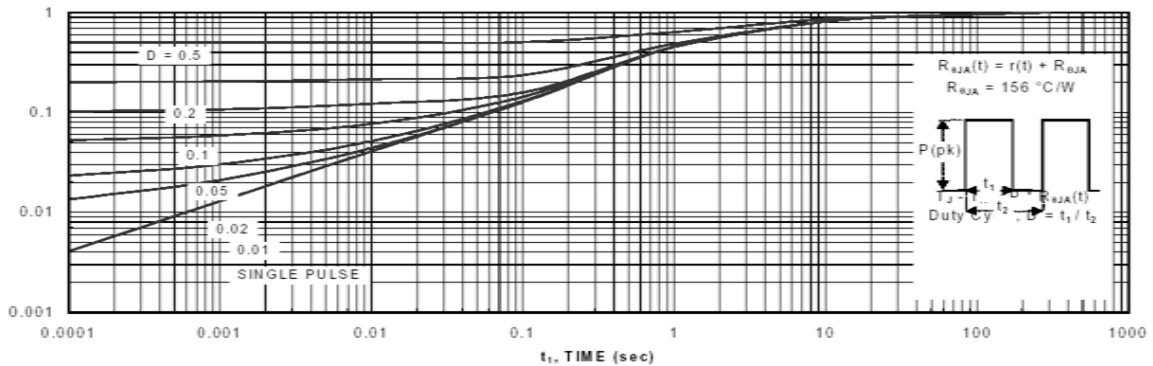
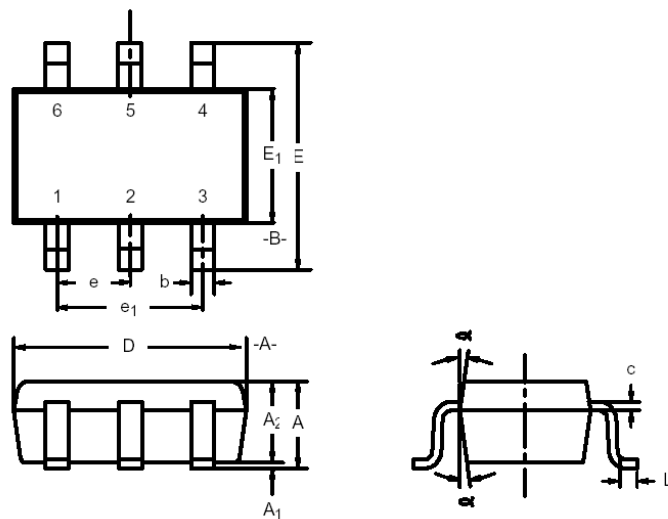


Figure 11. Transient Thermal Response Curve.

Package Information

SC-70: 6LEAD



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.90	–	1.10	0.035	–	0.043
A₁	–	–	0.10	–	–	0.004
A₂	0.80	–	1.00	0.031	–	0.039
b	0.15	–	0.30	0.006	–	0.012
c	0.10	–	0.25	0.004	–	0.010
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.80	2.10	2.40	0.071	0.083	0.094
E₁	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65BSC			0.026BSC		
e₁	1.20	1.30	1.40	0.047	0.051	0.055
L	0.10	0.20	0.30	0.004	0.008	0.012
α	7°Nom			7°Nom		