

RoHS Compliant Product
 A suffix of "-C" specifies halogen and lead-free

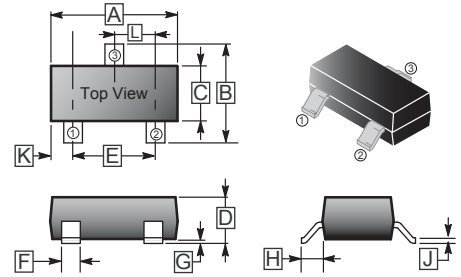
DESCRIPTION

These miniature surface mount MOSFETs utilize a 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 lower voltage application, power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low Gate Charge
- Fast switch.
- Miniature SC-59 surface mount package saves board space.

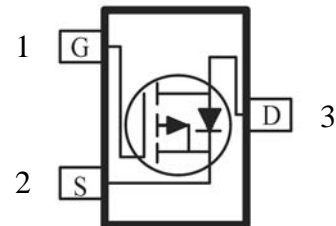
SC-59



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.10	REF.
B	2.25	3.00	H	0.40	REF.
C	1.30	1.70	J	0.10	0.20
D	1.00	1.40	K	0.45	0.55
E	1.70	2.30	L	0.85	1.15
F	0.35	0.50			

PACKAGE INFORMATION

Package	MPQ	LeaderSize
SC-59	3K	7' inch



ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D @ T_A=25^\circ\text{C}$	-0.9	A
	$I_D @ T_A=70^\circ\text{C}$	-0.75	A
Pulsed Drain Current ²	I_{DM}	-10	A
Continuous Source Current (Diode Conduction) ¹	I_S	0.4	A
Power Dissipation ¹	$P_D @ T_A=25^\circ\text{C}$	0.5	W
	$P_D @ T_A=70^\circ\text{C}$	0.42	W
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ 150	$^\circ\text{C}$
Thermal Resistance Data			
Maximum Junction to Ambient ¹	$t \leq 5 \text{ sec}$	250	$^\circ\text{C} / \text{W}$
	Steady State	285	

Notes:

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Switch Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-30	-	-	V	$V_{DS} = 0V, I_D = -250\mu A$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0V, V_{GS} = \pm 20V$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS} = -24V, V_{GS} = 0V$
		-	-	-10		$V_{DS} = -24V, V_{GS} = 0V, T_J = 55^\circ\text{C}$
Switch On Characteristics						
Gate-Threshold Voltage	$V_{GS(th)}$	-0.8	-1.7	-2.6	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
On-State Drain Current ¹	$I_{D(on)}$	-2	-	-	A	$V_{DS} = -5V, V_{GS} = -4.5V$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	250	300	m Ω	$V_{GS} = -10V, I_D = -1A$
		-	530	660		$V_{GS} = -4.5V, I_D = -0.9A, T_J = 55^\circ\text{C}$
		-	450	500		$V_{GS} = -4.5V, I_D = -0.9A$
Forward Transconductance ¹	g_{fs}	-	2	-	S	$V_{DS} = -5V, I_D = -1.1A$
Diode Forward Voltage	V_{SD}	-	-0.7	-1.2	V	$I_S = -0.4A, V_{GS} = 0V$
Dynamic ²						
Total Gate Charge	Q_g	-	2	3	nC	$V_{DS} = -10V, V_{GS} = -5V, I_D = -0.9A$
Gate-Source Charge	Q_{gs}	-	0.5	-		
Gate-Drain Charge	Q_{gd}	-	1.1	-		
Switching						
Turn-on Delay Time	$T_{d(on)}$	-	8	16	nS	$V_{DS} = -10V, V_{GEN} = -10V, R_G = 50\Omega, I_D = -0.9A$
Rise Time	T_r	-	16	32		
Turn-off Delay Time	$T_{d(off)}$	-	36	93		
Fall Time	T_f	-	33	94		

Notes:

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

CHARACTERISTICS CURVE

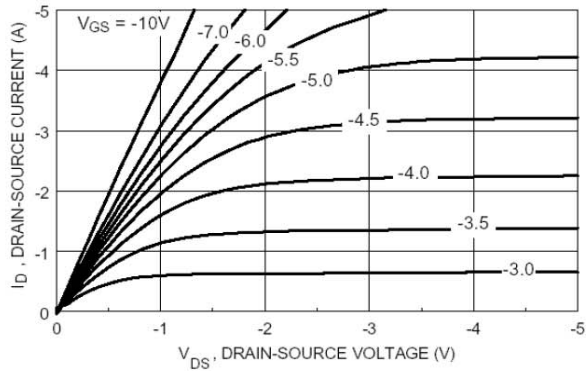


Figure 1. On-Region Characteristics

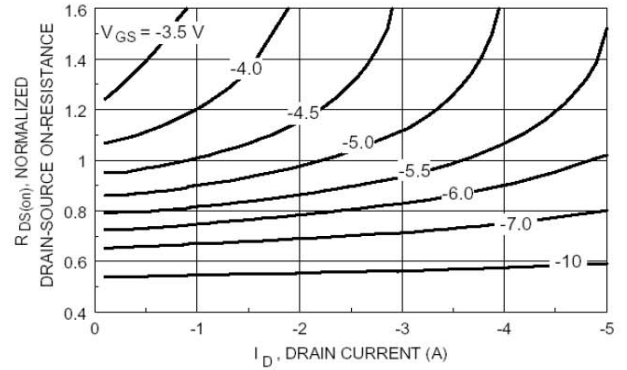


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

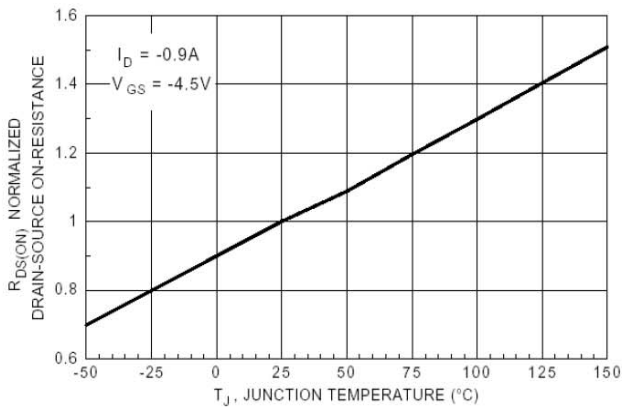


Figure 3. On-Resistance Variation with Temperature

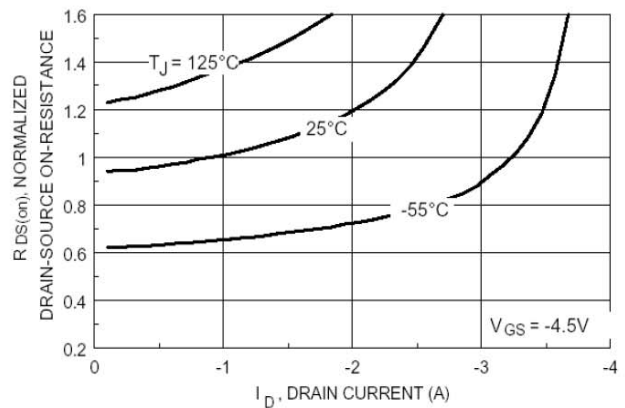


Figure 4. On-Resistance Variation with Gate to Source Voltage

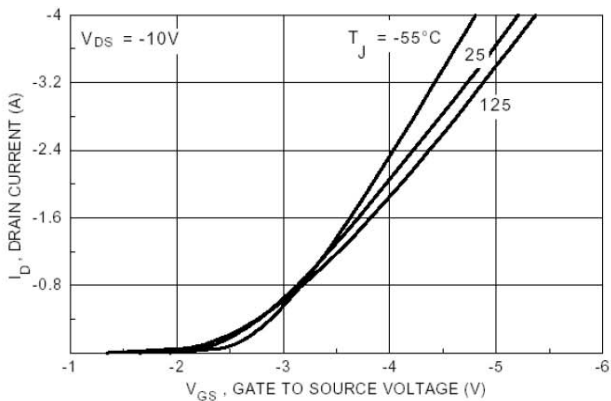


Figure 5. Transfer Characteristics

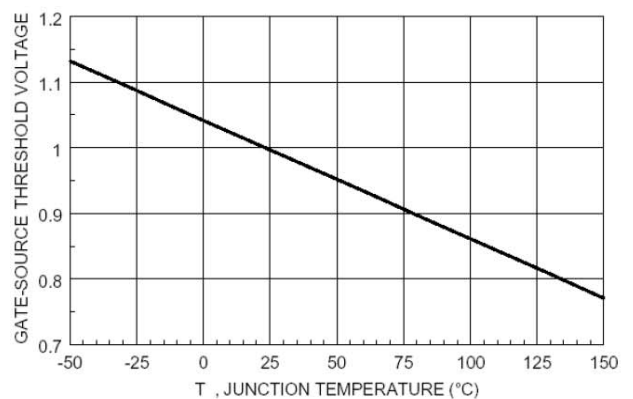


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTICS CURVE

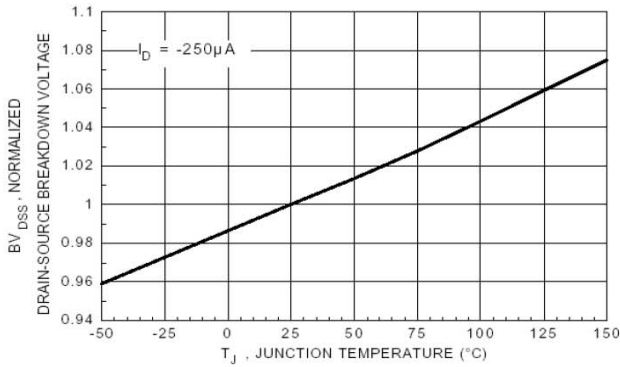


Figure 7. Breakdown Voltage With Temperature

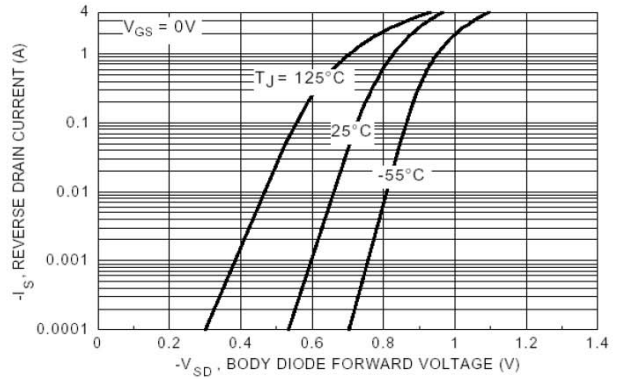


Figure 8. Body Diode Forward Voltage With Source Current & Temperature

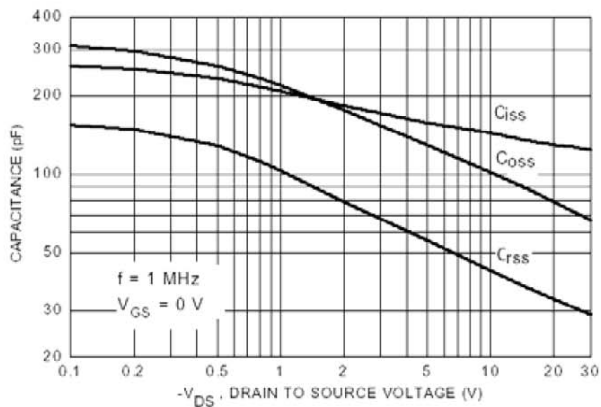


Figure 9. Capacitance Characteristic

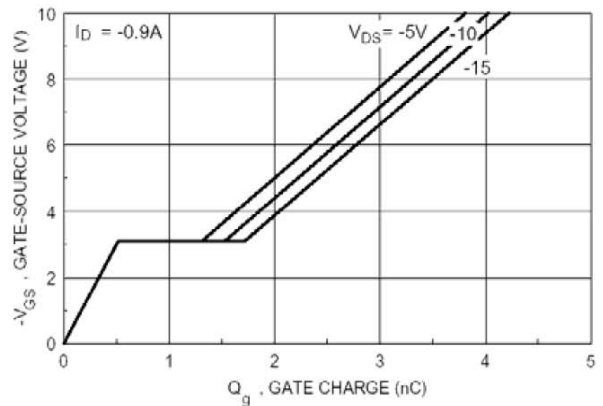


Figure 10. Gate Charge Characteristic

Normalized Thermal Transient Impedance, Junction to Ambient

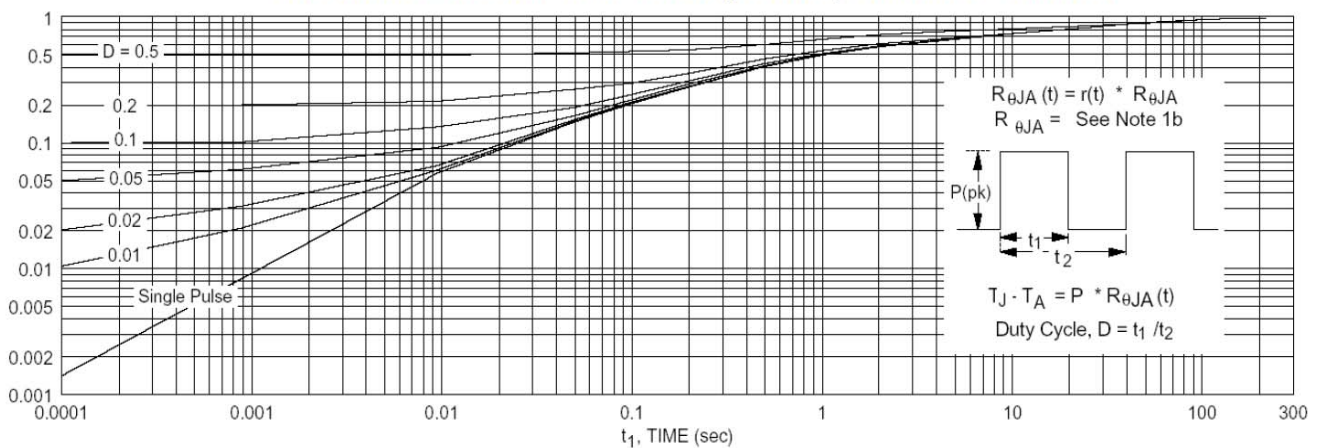


Figure 11. Transient Thermal Response Curve

CHARACTERISTICS CURVE

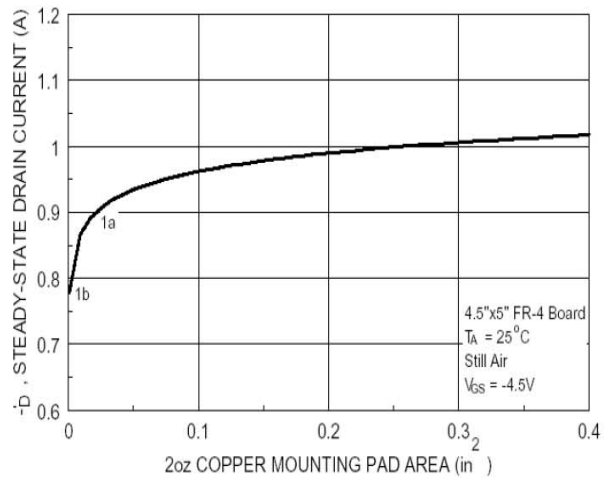
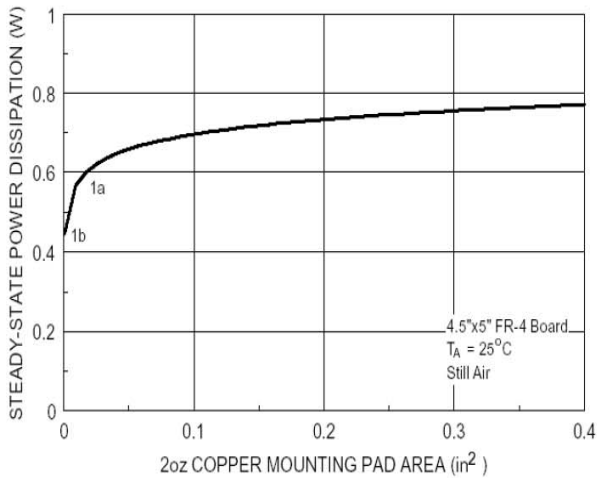
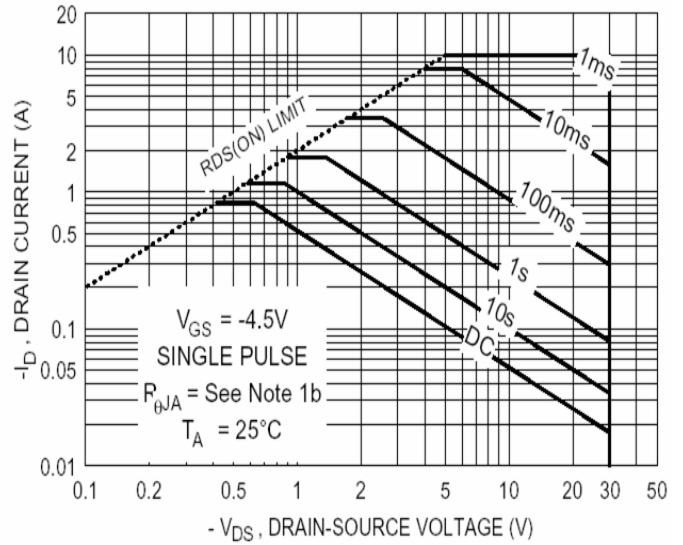
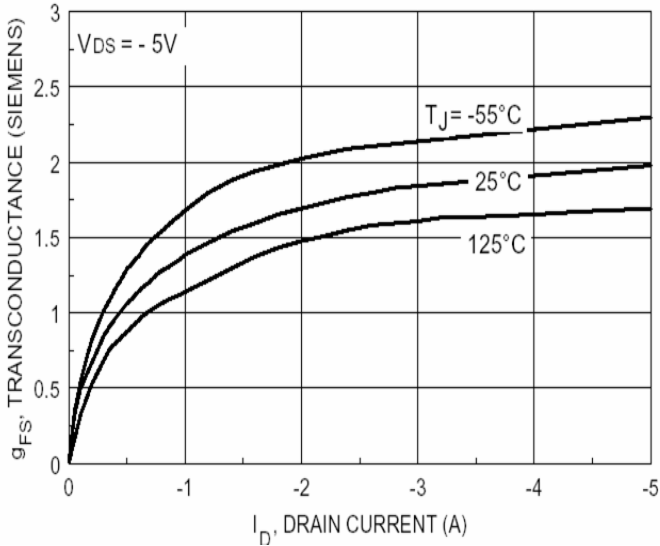


Figure 15. SOT-3 Maximum Steady-State Variation Power Dissipation versus Copper Pad Area

Figure 16. Maximum State-State Drain Current Versus Copper Pad Area