

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

DESCRIPTION

The 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.

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Fast Switch.
- Low Gate Charge.
- Miniature SC-59 Surface Mount Package Saves Board Space.

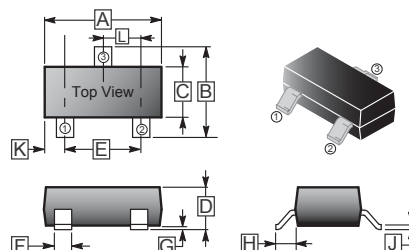
APPLICATION

Voltage control small signal switch, power management in portable and battery-powered products such as computer portable electronics and other battery power application.

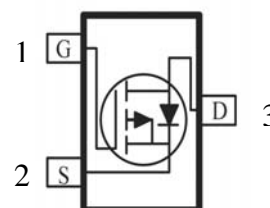
PACKAGE INFORMATION

Package	MPQ	Leader Size
SC-59	3K	7' inch

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			



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	$T_A=25^\circ\text{C}$	-2.1
		$T_A=70^\circ\text{C}$	-1.7
Pulsed Drain Current ²	I_{DM}	± 10	A
Continuous Source Current (Diode Conduction) ¹	I_S	-0.4	A
Power Dissipation ¹	P_D	$T_A=25^\circ\text{C}$	1.25
		$T_A=70^\circ\text{C}$	0.8
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$
Thermal Resistance Data			
Maximum Junction to Ambient ¹	$R_{\theta JA}$	$t \leq 5$ sec	250
		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
Static						
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS} = -24\text{V}, V_{GS}=0$
		-	-	-10		$V_{DS} = -24\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0, V_{GS} = \pm 20\text{V}$
Gate-Threshold Voltage	$V_{GS(th)}$	-1.3	-	-	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
On-State Drain Current ¹	$I_{D(ON)}$	-3	-	-	A	$V_{DS} = -5\text{V}, V_{GS} = -4.5\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	200	m Ω	$V_{GS} = -10\text{V}, I_D = -2.1\text{A}$
		-	-	300		$V_{GS} = -4.5\text{V}, I_D = -1.7\text{A}$
Forward Transconductance ¹	g_{FS}	-	2	-	S	$V_{DS} = -5\text{V}, I_D = -2.1\text{A}$
Diode Forward Voltage	V_{SD}	-	-0.7	-1.2	V	$I_S = -0.4\text{A}, V_{GS}=0$
Dynamic ²						
Total Gate Charge	Q_g	-	3.4	-	nC	$I_D = -2.1\text{A}$ $V_{DS} = -10\text{V}$ $V_{GS} = -5\text{V}$
Gate-Source Charge	Q_{gs}	-	0.8	-		
Gate-Drain Charge	Q_{gd}	-	1.5	-		
Turn-On Delay Time	$T_{d(ON)}$	-	8	-	nS	$V_{DS} = -10\text{V}$ $V_{GEN} = -10\text{V}$ $R_G = 50\Omega$ $I_D = -1.1\text{A}$
Rise Time	T_r	-	18	-		
Turn-Off Delay Time	$T_{d(OFF)}$	-	52	-		
Fall Time	T_f	-	39	-		

Notes:

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

CHARACTERISTIC CURVE

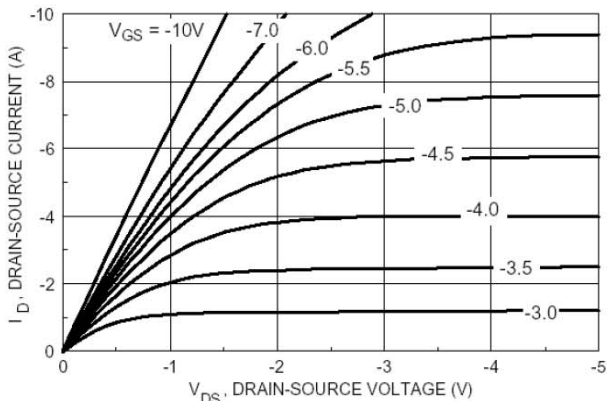


Figure 1. On-Region Characteristics

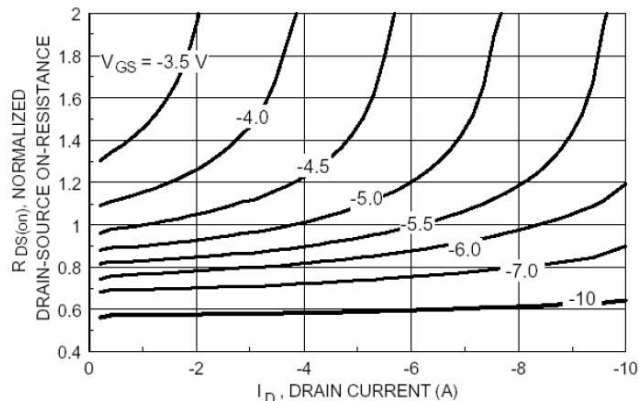


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

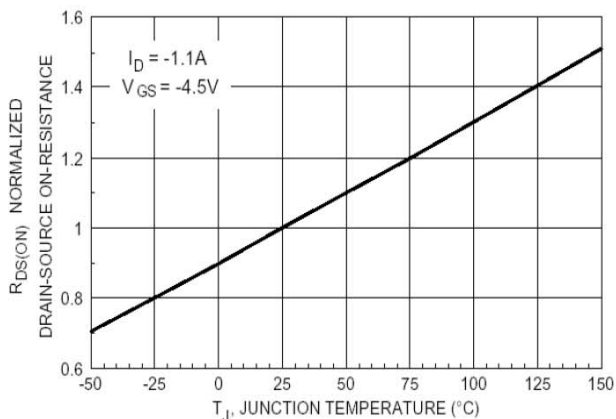


Figure 3. On-Resistance Variation with Temperature

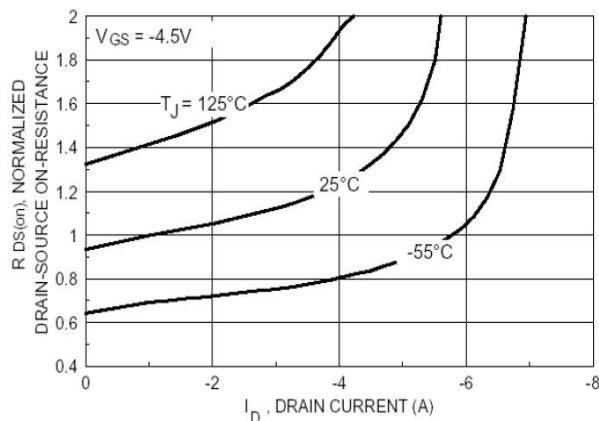


Figure 4. On-Resistance Variation with Gate to Source Voltage

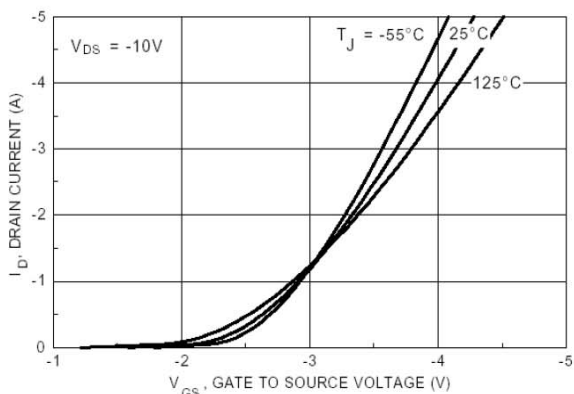


Figure 5. Transfer Characteristics

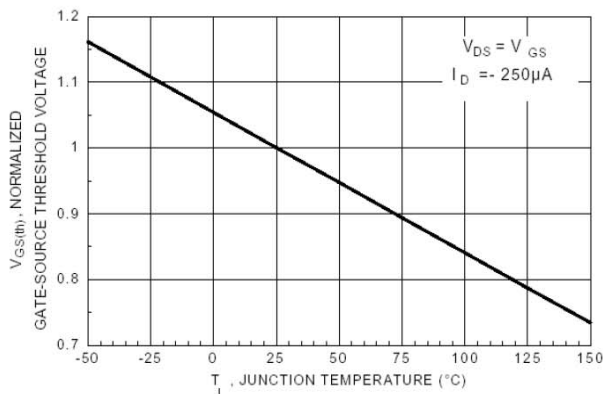


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

CHARACTERISTIC CURVE

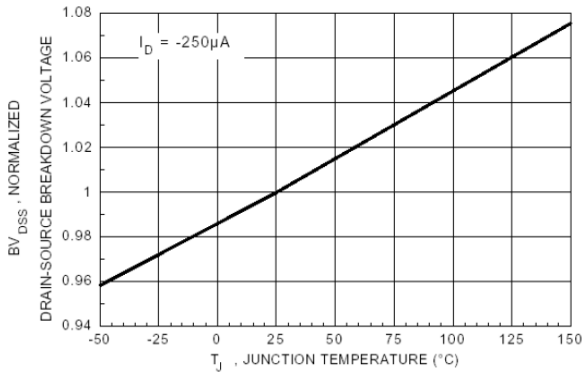


Figure 7. Breakdown Voltage Variation with Temperature.

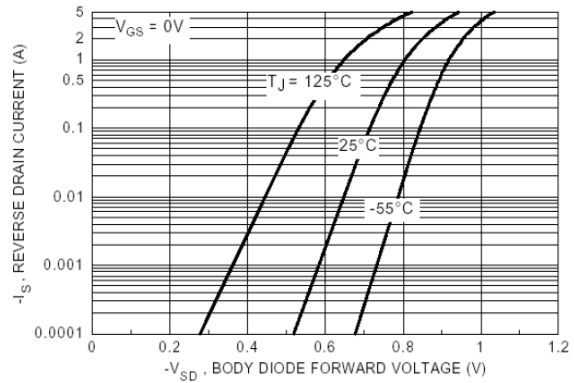


Figure 8. Body Diode Forward Voltage Variation with Source Current and Temperature.

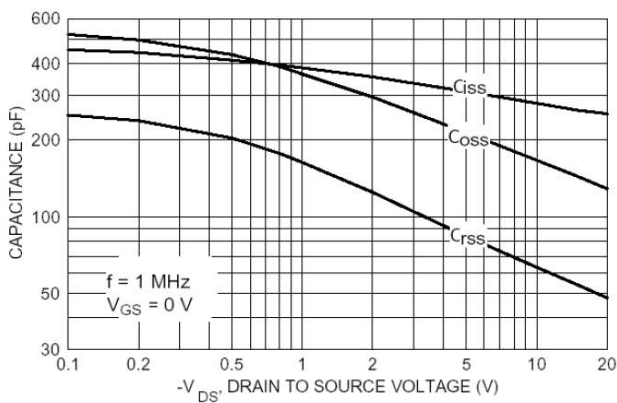


Figure 9. Capacitance Characteristic

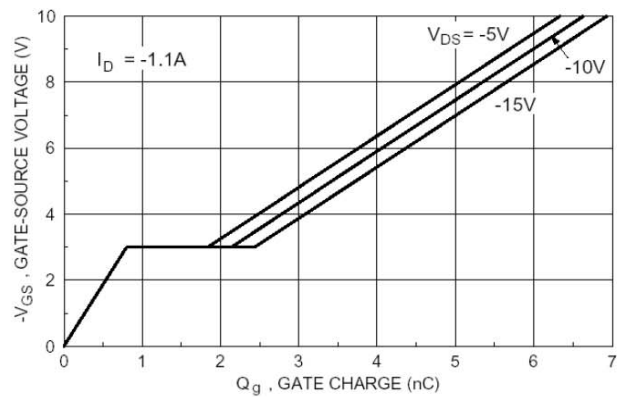


Figure 10. Gate Charge Characteristic

Normalized Thermal Transient Impedance, Junction to Ambient

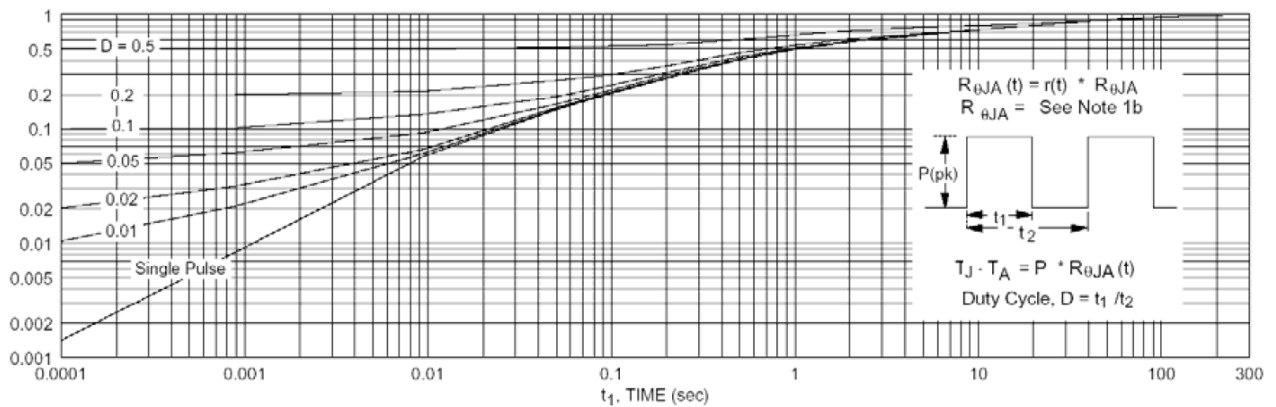


Figure 11. Transient Thermal Response Curve

CHARACTERISTIC CURVE

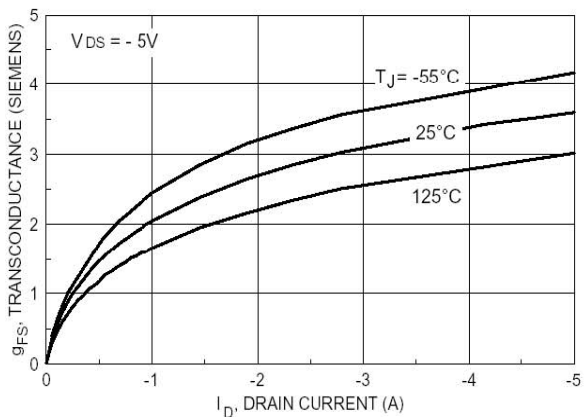


Figure 12. Transconductance Variation With Current & Temperature

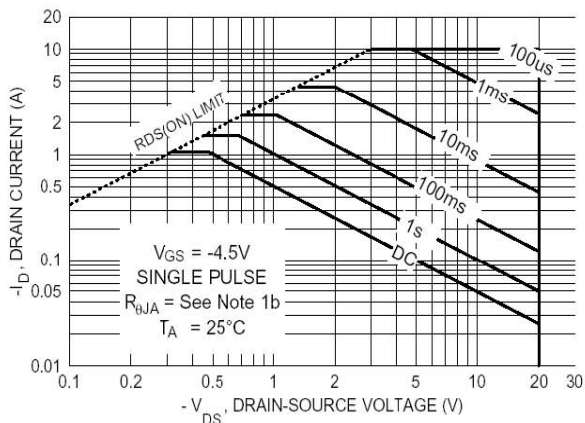


Figure 13. Maximum Safe Operation Area

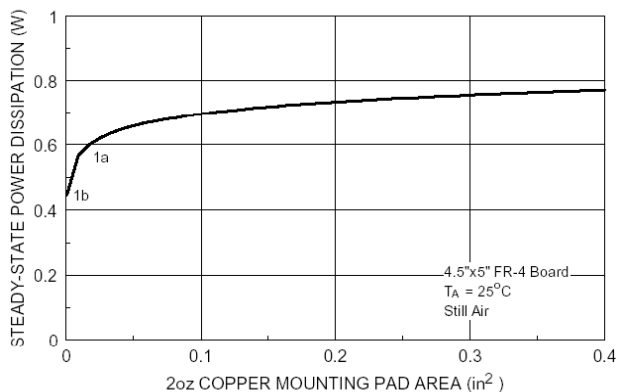


Figure 14. SOT-3 Maximum Steady-State Variation Power Dissipation versus Copper Pad Area

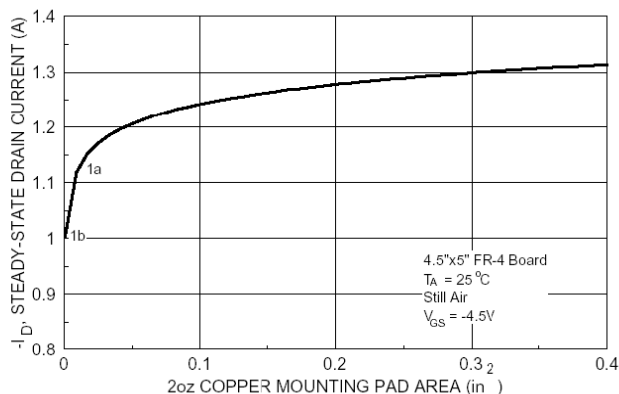


Figure 15. Maximum Steady-State Drain Current versus Copper Pad Area