

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

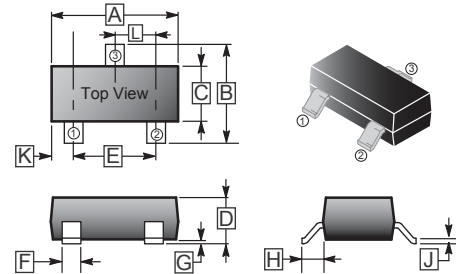
DESCRIPTION

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 power switch, 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.

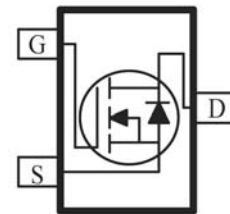
SC-59



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°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Ratings	Unit	
Drain-Source Voltage	V _{DS}	20	V	
Gate-Source Voltage	V _{GS}	±12	V	
Continuous Drain Current ¹	I _D @ T _A =25°C	4.0	A	
	I _D @ T _A =70°C	3.1	A	
Pulsed Drain Current ²	I _{DM}	±20	A	
Continuous Source Current (Diode Conduction) ¹	I _S	1.6	A	
Power Dissipation ¹	P _D @ T _A =25°C	1.3	W	
	P _D @ T _A =70°C	0.8	W	
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55 ~ 150	°C	
Thermal Resistance Ratings				
Maximum Junction to Ambient ¹	t ≤ 5 sec	R _{θJA}	100	°C / W
	Steady State		166	

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
Gate-Threshold Voltage	$V_{GS(th)}$	0.7	-	-	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS}=0\text{V}$, $V_{GS}=\pm 8\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=16\text{V}$, $V_{GS}=0\text{V}$
		-	-	10		$V_{DS}=16\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	10	-	-	A	$V_{DS}=5\text{V}$, $V_{GS}=4.5\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	32	m Ω	$V_{GS}=4.5\text{V}$, $I_D=4.6\text{A}$
		-	-	44		$V_{GS}=2.5\text{V}$, $I_D=3.9\text{A}$
Forward Transconductance ¹	g_{fs}	-	11.3	-	S	$V_{DS}=10\text{V}$, $I_D=4.0\text{A}$
Diode Forward Voltage	V_{SD}	-	0.75	-	V	$I_S=1.6\text{A}$, $V_{GS}=0\text{V}$
Dynamic ²						
Total Gate Charge	Q_g	-	13.4	-	nC	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=4.0\text{A}$
Gate-Source Charge	Q_{gs}	-	0.9	-		
Gate-Drain Charge	Q_{gd}	-	2.0	-		
Turn-on Delay Time	$T_{d(on)}$	-	8	-	nS	$V_{DD}=10\text{V}$, $V_{GEN}=4.5\text{V}$, $R_L=15\Omega$, $I_D=1\text{A}$
Rise Time	T_r	-	24	-		
Turn-off Delay Time	$T_{d(off)}$	-	35	-		
Fall Time	T_f	-	10	-		
Source-Drain Reverse Recovery Time	T_{rr}	-	40	-		$I_F=1.6\text{A}$, $di/dt=100\text{A}/\mu\text{S}$

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

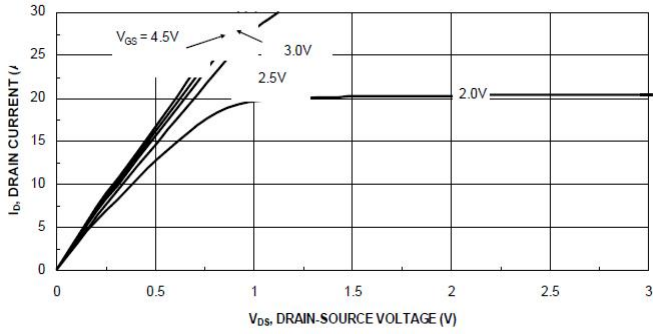


Figure 1. Output Characteristics

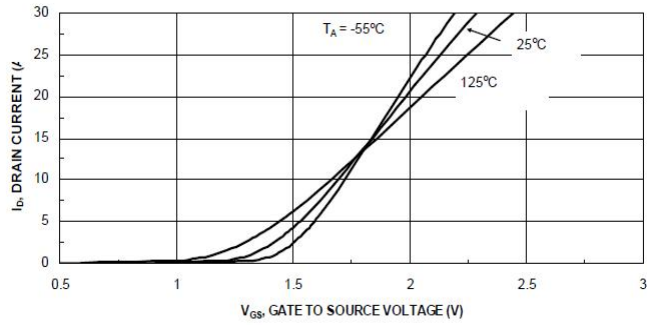


Figure 2. Transfer Characteristics

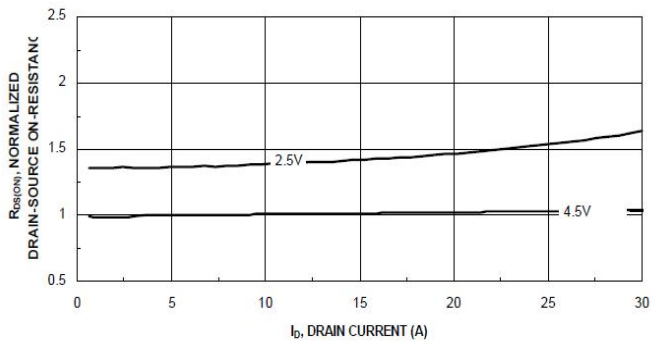


Figure 3. On-Resistance vs. Drain Current

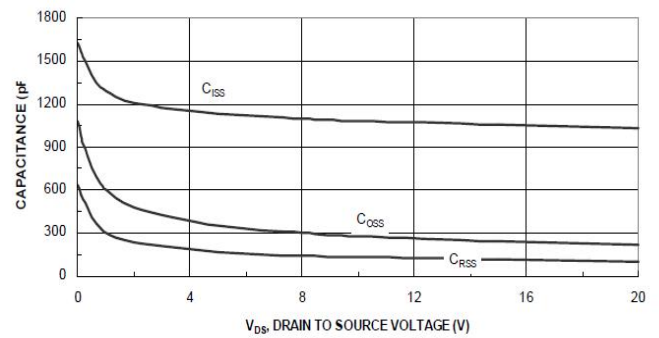


Figure 4. Capacitance

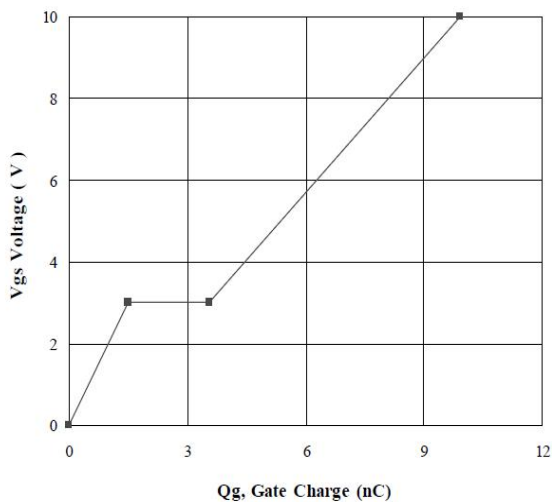


Figure 5. Gate Charge

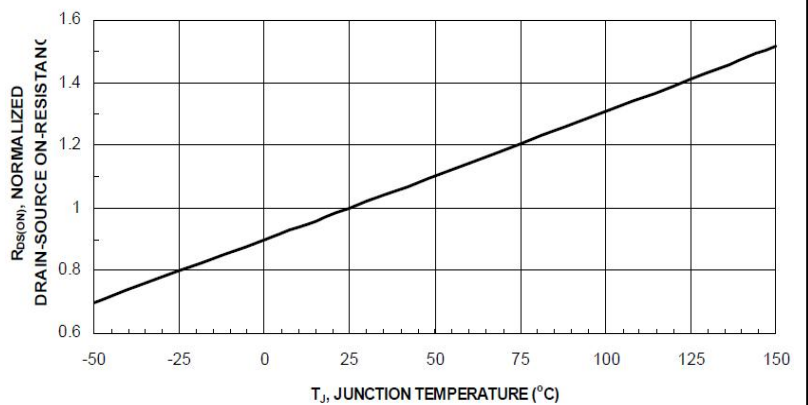


Figure 6. On-Resistance vs. Junction Temperature

CHARACTERISTIC CURVE

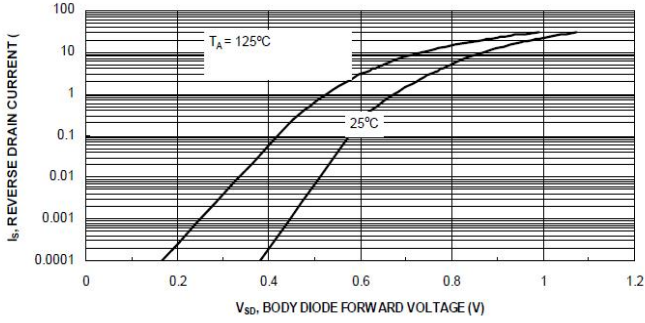


Figure 7. Source-Drain Diode Forward Voltage

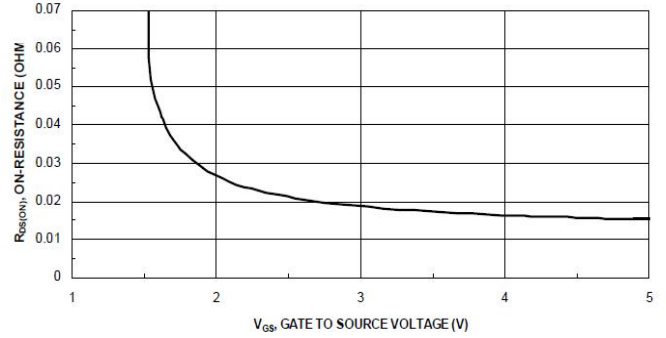


Figure 8. On-Resistance vs. Gate-to-Source Voltage

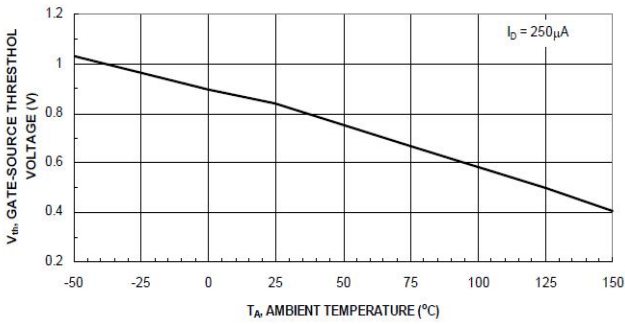


Figure 9. Threshold Voltage

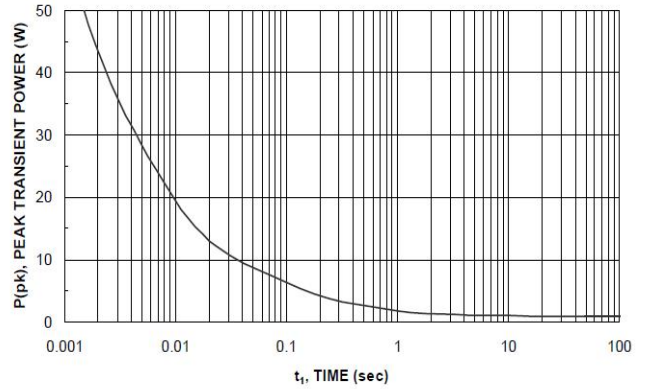


Figure 10. Single Pulse Power

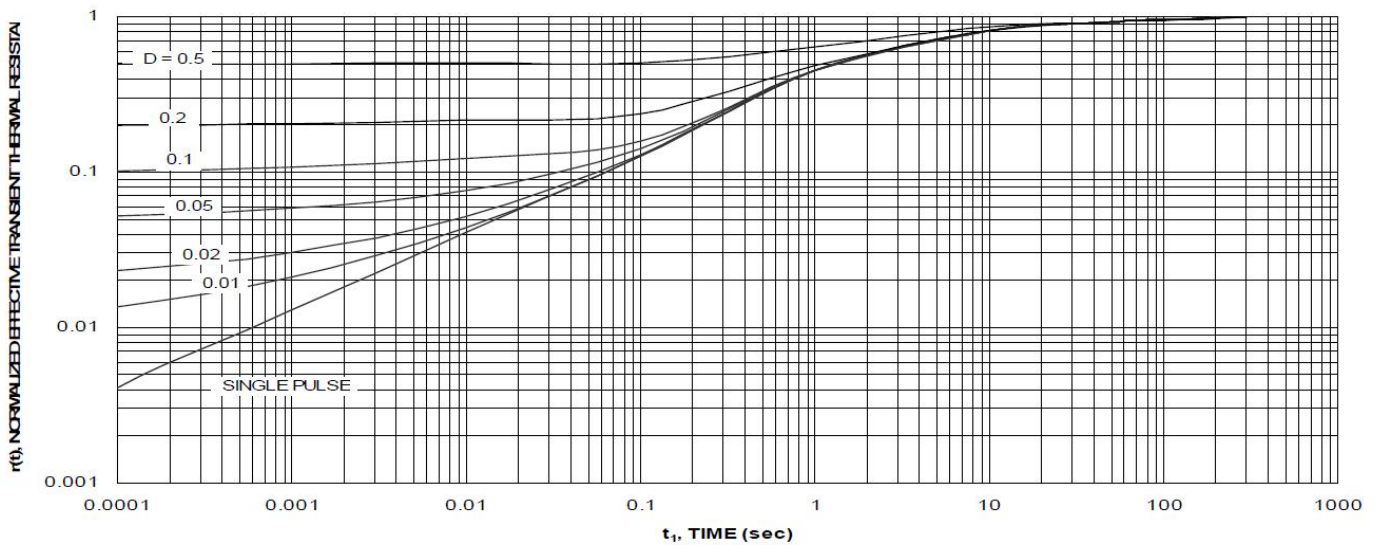


Figure 11. Normalized Thermal Transient Impedance, Junction-to-Ambient