

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.

FEATURES

- Low R_{DS(on)} provides higher efficiency and extends battery life.
- Low gate charge
- Fast switching
- Miniature SC-59 surface mount package saves board space.

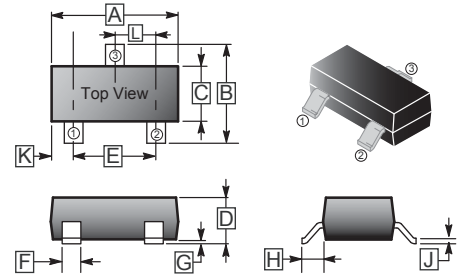
APPLICATION

PWMDC-DC converters, power management in portable and battery-powered products such as computers, printers, battery charger, telecommunication power system, and telephones power system.

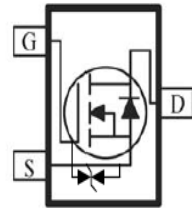
PACKAGE INFORMATION

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			



ABSOLUTE MAXIMUM RATINGS (T_A=25°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°C	3.5	A
	I _D @ T _A =70°C	2.8	A
Pulsed Drain Current ²	I _{DM}	16	A
Continuous Source Current (Diode Conduction) ¹	I _S	1.25	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 ≤ 10 sec	R _{θJA}	100
	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
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1.0	-	-	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS}=0$, $V_{GS}=20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=24\text{V}$, $V_{GS}=0$
		-	-	25		$V_{DS}=24\text{V}$, $V_{GS}=0$, $T_J=55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	6	-	-	A	$V_{DS}=5\text{V}$, $V_{GS}=10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	58	m Ω	$V_{GS}=10\text{V}$, $I_D=3.5\text{A}$
		-	-	82		$V_{GS}=4.5\text{V}$, $I_D=3\text{A}$
Forward Transconductance ¹	g_{fs}	-	6.9	-	S	$V_{DS}=15\text{V}$, $I_D=3.5\text{A}$
Diode Forward Voltage	V_{SD}	-	0.8	-	V	$I_S=2.3\text{A}$, $V_{GS}=0$
DYNAMIC ²						
Total Gate Charge	Q_g	-	2.2	-	nC	$V_{DS}=15\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=3.5\text{A}$
Gate-Source Charge	Q_{gs}	-	0.5	-		
Gate-Drain Charge	Q_{gd}	-	0.8	-		
Turn-on Delay Time	$T_{d(on)}$	-	16	-	nS	$V_{DD}=25\text{V}$, $V_{GEN}=10\text{V}$, $R_L=25\Omega$, $I_D=1\text{A}$
Rise Time	T_r	-	5	-		
Turn-off Delay Time	$T_{d(off)}$	-	23	-		
Fall Time	T_f	-	3	-		

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

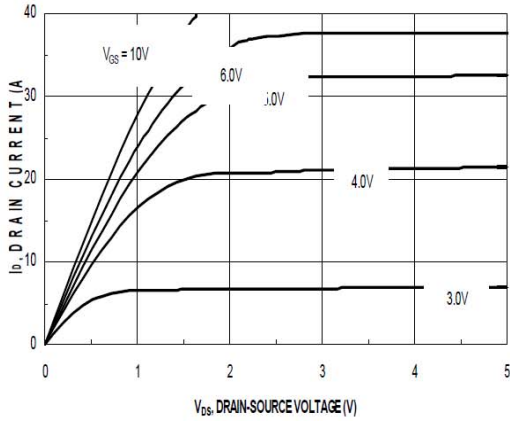


Figure 1. On-Region Characteristics

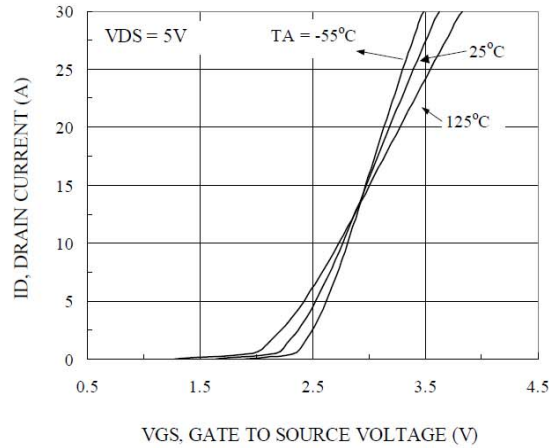


Figure 2. Body Diode Forward Voltage Variation with Source Current and Temperature

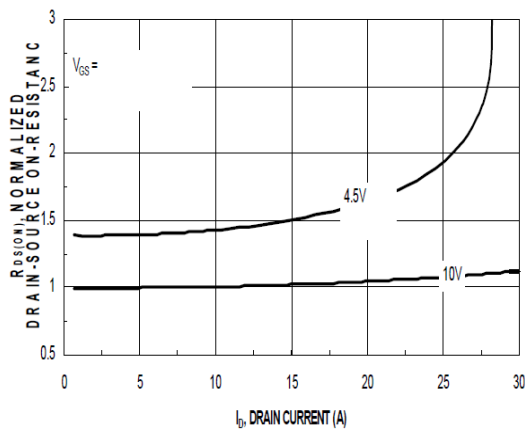


Figure 3. On Resistance Vs Vgs Voltage

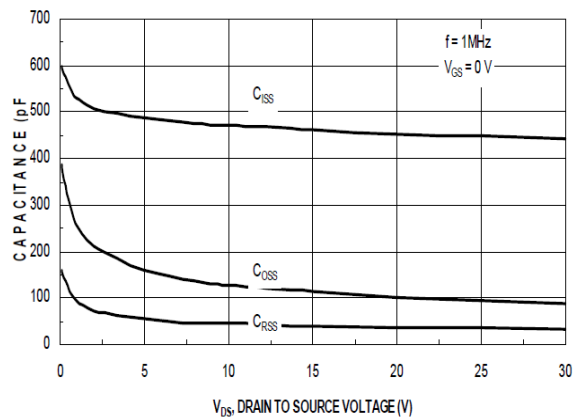


Figure 4. Capacitance Characteristics

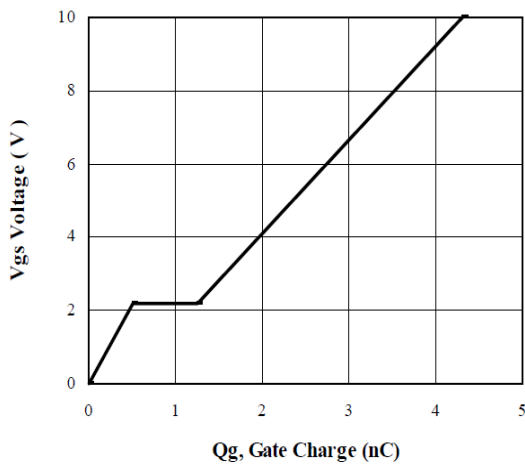


Figure 5. Gate Charge Characteristics

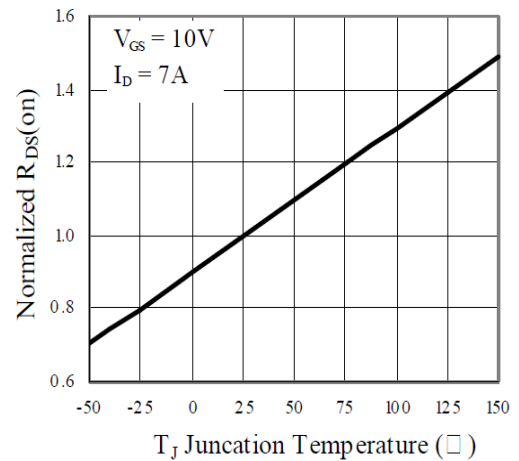


Figure 6. On-Resistance Variation with Temperature

CHARACTERISTIC CURVE

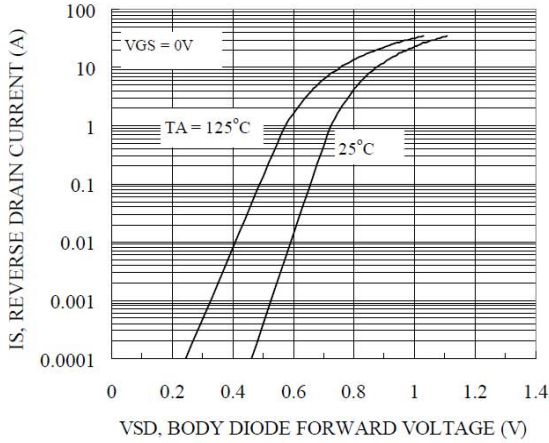


Figure 7. Transfer Characteristics

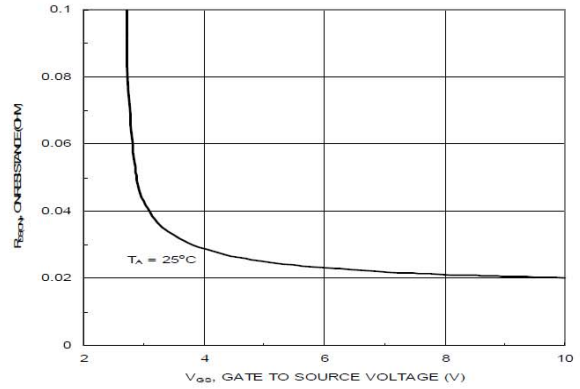


Figure 8. On-Resistance with Gate to Source Voltage

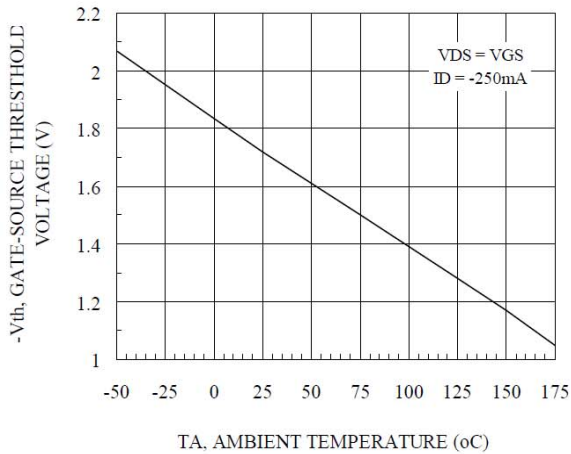


Figure 9. V_{th} Gate to Source Voltage Vs Temperature

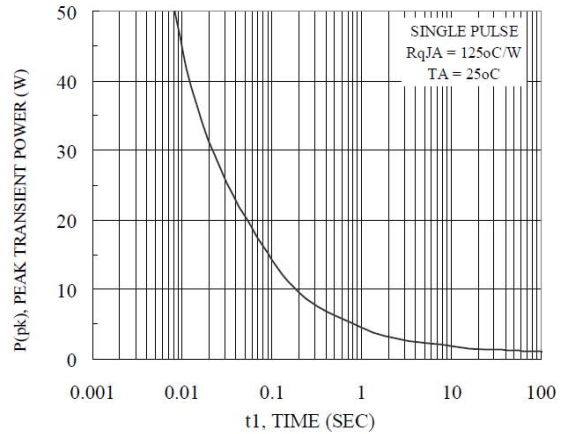


Figure 10. Single Pulse Maximum Power Dissipation

Normalized Thermal Transient Junction to Ambient

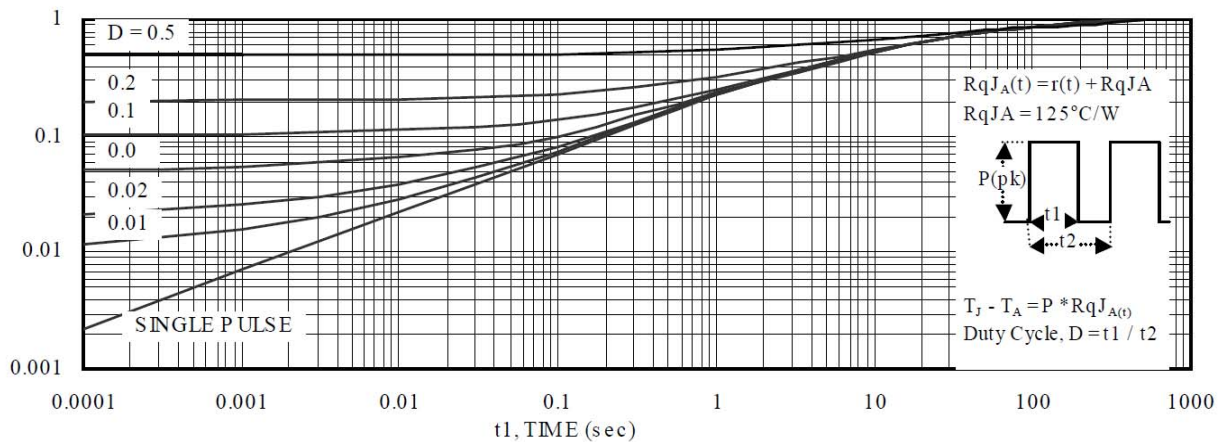


Figure 11. Transient Thermal Response Curve