

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

## DESCRIPTION

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

## FEATURES

- Low  $R_{DS(on)}$  provides higher efficiency and extends battery life.
- Low thermal impedance copper lead frame SC-59 saves board space.
- Fast switching speed.
- High performance trench technology.

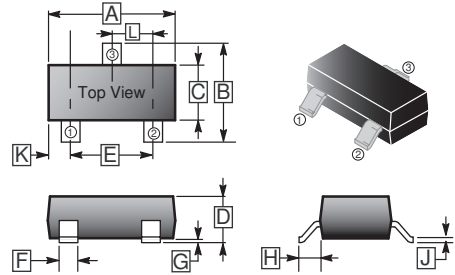
## Application

DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

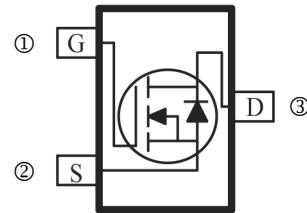
## PACKAGE INFORMATION

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 ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A=25^\circ\text{C}$	0.6
		$T_A=70^\circ\text{C}$	0.4
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	10	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	1.7	A
Power Dissipation <sup>1</sup>	$P_D$	$T_A=25^\circ\text{C}$	1.3
		$T_A=70^\circ\text{C}$	0.8
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ 150	$^\circ\text{C}$
<b>Thermal Resistance Ratings</b>			
Maximum Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	$t \leq 10\text{sec}$	100
		Steady State	166

Notes:

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

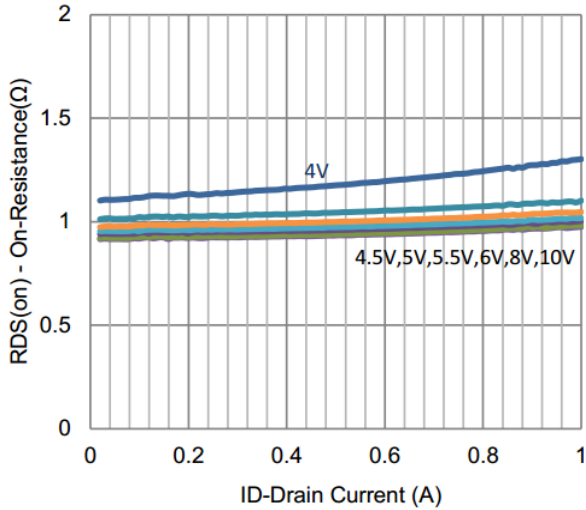
**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-Threshold Voltage	V <sub>GS(th)</sub>	1	-	-	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
Gate-Body Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>DS</sub> =0, V <sub>GS</sub> =±20V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	-	-	1	μA	V <sub>DS</sub> =120V, V <sub>GS</sub> =0
		-	-	25		V <sub>DS</sub> =120V, V <sub>GS</sub> =0, T <sub>J</sub> =55°C
On-State Drain Current <sup>1</sup>	I <sub>D(on)</sub>	1	-	-	A	V <sub>DS</sub> =5V, V <sub>GS</sub> =10V
Drain-Source On-Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	-	-	2.6	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =0.48A
		-	-	2.8		V <sub>GS</sub> =5.5V, I <sub>D</sub> =0.4A
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	-	15	-	S	V <sub>DS</sub> =15V, I <sub>D</sub> =0.48A
Diode Forward Voltage	V <sub>SD</sub>	-	0.81	-	V	I <sub>S</sub> =0.9A, V <sub>GS</sub> =0
<b>Dynamic<sup>2</sup></b>						
Total Gate Charge	Q <sub>g</sub>	-	4	-	nC	V <sub>DS</sub> =75V, V <sub>GS</sub> =5.5V, I <sub>D</sub> =0.48A
Gate-Source Charge	Q <sub>gs</sub>	-	1.1	-		
Gate-Drain Charge	Q <sub>gd</sub>	-	2.2	-		
Input Capacitance	C <sub>iss</sub>	-	169	-	pF	V <sub>DS</sub> =15V, V <sub>GS</sub> =0, f=1MHz
Output Capacitance	C <sub>oss</sub>	-	15	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	12	-		
Turn-on Delay Time	T <sub>d(on)</sub>	-	4	-	nS	V <sub>DD</sub> =75V, V <sub>GEN</sub> =10V, R <sub>L</sub> =156.3Ω, R <sub>GEN</sub> =6Ω I <sub>D</sub> =0.48A
Rise Time	T <sub>r</sub>	-	5	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	16	-		
Fall Time	T <sub>f</sub>	-	8	-		

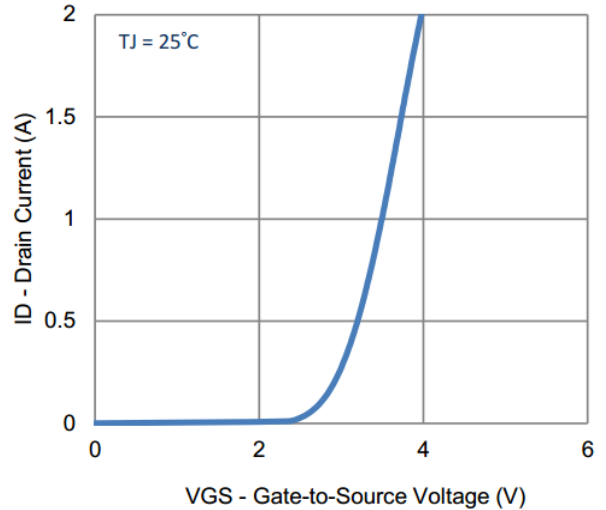
Notes:

- 1 Pulse test : PW ≤ 300 us duty cycle ≤ 2%.
- 2 Guaranteed by design, not subject to production testing.

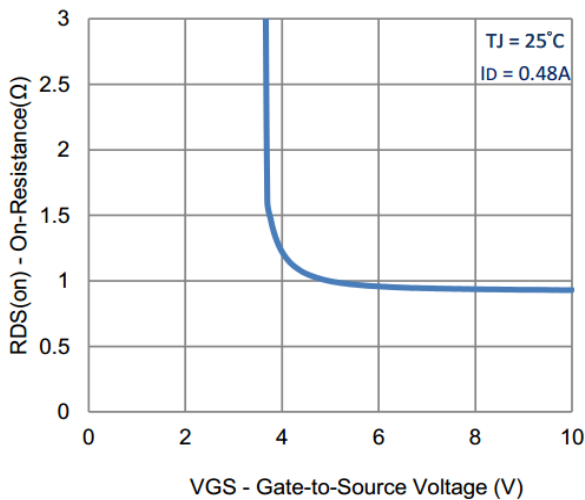
**CHARACTERISTIC CURVE**



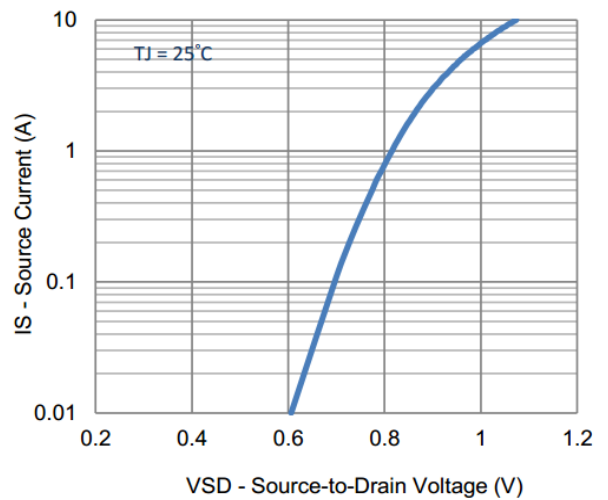
**1. On-Resistance vs. Drain Current**



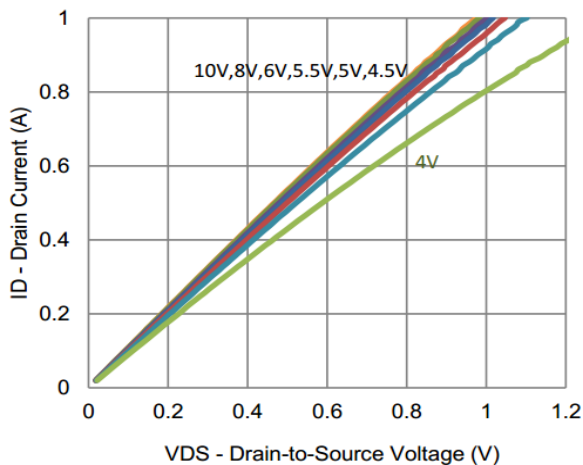
**2. Transfer Characteristics**



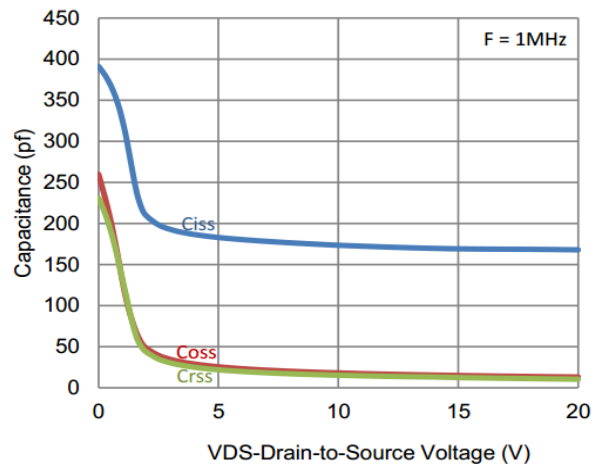
**3. On-Resistance vs. Gate-to-Source Voltage**



**4. Drain-to-Source Forward Voltage**

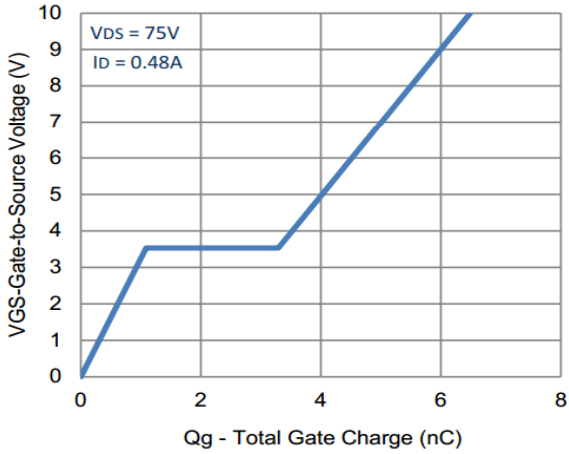


**5. Output Characteristics**

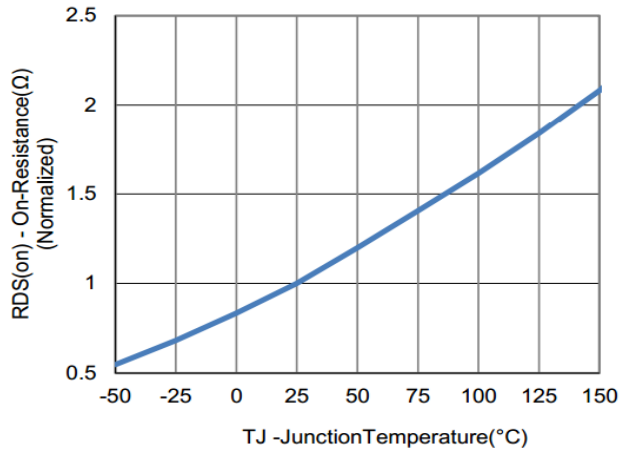


**6. Capacitance**

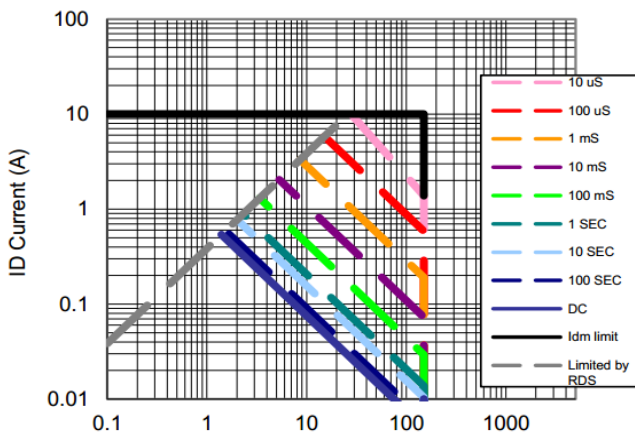
**CHARACTERISTIC CURVE**



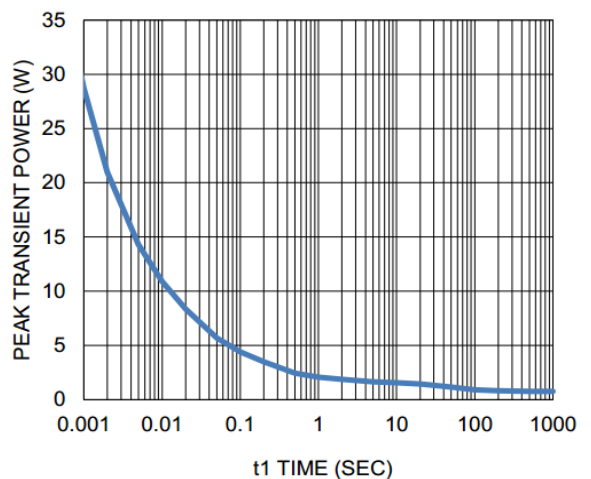
**7. Gate Charge**



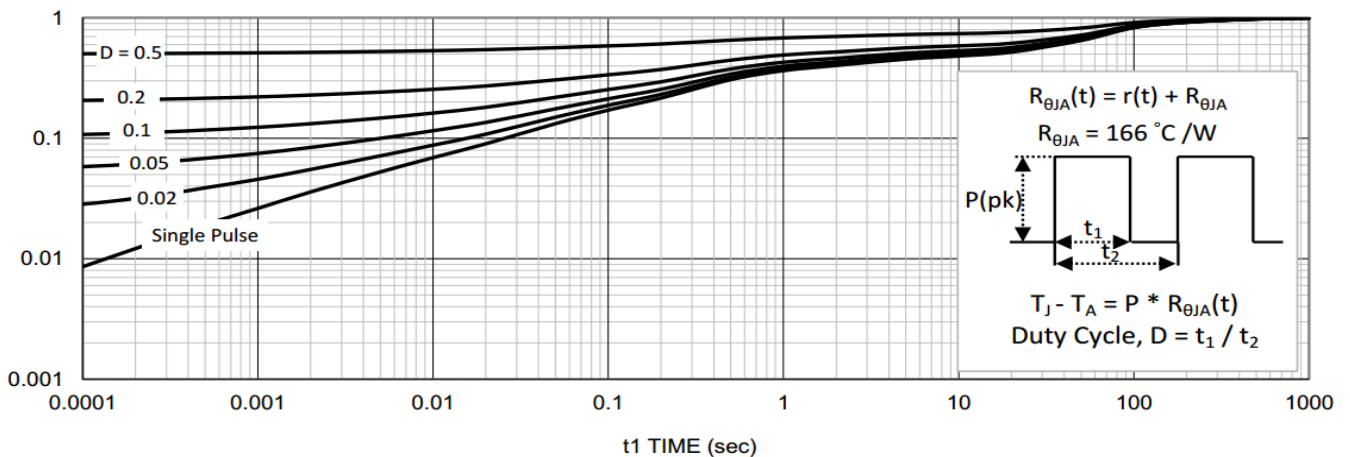
**8. Normalized On-Resistance Vs Junction Temperature**



**9. Safe Operating Area**



**10. Single Pulse Maximum Power Dissipation**



**11. Normalized Thermal Transient Junction to Ambient**