

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

FEATURES

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

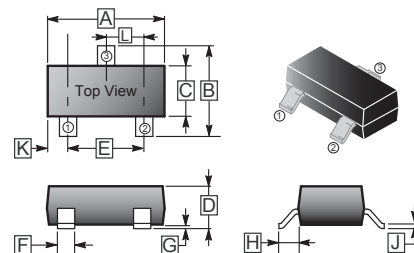
APPLICATION

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

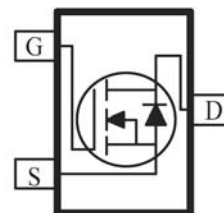
PACKAGE INFORMATION

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 specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹	I_D	$T_A=25^\circ\text{C}$	5.3
		$T_A=70^\circ\text{C}$	4.1
Pulsed Drain Current ²	I_{DM}	30	A
Continuous Source Current (Diode Conduction) ¹	I_S	1.9	A
Power Dissipation ¹	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	$^\circ\text{C}$
Thermal Resistance Rating			
Maximum Junction to Ambient ¹	$R_{\theta JA}$	$t \leq 10$ sec	100
		Steady-State	166

Notes:

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

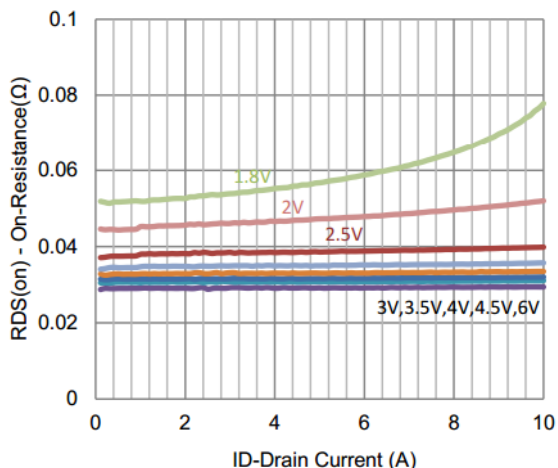
ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	0.4	-	-	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS}=0$, $V_{GS}=\pm 12\text{V}$
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	$I_{D(ON)}$	5	-	-	A	$V_{DS}=5\text{V}$, $V_{GS}=4.5\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	32	m Ω	$V_{GS}=4.5\text{V}$, $I_D=4.1\text{A}$
		-	-	64		$V_{GS}=2.5\text{V}$, $I_D=3.3\text{A}$
Forward Transconductance ¹	g_{FS}	-	8	-	S	$V_{DS}=15\text{V}$, $I_D=4.1\text{A}$
Diode Forward Voltage	V_{SD}	-	0.68	-	V	$I_S=9\text{A}$, $V_{GS}=0$
Dynamic ²						
Total Gate Charge	Q_g	-	8	-	nC	$I_D=4.1\text{A}$ $V_{DS}=15\text{V}$ $V_{GS}=4.5\text{V}$
Gate-Source Charge	Q_{gs}	-	1.1	-		
Gate-Drain Charge	Q_{gd}	-	3.4	-		
Input Capacitance	C_{iss}	-	449	-	pF	$V_{DS}=15\text{V}$, $V_{GS}=0$, $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	70	-		
Reverse Transfer Capacitance	C_{rss}	-	56	-		
Turn-On Delay Time	$T_{d(ON)}$	-	7	-	nS	$I_D=4.1\text{A}$, $V_{DS}=15\text{V}$ $V_{GEN}=4.5\text{V}$ $R_L=3.7\Omega$ $R_{GEN}=6\Omega$
Rise Time	T_r	-	15	-		
Turn-Off Delay Time	$T_{d(OFF)}$	-	37	-		
Fall Time	T_f	-	11	-		

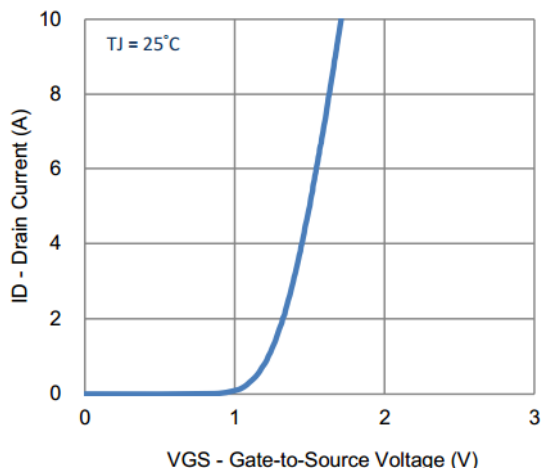
Notes:

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

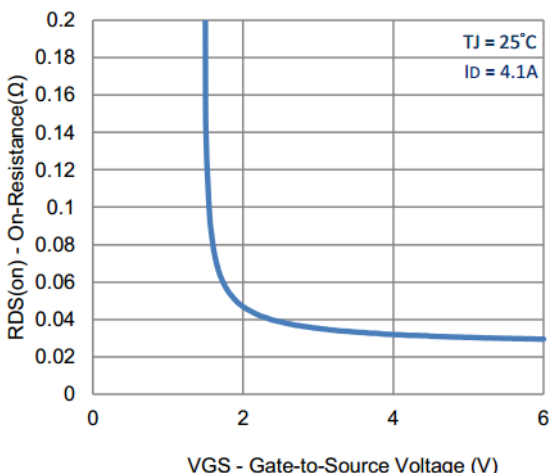
CHARACTERISTIC CURVES



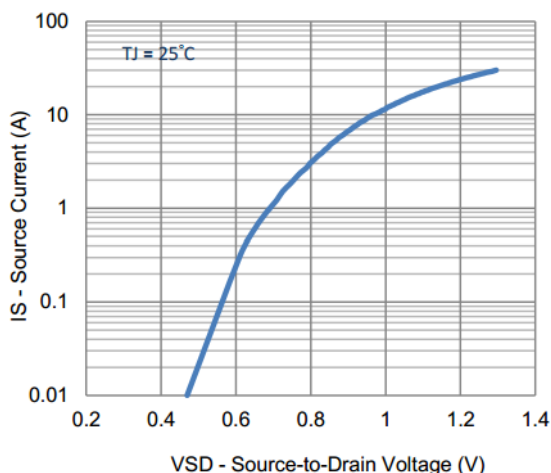
1. On-Resistance vs. Drain Current



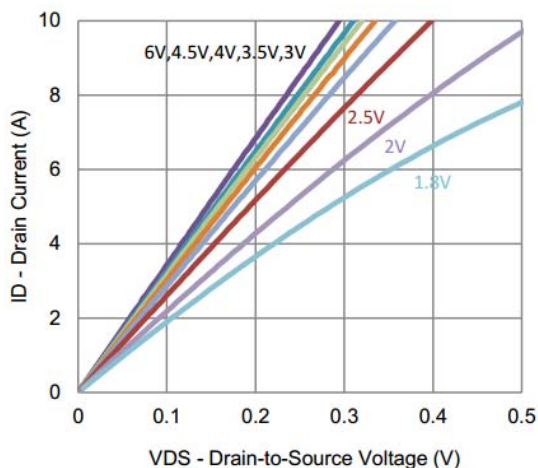
2. Transfer Characteristics



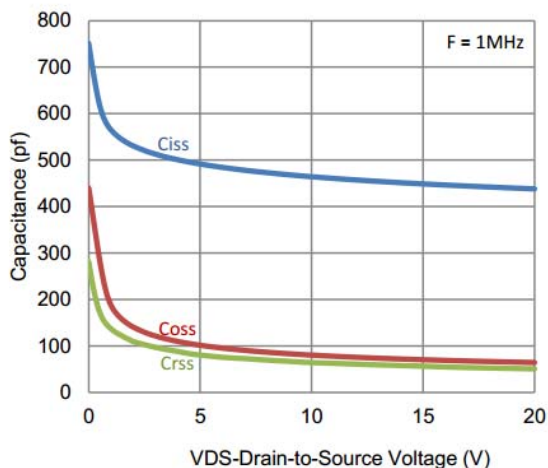
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

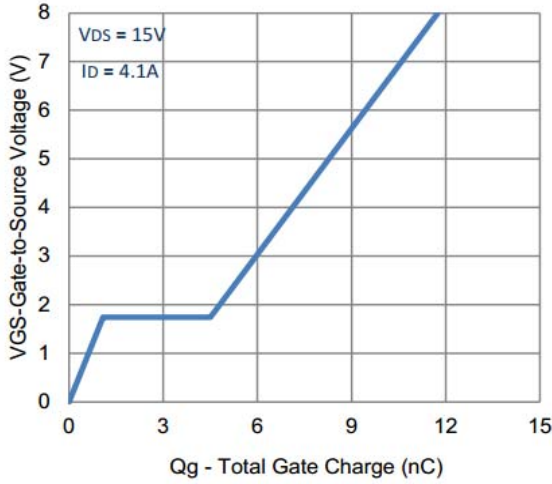


5. Output Characteristics

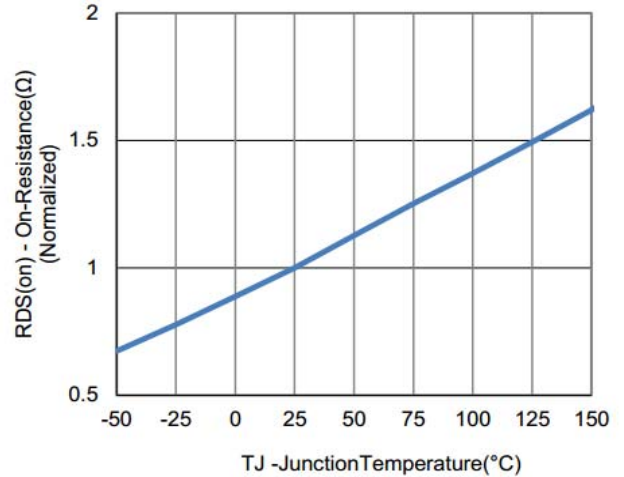


6. Capacitance

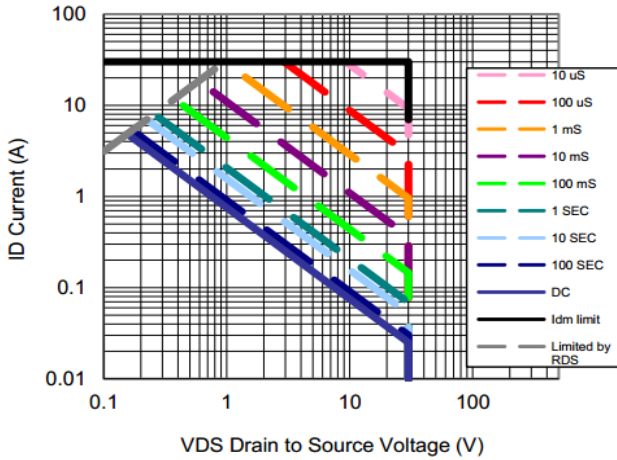
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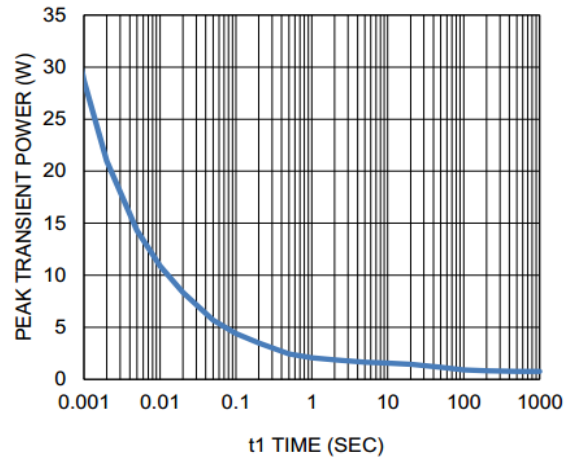
7. Gate Charge



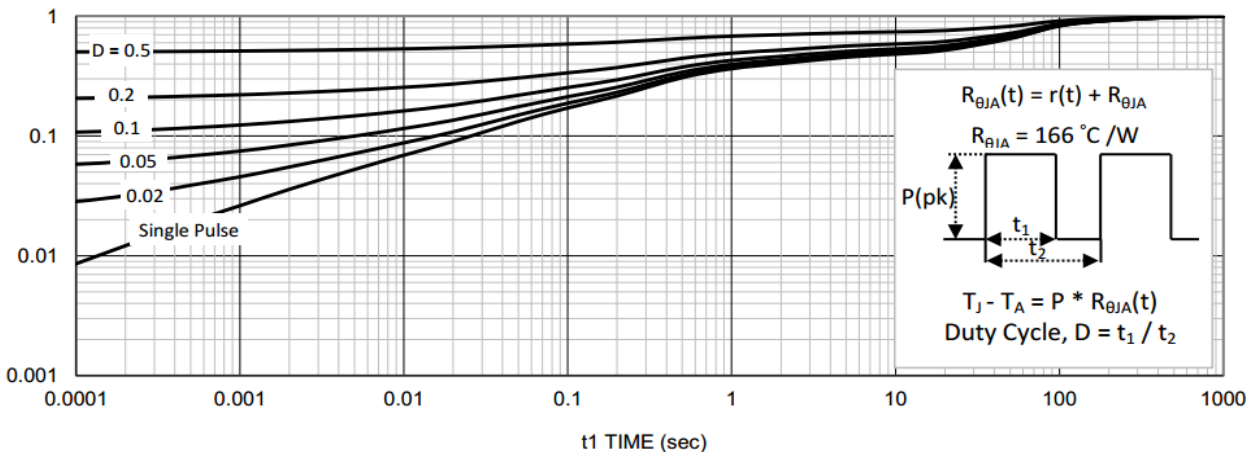
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient