

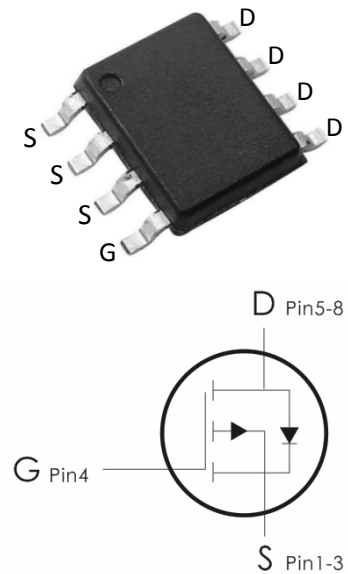
Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-30V, I_D=-12A, R_{DS(ON)}<14m\Omega @V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_A=25^\circ\text{C}$	-12	A
	Continuous Drain Current- $T_A=100^\circ\text{C}$	-7.8	
I_{DM}	Pulsed Drain Current ^{note1}	-48	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	64	mJ
P_D	Power Dissipation	3.3	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	38	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
SC014PG	C014P	SOP-8

Electrical Characteristics: ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0V	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =-250 μ A	-1	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =-10V, I _D =-12A	---	9.3	14	m Ω
		V _{GS} =-4.5V, I _D =-8A	---	14	20	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	2790	---	pF
C _{oss}	Output Capacitance		---	341	---	
C _{rss}	Reverse Transfer Capacitance		---	315	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =-15V, V _{GS} =-10V I _D =-6A, R _{GEN} =2.5 Ω	---	14	---	ns
t _r	Rise Time		---	20	---	ns
t _{d(off)}	Turn-Off Delay Time		---	95	---	ns
t _f	Fall Time		---	65	---	ns
Q _g	Total Gate Charge	V _{DS} =-15V , V _{GS} =-10V , I _D =-12A	---	30	---	nC
Q _{gs}	Gate-Source Charge		---	5.3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	7.6	---	nC
Drain-Source Diode Characteristics						
I _S	Source-Drain Diode Forward Current		---	---	-12	A
I _{SM}	Pulsed Drain Diode Forward Current		---	---	-48	A

V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-12A$	---	-0.8	-1.2	V
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Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^{\circ}C$, $V_{DD}=-15V$, $V_G=-10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=-16A$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Characteristics: ($T_C=25^{\circ}C$ unless otherwise noted)

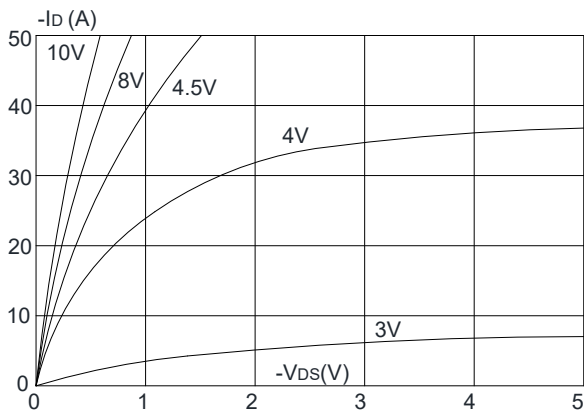


Figure 1: Output Characteristics

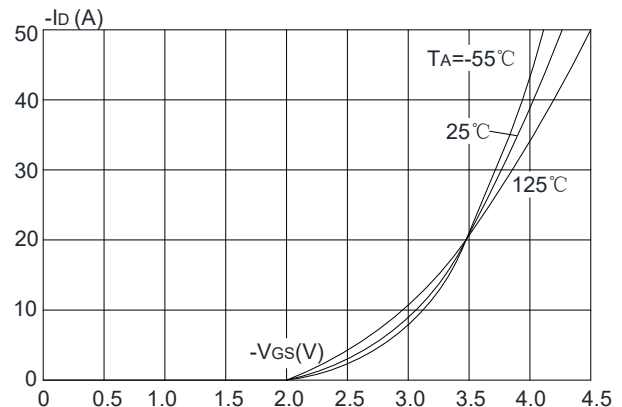


Figure 2: Typical Transfer Characteristics

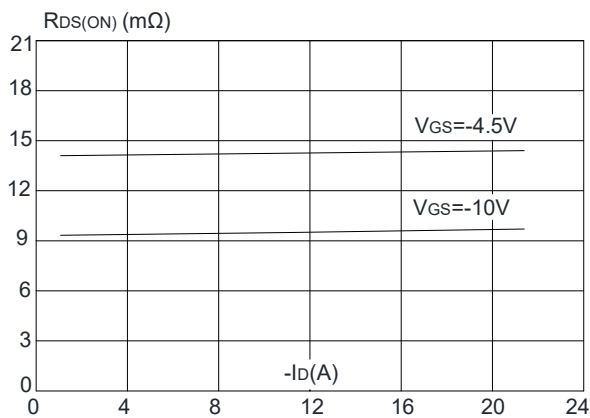


Figure 3: On-resistance vs. Drain Current

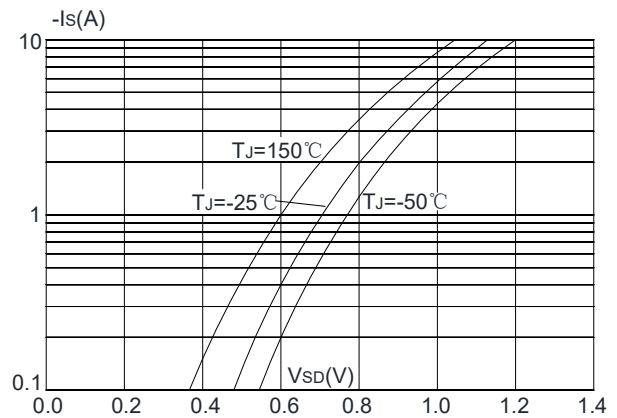


Figure 4: Body Diode Characteristics

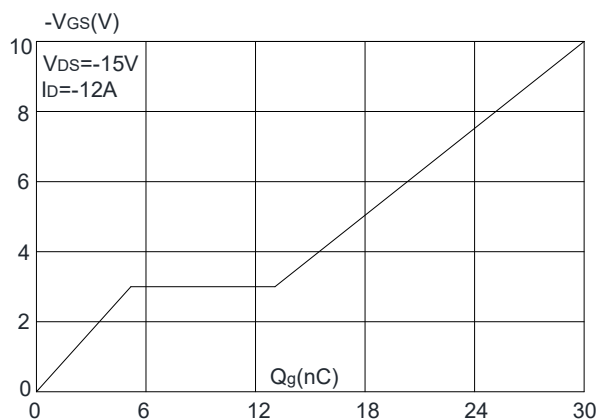


Figure 5: Gate Charge Characteristics

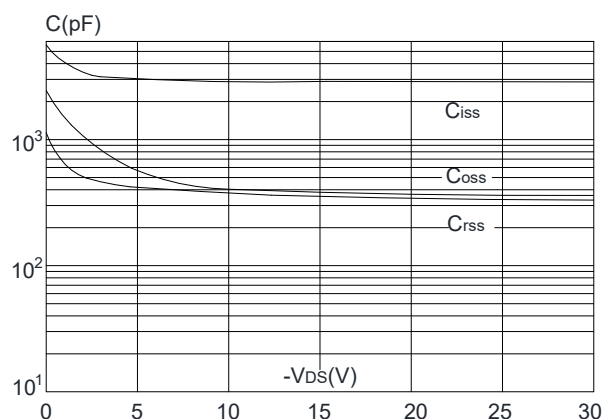


Figure 6: Capacitance Characteristics

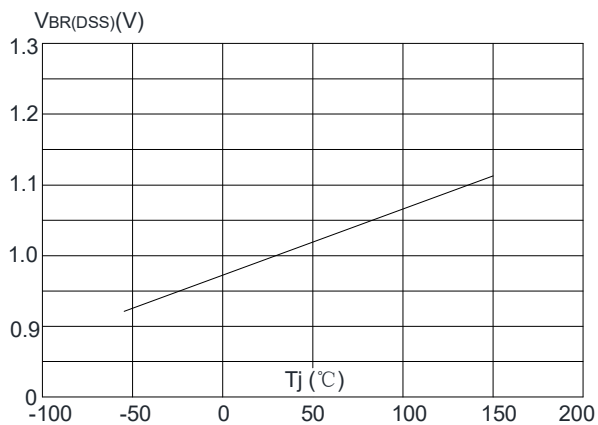


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

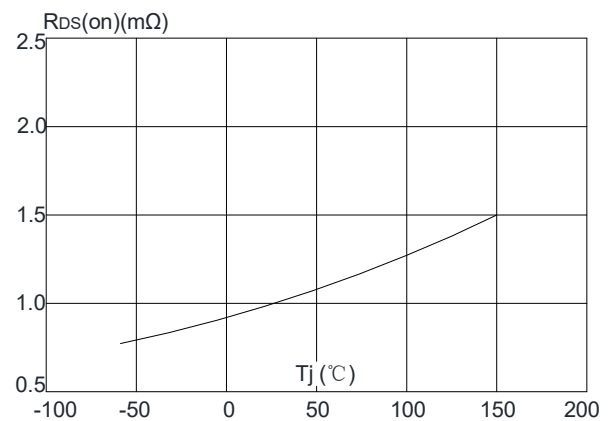


Figure 8: Normalized on Resistance vs. Junction Temperature

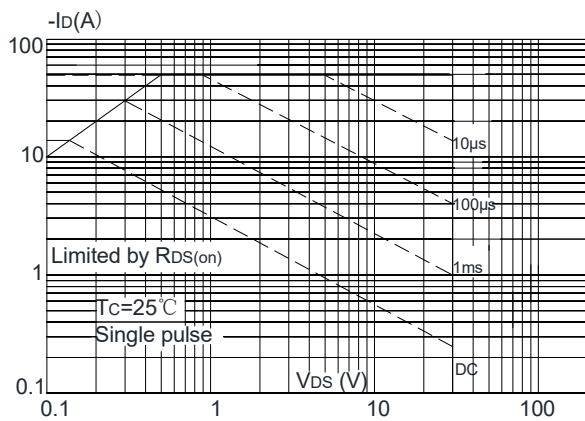


Figure 9: Maximum Safe Operating Area

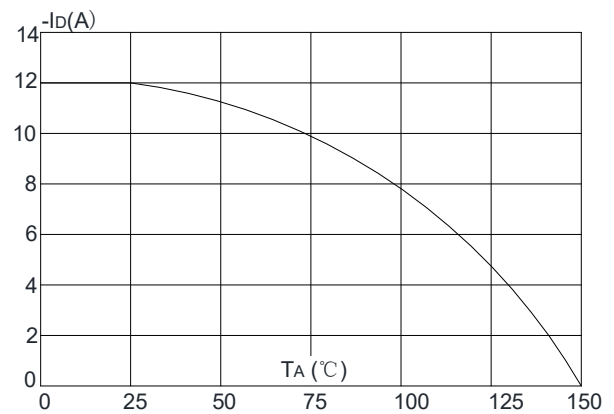


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

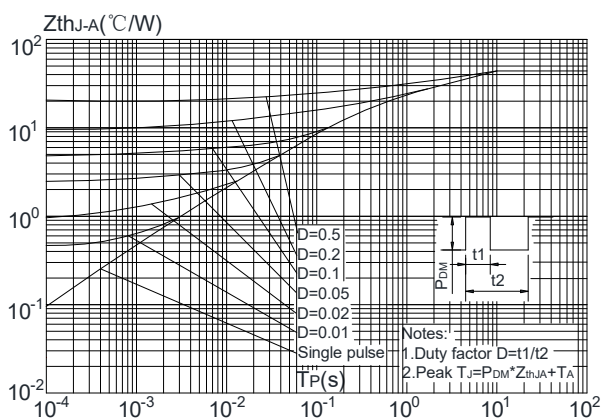


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient