

Description:

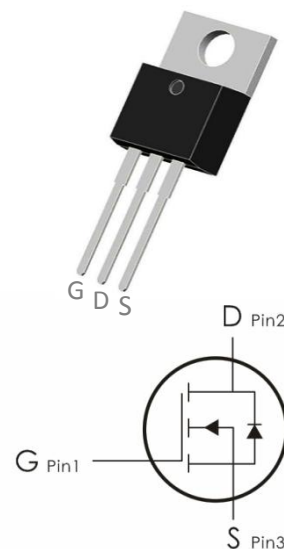
This N-Channel MOSFET uses advanced trench technology and

design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=30V, I_D=180A, R_{DS(on)} < 2.4m\Omega @ V_{GS}=10V$
- 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: ($T_C=25^\circ C$ unless otherwise note)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	180	A
	Continuous Drain Current- $T_C=100^\circ C$	117	
I_{DM}	Pulsed Drain Current ¹	720	A
E_{AS}	Single Pulse Avalanche Energy ²	324	mJ
P_D	Power Dissipation- $T_J=25^\circ C$	130	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.15	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
PC2R4NG	C2R4N	TO-220

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ 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
		V _{GS} =0V, V _{DS} =480V, T _C =125 °C	---	---	100	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.5	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =30A	---	1.95	2.4	mΩ
		V _{GS} =4.5V, I _D =20A	---	3.5	5	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	4929	---	pF
C _{oss}	Output Capacitance		---	681	---	
C _{rss}	Reverse Transfer Capacitance		---	564	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =15V, I _D =30A, R _G =3 Ω	---	9	---	ns
t _r	Rise Time		---	6.4	---	ns
t _{d(off)}	Turn-Off Delay Time		---	74	---	ns
t _f	Fall Time		---	16	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =30A	---	69	---	nC
Q _{gs}	Gate-Source Charge		---	9	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	14	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _D =30A	---	---	1.2	V

I_S	Continuous Source Current	V _G =V _D =0V	---	---	180	A
I_{SM}	Pulsed Source Current	V _G =V _D =0V	---	---	720	A
T_{rr}	Reverse Recovery Time	I _S =20A, V _{GS} =0V	---	30	---	ns
Q_{rr}	Reverse Recovery Charge	diF/dt=100A/μs (Note3)	---	15	---	μC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=36A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics: (T_C=25°C unless otherwise noted)

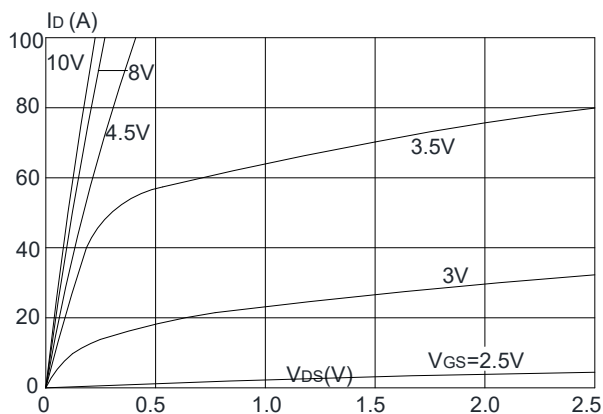


Figure 1: Output Characteristics

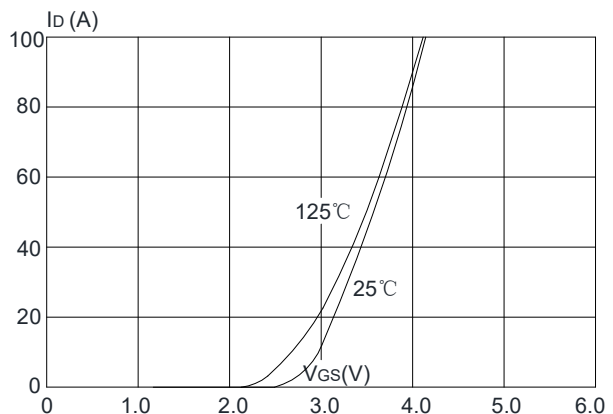


Figure 2: Typical Transfer Characteristics

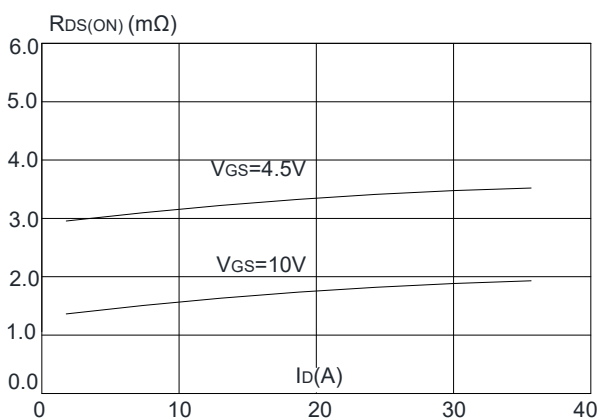


Figure 3: On-resistance vs. Drain Current

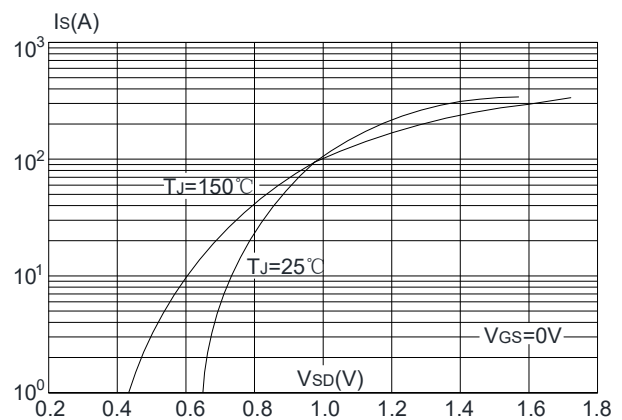
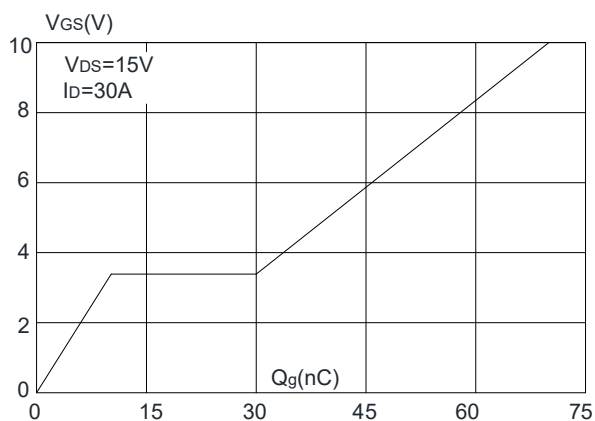
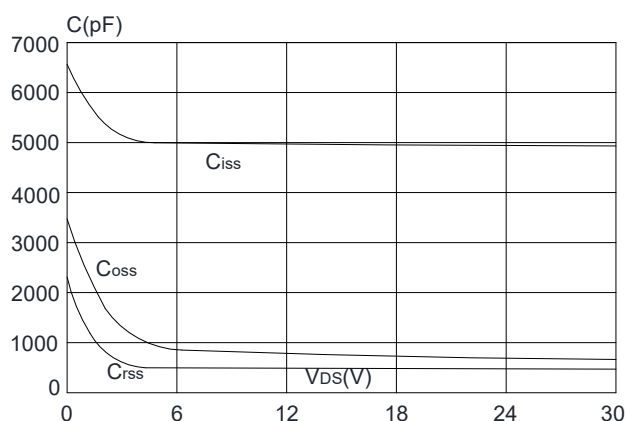
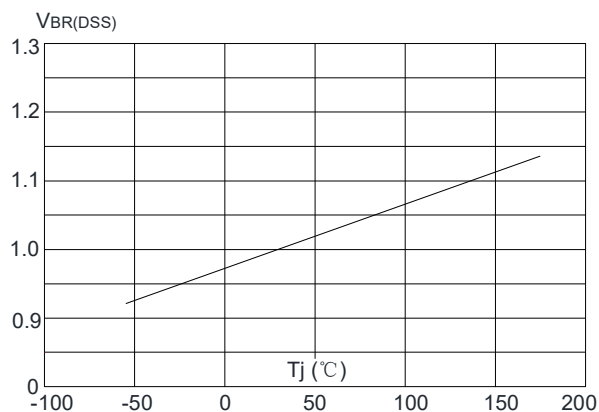
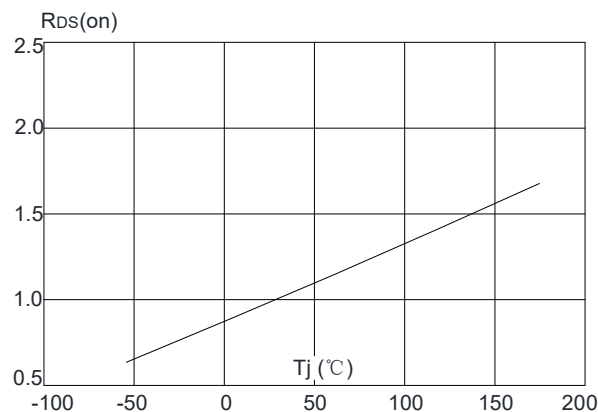
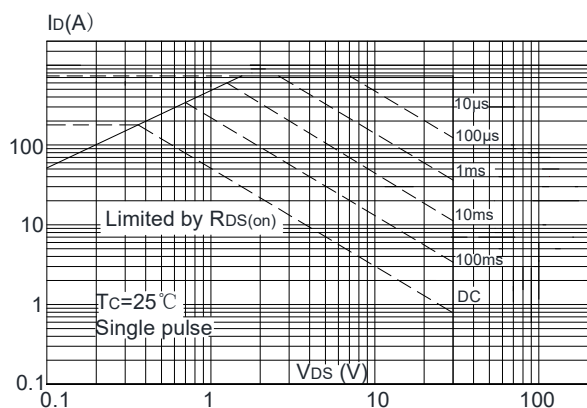
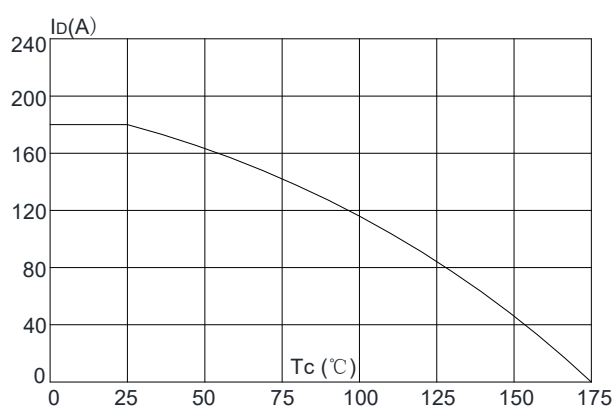


Figure 4: Body Diode Characteristics


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

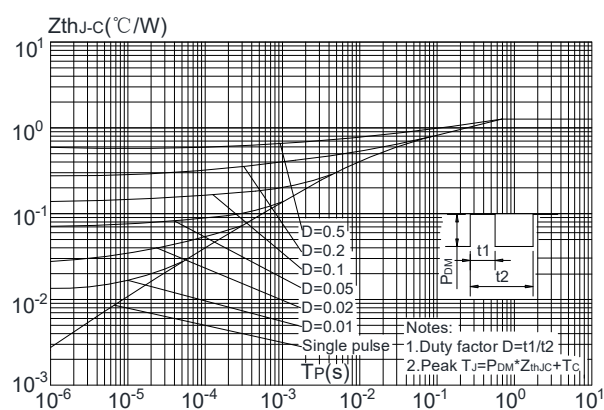


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case