CMP65R580Q/CMF65R580Q

650V N-Channel Super Junction Power MOSFET

General Description

The 65R580Q use advanced super junction technology and design to provide excellent RDS(ON) with low gate charge. This advanced technology has been tailored to minimize conduction loss, provide superior switching performance, and withstand extreme dv/dt rate and higher avalanche energy. suitable for various AC/DC power conversion in switching mode operation for higher efficiency.

Product Summary

BVDSS	RDSON	ID
650V	580mΩ	8A

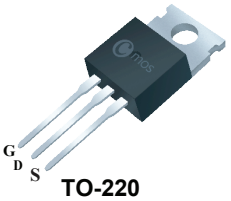
Applications

- Switching applications
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply（UPS）

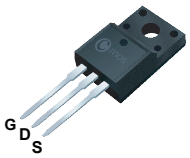
Features

- Ultra Low Gate Charge cause lower driving requirements
- Low on-resistance and low conduction losses
- 100% Avalanche Tested
- RoHS Compliant

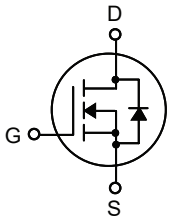
TO-220/220F Pin Configuration



TO-220
(CMP65R580Q)



TO-220F
(CMF65R580Q)



Absolute Maximum Ratings (Tc=25℃ unless otherwise noted)

Symbol	Parameter	220	220F	Units
V_{DSS}	Drain-Source Voltage	650		V
I_D	Drain Current - Continuous (T_C = 25℃)	8	8*	A
	Drain Current - Continuous (T_C = 100℃)	5.2	5.2*	A
I_{DM}	Drain Current - Pulsed [1]	24	24*	A
V_{GSS}	Gate-Source Voltage	±30		V
E_{AS}	Single Pulsed Avalanche Energy [2]	120		mJ
dv/dt	Peak Diode Recovery dv/dt	15		V/ns
P_D	Power Dissipation (T_C = 25℃)	70	30	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150		℃
T_L	Maximum lead temperature for soldering purposes, 1/8 from case for 5 seconds	300		℃

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	220	220F	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.8	3.95	℃/W
$R_{\theta CS}$	Thermal Resistance, Case-to-Sink Typ.	0.5	---	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	80	℃/W

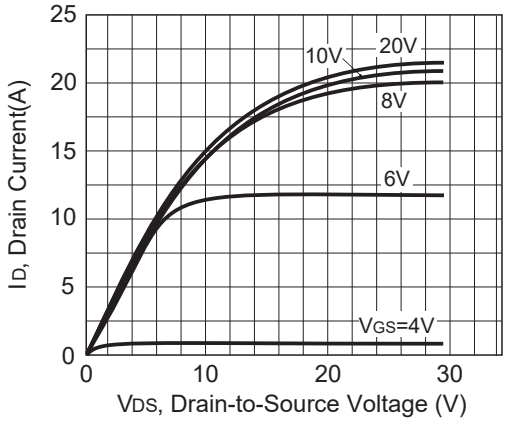
Electrical Characteristic (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 uA	650	--	--	V
BV_{DSS} / T_J	Breakdown Voltage Temperature Coefficient	I_D = 250uA , Referenced to 25℃	--	0.6	--	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	--	--	1	uA
		V_{DS} = 520 V, T_C=125℃	--	--	10	
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	3	--	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 2.5A	--	0.5	0.58	Ω
gfs	Forward Transconductance	V_{DS}=15V , I_D=2A	--	4.5	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	500	--	pF
C_{oss}	Output Capacitance		--	40	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 380V , I_D = 4A R_G = 4.7Ω , V_{GS} = 10 V	--	8	--	ns
t_r	Turn-On Rise Time		--	6	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	60	--	ns
t_f	Turn-Off Fall Time		--	10	--	ns
Q_g	Total Gate Charge	V_{DS} = 480 V, I_D = 8A V_{GS} = 10 V	--	18	--	nC
Q_{gs}	Gate-Source Charge		--	5	--	nC
Q_{gd}	Gate-Drain Charge		--	6.5	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	8	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	24	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 8A	--	--	1.4	V
t_{rr}	Reverse Recovery Time	T_j = 25℃ , I_F = 4A dI_F / dt = 100 A/us	--	230	--	ns
Q_{rr}	Reverse Recovery Charge		--	1.2	--	uC

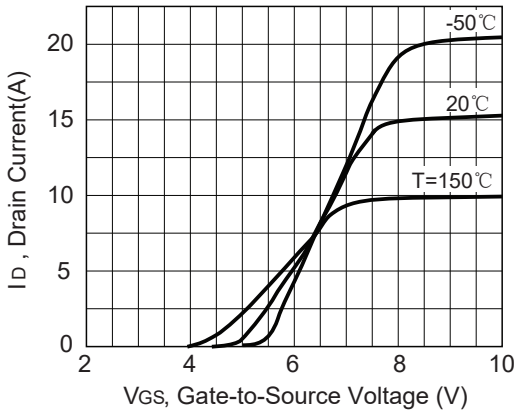
note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. L=15mH, I_{AS}=4A , V_{DD}=50V, R_G=25 Ω,Starting T_J=25 ℃.

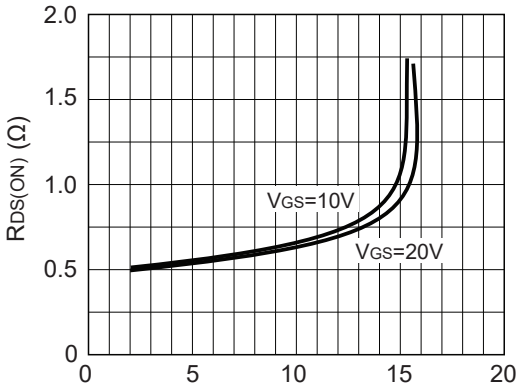
Typical Characteristics



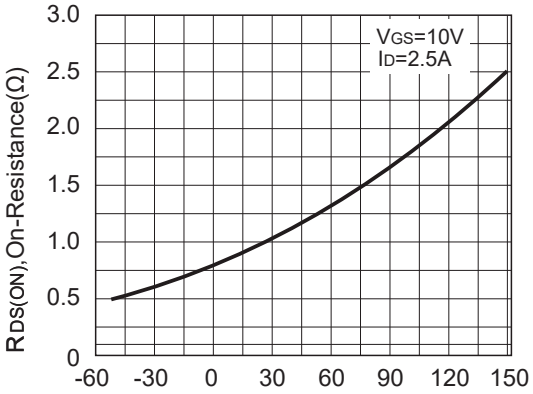
Output Characteristics



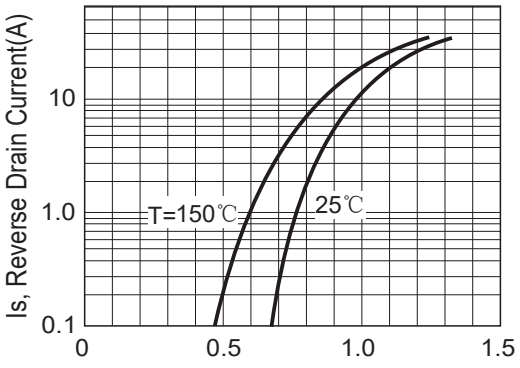
Transfer Characteristics



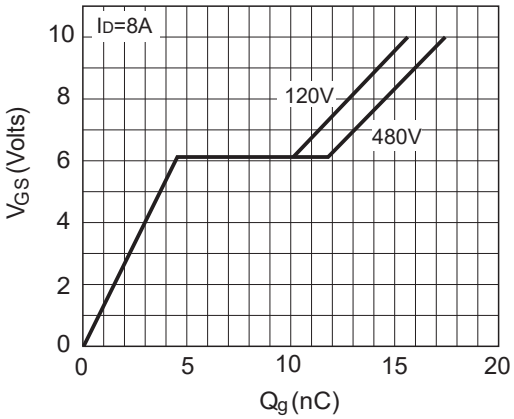
On-Resistance Variation with Drain Current and Gate Voltage



On-Resistance Variation with Temprature

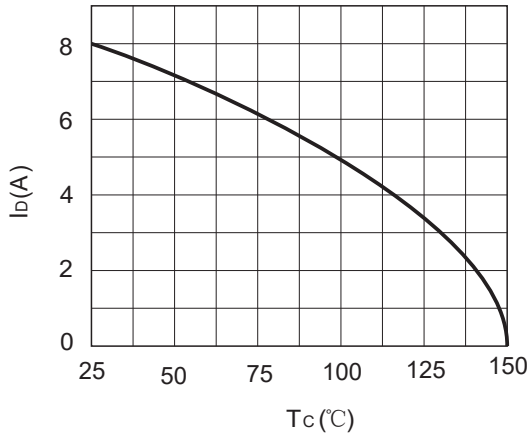


Forward Characteristic of Reverse Diode

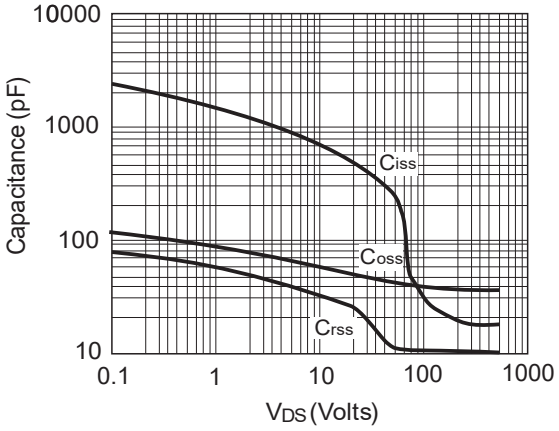


Gate-Charge Characteristics

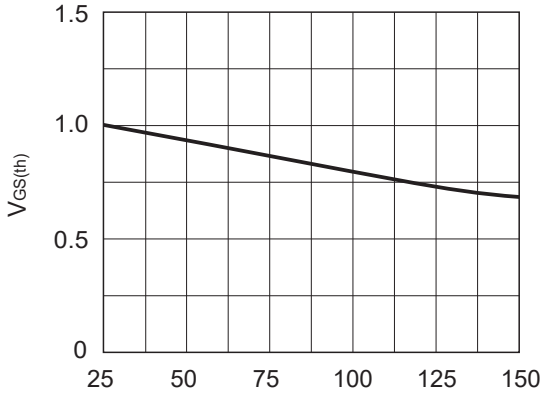
Typical Characteristics



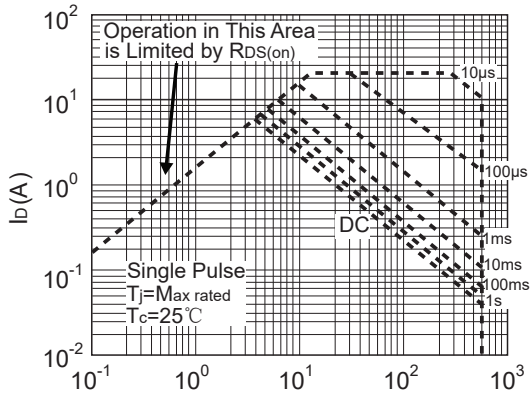
Maximum Drain Current vs. Case Temperature



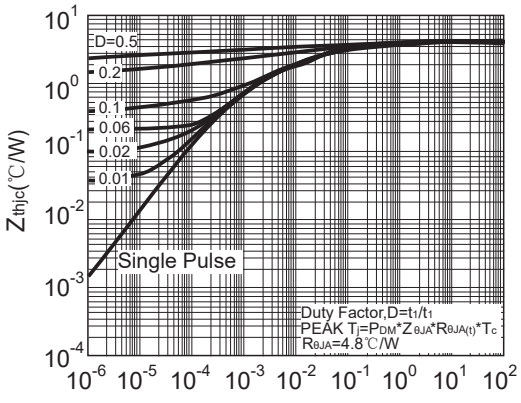
Capacitance Characteristics



$V_{GS(th)}$ Variation with Temprature



Maximum Safe Operating Area



Transient Thermal Response Curve