CMP10N65A/CMF10N65A

650V N-Channel MOSFET

General Description

The 10N65A uses advanced planar stripe DMOS technology to provide excellent $R_{DS(ON)}$ and superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies,active power factor correction based on half bridge topology.

Product Summary

BVDSS	RDSON	ID
650V	1Ω	10A

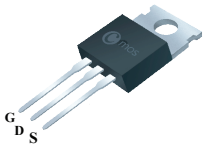
Applications

- Charger
- Adaptor
- Power Supply

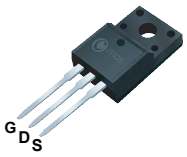
Features

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS Compliant

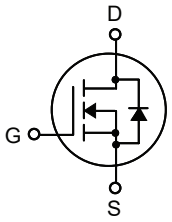
TO-220/220F Pin Configuration



TO-220
(CMP10N65A)



TO-220F
(CMF10N65A)



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℃)	10	10*	A
	Drain Current - Continuous (T_C = 100℃)	6	6*	A
I_{DM}	Drain Current - Pulsed [1]	40	40*	A
V_{GSS}	Gate-Source Voltage	±30		V
E_{AS}	Single Pulsed Avalanche Energy [2]	300		mJ
dv/dt	Peak Diode Recovery dv/dt	4.5		V/ns
P_D	Power Dissipation (T_C = 25℃)	230	50	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	0.8	2.62	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient [3]	62.5	62.5	℃/W

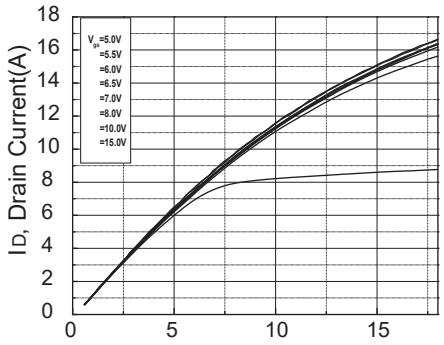
Electrical Characteristic (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250μA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	--	--	1	μA
		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 = 250μA	2	--	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 5A	--	0.84	1	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	1300	--	pF
C_{oss}	Output Capacitance		--	140	--	pF
C_{rss}	Reverse Transfer Capacitance		--	20	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 325 V, I_D = 8A R_G = 25Ω , V_{GS}=10V	--	20	--	ns
t_r	Turn-On Rise Time		--	48	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	100	--	ns
t_f	Turn-Off Fall Time		--	50	--	ns
Q_g	Total Gate Charge	V_{DS} = 520 V, I_D = 10A V_{GS} = 10 V	--	34	--	nC
Q_{gs}	Gate-Source Charge		--	6	--	nC
Q_{gd}	Gate-Drain Charge		--	15	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	10	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	40	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 10A	--	0.86	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0 V, I_S = 8A dI_F / dt = 100 A/μs	--	330	--	ns
Q_{rr}	Reverse Recovery Charge		--	5.9	--	μC

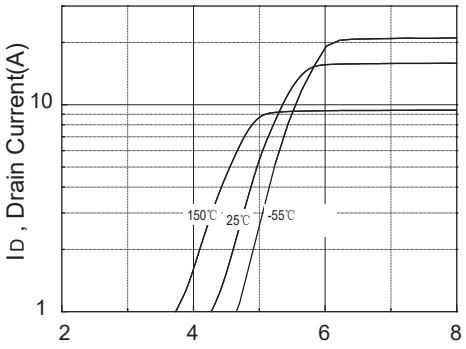
note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. The EAS data shows Max. rating .The test condition is V_{DS}=80V , V_{GS}=10V , L=6mH , I_{AS}=10A.
3. Pulse width is based on $R_{\theta JC}$ & $R_{\theta JA}$ and the maximum allowed junction temperature of 150℃.

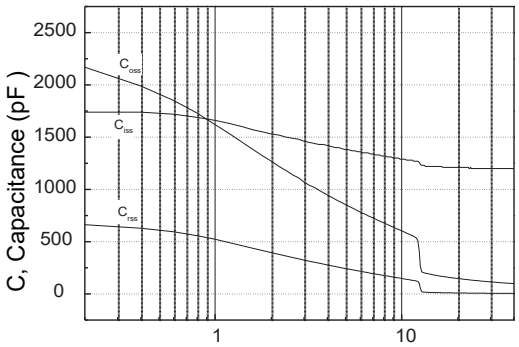
Typical Characteristics



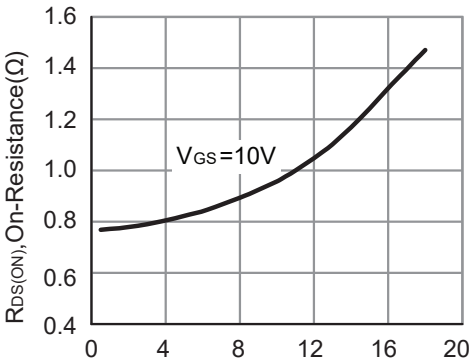
Output Characteristics



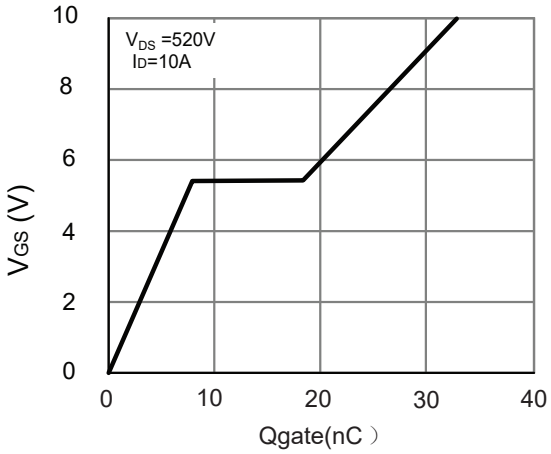
Transfer Characteristics



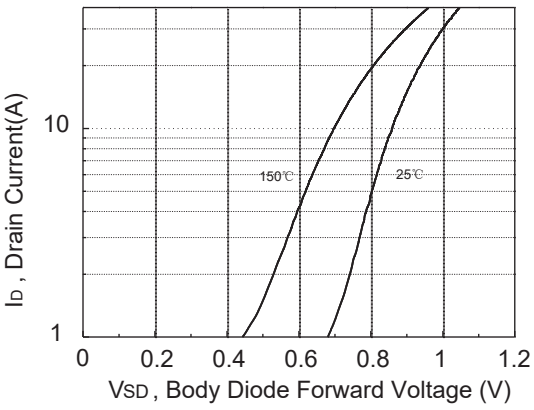
Capacitance Characteristics



On-Resistance vs. Drain Current



Gate charge vs gate-source voltage



Forward Characteristic of Reverse Diode