

General Description

65R190 is power MOSFET using CMOS's advanced super junction technology that can realize very low on-resistance and gate charge. It will provide much high efficiency by using optimized charge coupling technology. These user friendly devices give an advantage of Low EMI to designers as well as low switching loss.

Features

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

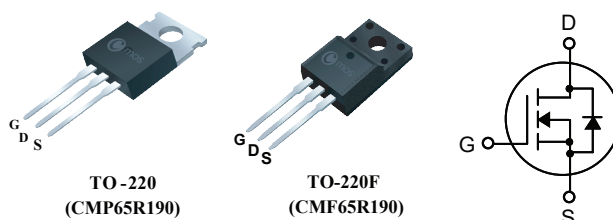
Product Summary

BVDSS	R _{DS(on)} max.	ID
650V	0.19Ω	20A

Applications

- Charger
- Adaptor
- Power Supply

TO-220/220F Pin Configuration



Absolute Maximum Ratings (T_c=25°C unless otherwise noted)

Symbol	Parameter	220	220F	Units
V _{DSS}	Drain-Source Voltage	650		V
I _D	Drain Current - Continuous (T _C = 25°C) - Continuous (T _C = 100°C)	20	20*	A
		12.6	12.6*	A
I _{DM}	Drain Current - Pulsed	80	80*	A
V _{GSS}	Gate-Source Voltage	±30		V
E _{AS}	Single Pulsed Avalanche Energy ¹	240		mJ
dv/dt	Peak Diode Recovery dv/dt	15		V/ns
P _D	Power Dissipation (T _C = 25°C)	150	35	W
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150		°C
T _L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260		°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	220	220F	Units
R _{θJC}	Thermal Resistance, Junction-to-Case	0.83	3.57	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	75	75	°C/W

Electrical Characteristic (Tc=25°C 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 μA	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 650 V, V _{GS} = 0 V	--	--	1	μA
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 = 250 μA	2	--	4	V
R _{DS(on)}	Static Drain-Source on-Resistance	V _{GS} = 10 V, I _D = 10A	--	0.173	0.19	Ω
g _{fs}	Forward Transconductance	V _{DS} = 15V , I _D = 9A	--	13.8	--	S
R _g	Gate Resistance	V _{DS} = 0V , V _{GS} = 0V , f=1MHz	--	8.4	--	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =100V , V _{GS} = 0 V, f = 1.0 MHz	--	1430	--	pF
C _{oss}	Output Capacitance		--	60	--	pF
C _{rss}	Reverse Transfer Capacitance		--	4.3	--	pF
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} = 300V , I _D = 20A R _G =25Ω , V _{GS} =10V	--	24	--	ns
t _r	Turn-On Rise Time		--	89	--	ns
t _{d(off)}	Turn-Off Delay Time		--	212	--	ns
t _f	Turn-Off Fall Time		--	68	--	ns
Q _g	Total Gate Charge	V _{DS} = 480 V, I _D = 10A V _{GS} = 10 V	--	37	--	nC
Q _{gs}	Gate-Source Charge		--	9	--	nC
Q _{gd}	Gate-Drain Charge		--	13	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	20	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	80	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 20A	--	0.88	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, V _{DD} =100V	--	347	--	ns
Q _{rr}	Reverse Recovery Charge	di _F / dt = 100 A/ μs , I _{SD} = 20A	--	5.3	--	μC

note:

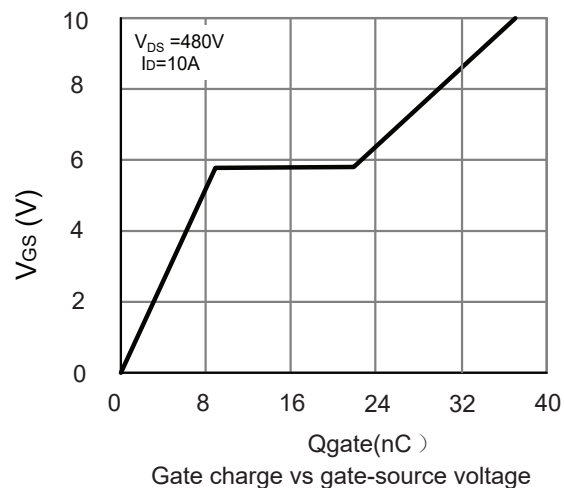
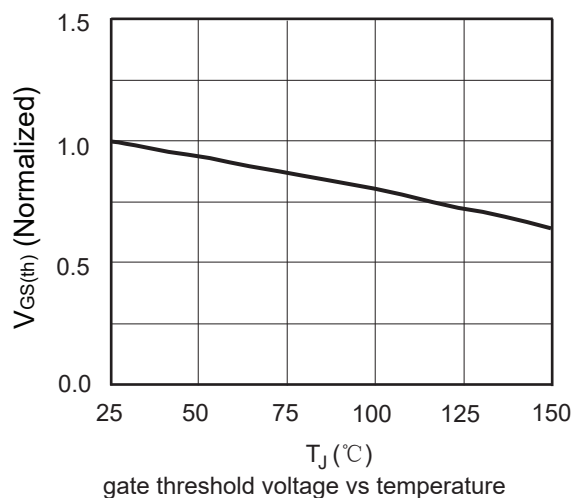
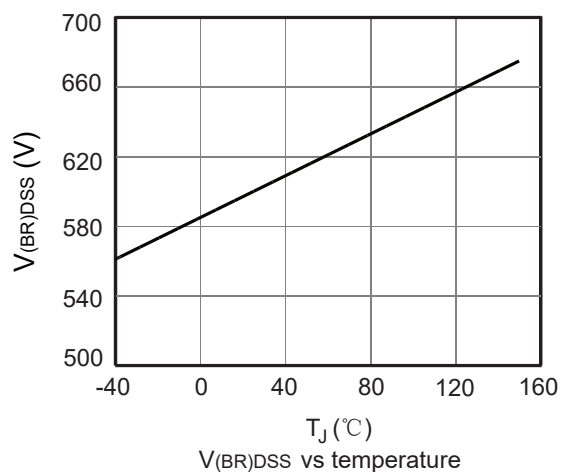
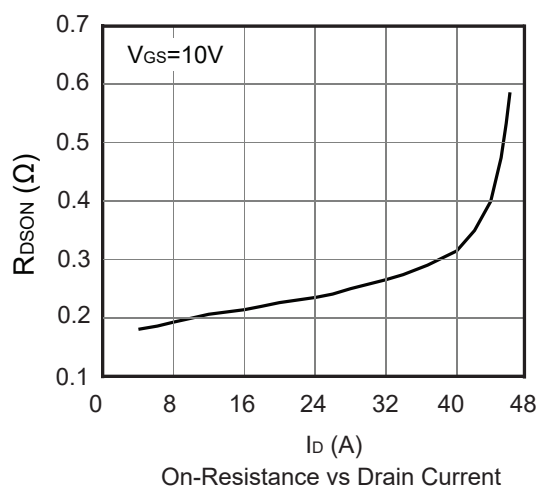
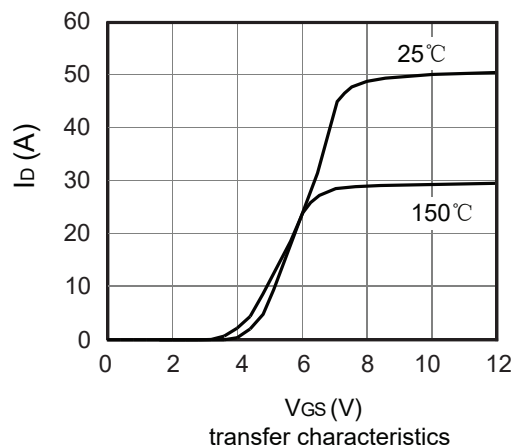
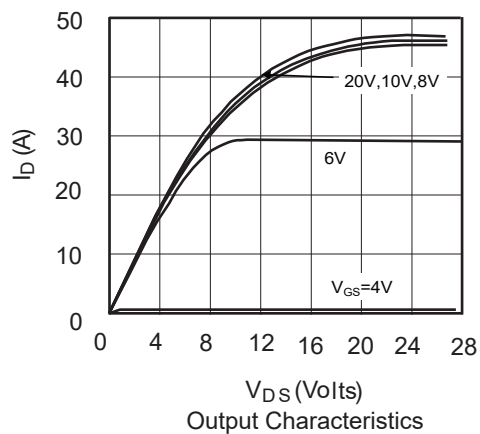
1. The EAS data shows Max. rating .The test condition is $V_{DS}=80\text{ V}, V_{GS}=10\text{ V}, L=30\text{ mH}, I_{AS}=4\text{ A}$.

This product has been designed and qualified for the consumer market.

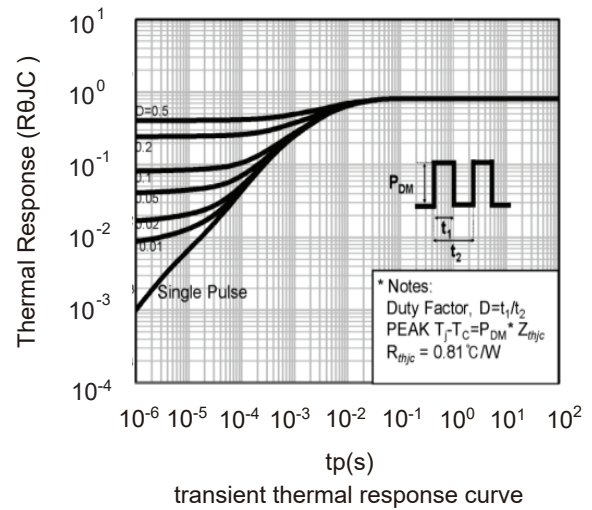
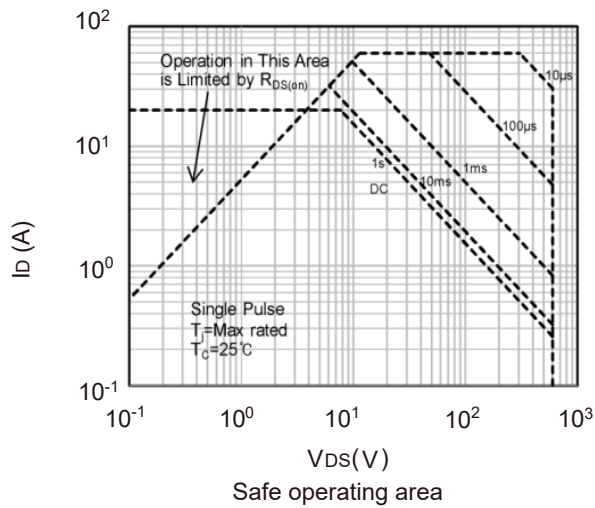
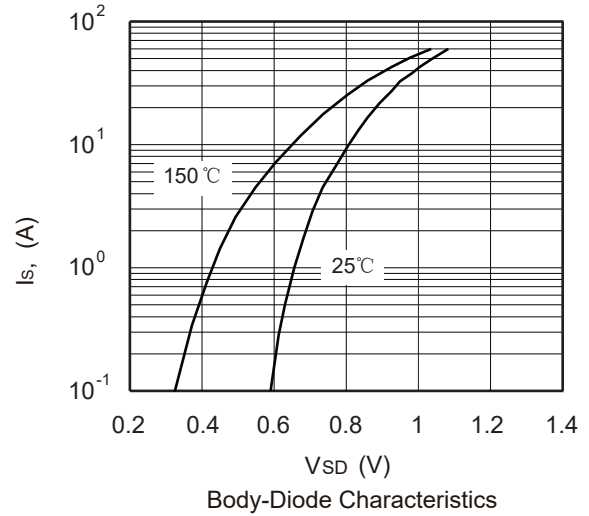
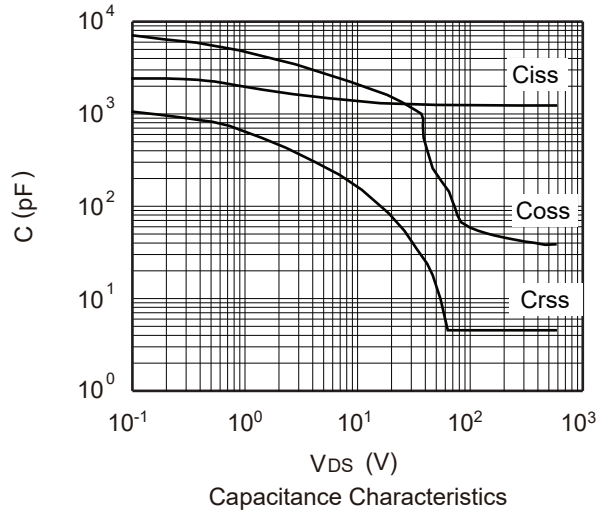
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Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

Typical Characteristics



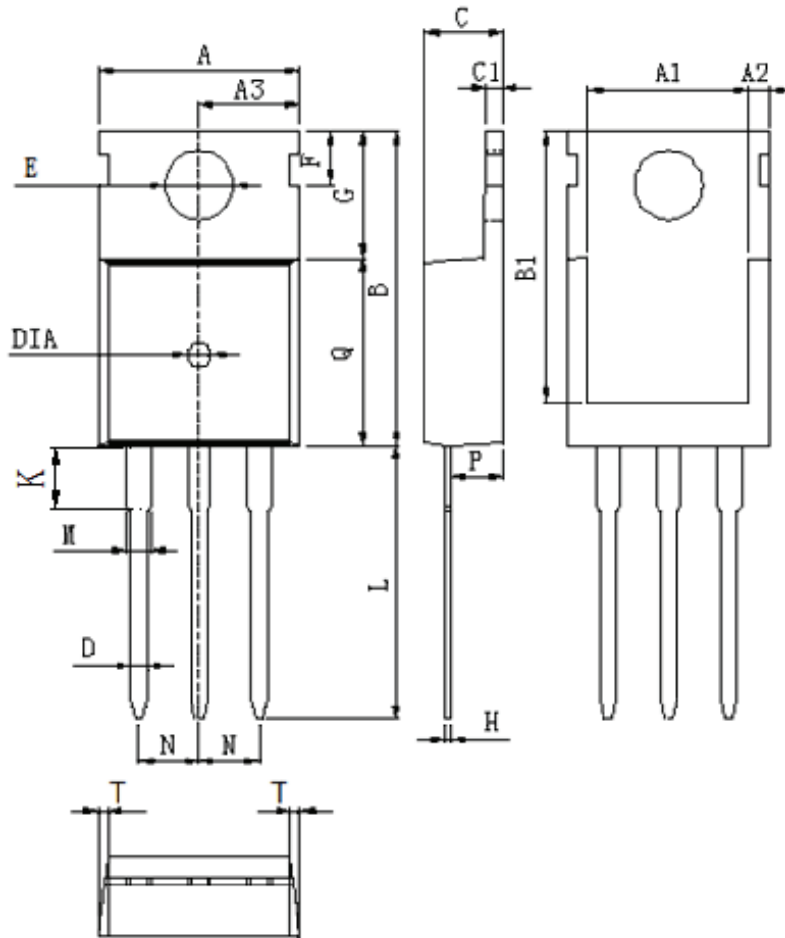
Typical Characteristics



Package Dimension

TO-220

Unit :mm

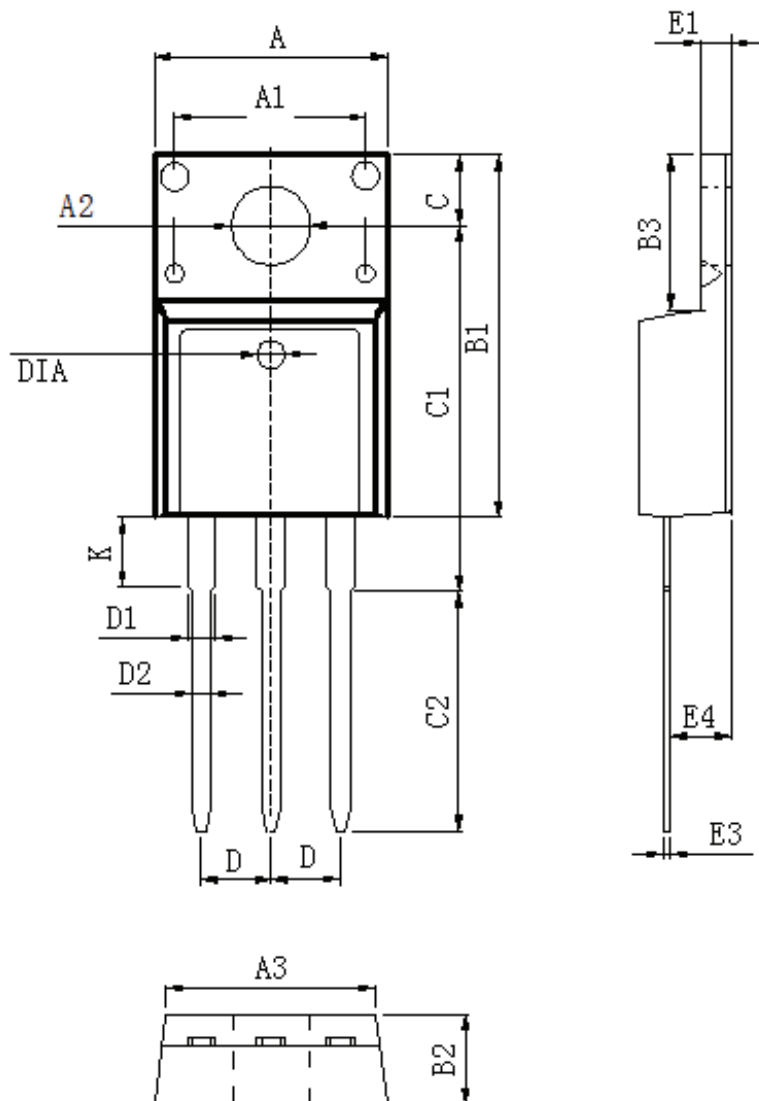


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⌀1.5 (deep 0.2)

Package Dimension

TO-220F

Unit :mm



DIM	MILLIMETERS
A	10.16 ± 0.3
A1	7.00 ± 0.1
A2	3.3 ± 0.2
A3	9.5 ± 0.2
B1	15.87 ± 0.3
B2	4.7 ± 0.2
B3	6.68 ± 0.4
C	3.3 ± 0.2
C1	12.57 ± 0.3
C2	10.02 ± 0.5
D	2.54 ± 0.05
D1	1.28 ± 0.2
D2	0.8 ± 0.1
K	3.1 ± 0.3
E1	2.54 ± 0.1
E3	0.5 ± 0.1
E4	2.76 ± 0.2
DIA	$\odot 1.5$ (deep 0.2)