CMP65R078/CMB65R078/CMI65R078/CMF65R078

650V, 56mΩ typ., 50A N-Channel Super Junction Power MOSFET

General Description

65R078 is power MOSFET using Cmos's advanced super junction technology that can realize very low on-resistance and gate charge. It has low gate charge and ultra-fast body diode, so turn off action is improved. 60R078 provides excellent performances, such as efficiency and EMI, in soft switching applications.

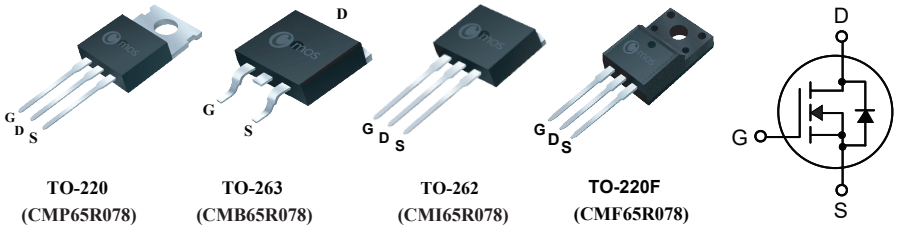
Product Summary

BVDSS	$R_{DS(on)}$ Typ.	ID
650V	70mΩ	50A

Applications

- DC-DC Converters
- Adapter
- PFC Power Supply Stages
- Switching Applications

TO-220/263/262/220F Pin Configuration



Features

- Low On-Resistance
- 100% Avalanche Tested
- RoHS Compliant
- Multi-layer Epitaxial Chip Technology

Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V_{DS}	Drain-Source Voltage	650		V
V_{GS}	Gate-Source Voltage	±30		V
I_D@T_C=25℃	Continuous Drain Current	50	50*	A
I_D@T_C=100℃	Continuous Drain Current	31.6	31.6*	A
I_{DM}	Pulsed Drain Current	200	200*	A
EAS	Single Pulse Avalanche Energy (Note 1)	600		mJ
P_D@T_C=25℃	Total Power Dissipation	250	40	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	150		℃

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	220/263/262	220F	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62.5	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	0.5	3.13	℃/W

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Electrical Characteristics (T_J=25℃ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	650	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=15A	---	56	70	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	3	---	5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=600V , V_{GS}=0V	---	---	13	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=± 30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=15A	---	27	---	S
Q_g	Total Gate Charge	I_D=45A V_{DS} =480V V_{GS} =10V	---	88	---	nC
Q_{gs}	Gate-Source Charge		---	28	---	
Q_{gd}	Gate-Drain Charge		---	35	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =300V V_{GS} =10V I_D=50A R_G=2Ω	---	33	---	ns
T_r	Rise Time		---	160	---	
$T_{d(off)}$	Turn-Off Delay Time		---	76	---	
T_f	Fall Time		---	5	---	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	3600	---	pF
C_{oss}	Output Capacitance		---	150	---	
C_{rss}	Reverse Transfer Capacitance		---	5	---	

Diode Characteristics

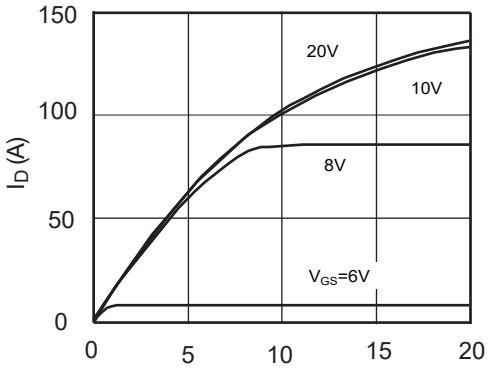
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	50	A
I_{SM}	Pulsed Source Current		---	---	200	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=30A	---	0.88	1.4	V
t_{rr}	Reverse Recovery Time	V_{DD}=100V , I_S=50A dI_F/dt =100A/μs	---	280	---	ns
Q_{rr}	Reverse Recovery Charge		---	2.69	---	μC

Notes:

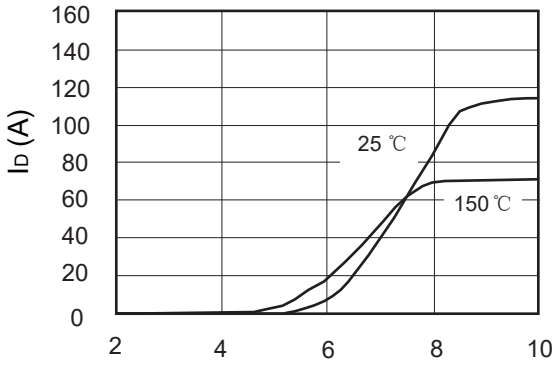
1.The EAS data shows Max. rating . The test condition is V_{DD}=50V , V_{GS}=10V , L=5mH , I_D=15.5A

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Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

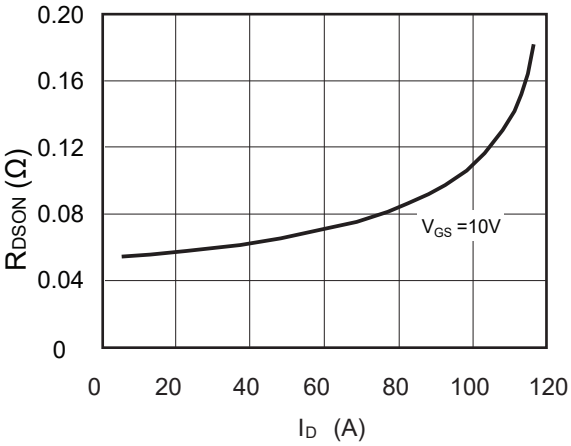
Typical Characteristics



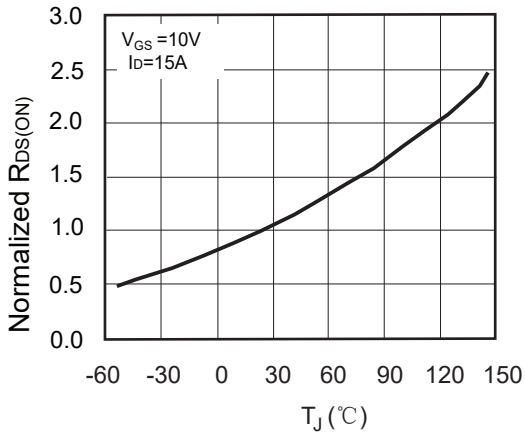
Output Characteristics



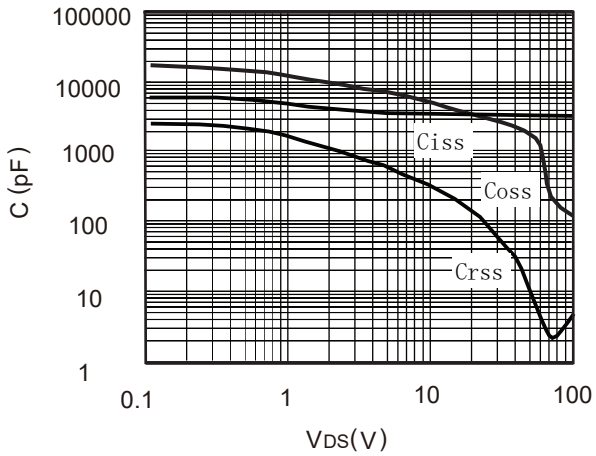
transfer characteristics



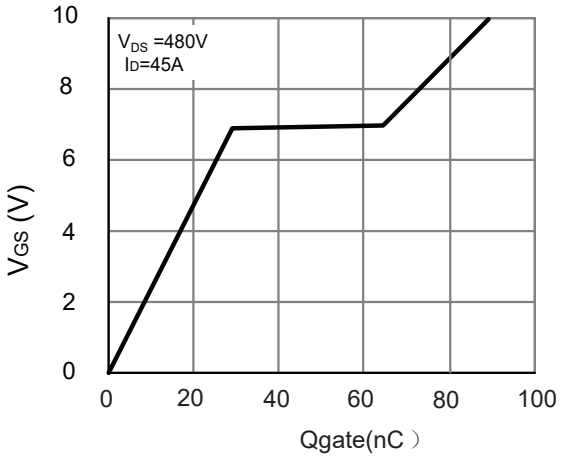
drain-source on-resistance



On-Resistance vs. Junction Temperature

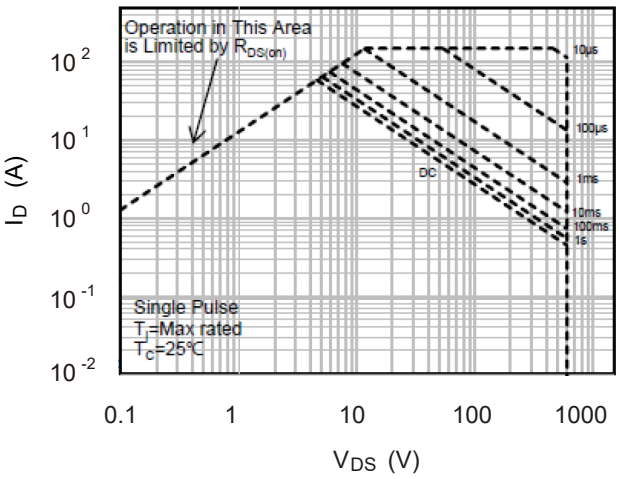


Capacitance Characteristics



Gate charge vs gate-source voltage

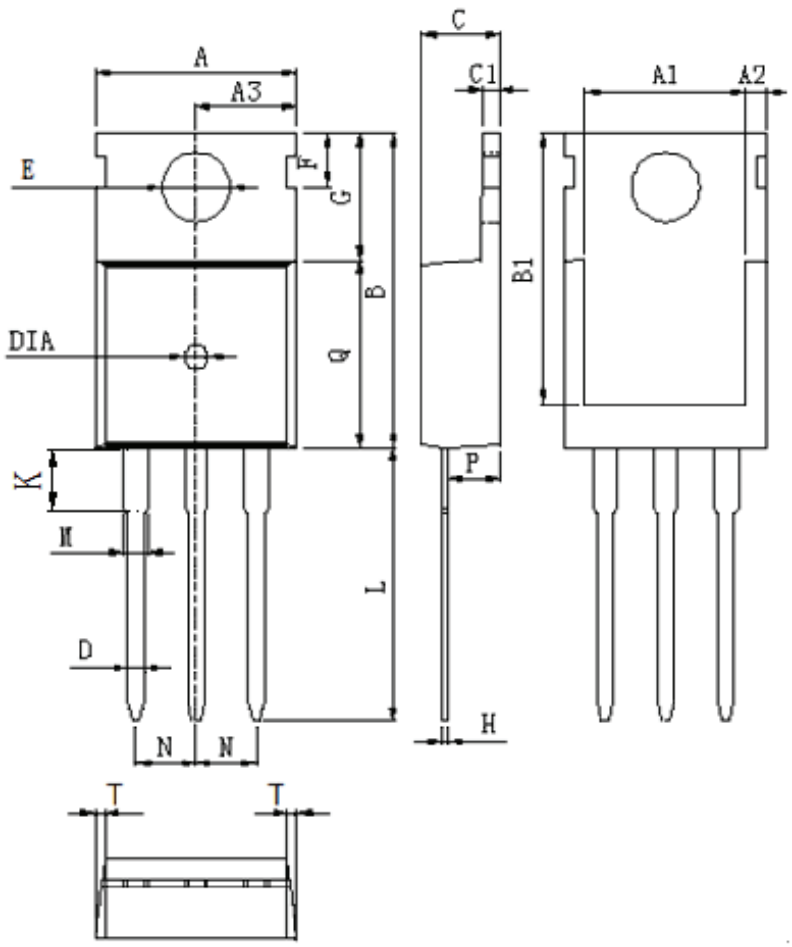
Typical Characteristics



Safe Operating Area

Package Dimension

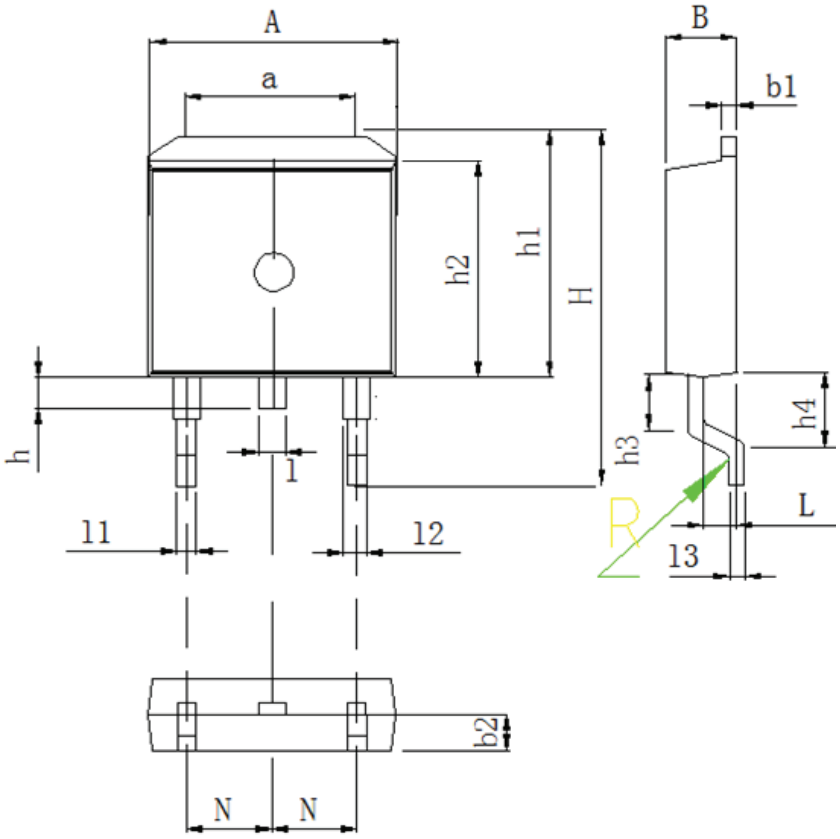
TO-220 Unit :mm



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

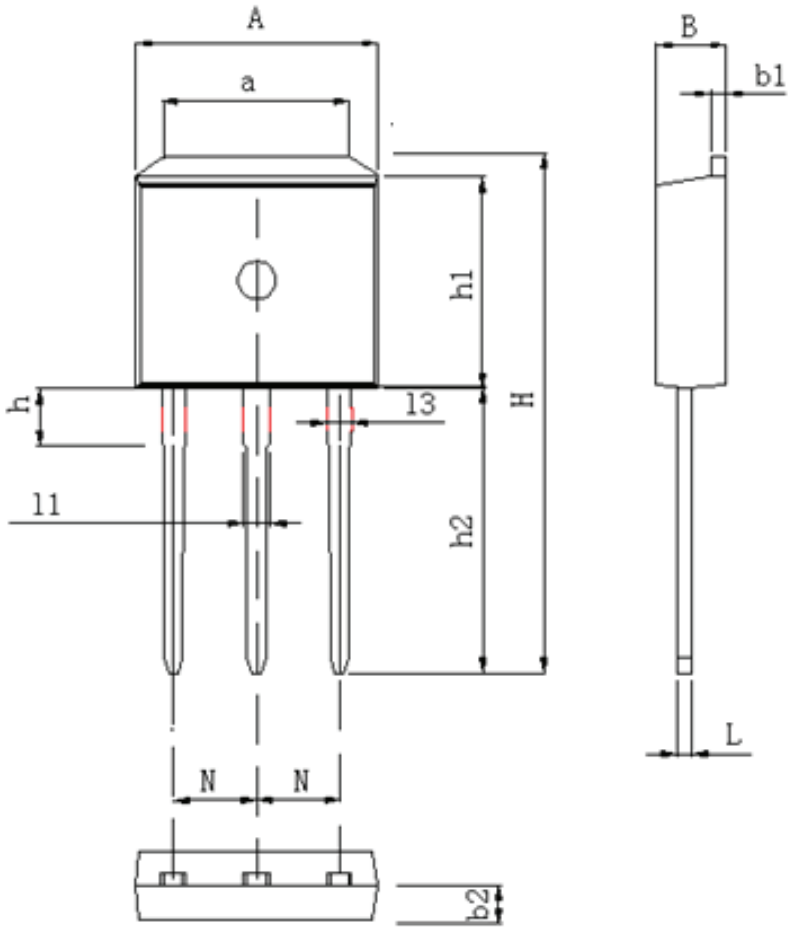
TO-263 Unit :mm



DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
l	1.3±0.1
l1	0.8±0.1
l2	1.3±0.1
l3	0.5±0.1
N	2.54±0.1
R	0.5R±0.05

Package Dimension

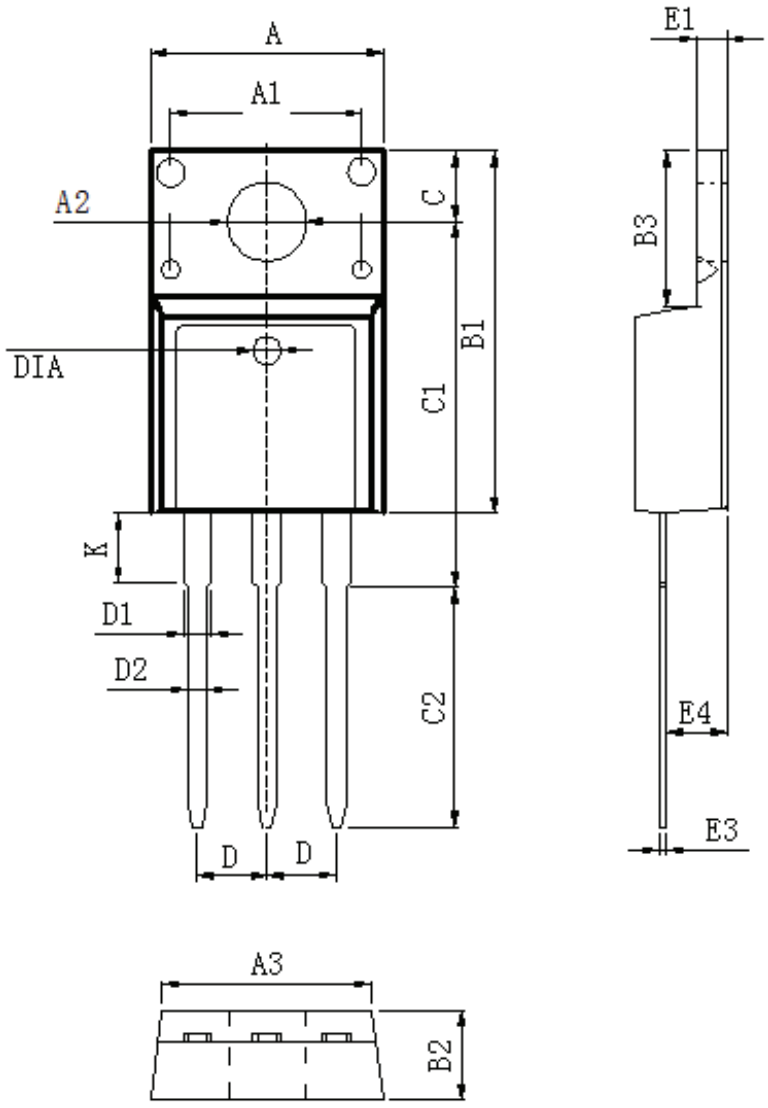
TO-262 Unit :mm



DIM	MILLIMETERS
A	9.98±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	23.9±0.3
h	3.1±0.2
h1	9.16±0.2
h2	13.2±0.2
L	0.5±0.1
l1	1.3±0.1
l2	0.8±0.1
N	2.45±0.1

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	⊙1.5(deep 0.2)