

# CMP/CMB/CMI/CMF60R170DT

600V, 159mΩ typ., 25A N-Channel Super Junction Power MOSFET

## General Description

The 60R170DT is power MOSFET using Cmos's advanced super junction technology. The resulting devices provide all benefits of a fast switching super junction MOSFET while offering an extremely fast and robust body diode. This combination of extremely low switching, commutation and conduction losses together with highest robustness make especially resonant switching applications more reliable, more efficient and lighter.

## Features

- Ultra-fast body diode
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant
- Deep Trench

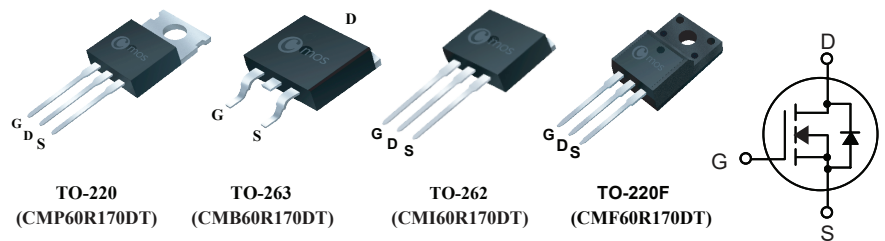
## Product Summary

BVDSS	R <sub>DS(on)</sub> max.	ID
600V	0.17Ω	25A

## Applications

- Charger
- Power Supply

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



## Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V <sub>DS</sub>	Drain-Source Voltage	600		V
V <sub>GS</sub>	Gate-Source Voltage	±30		V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current	25	25*	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current	16	16*	A
I <sub>DM</sub>	Pulsed Drain Current (Note 1)	100	100*	A
EAS	Single Pulse Avalanche Energy (Note 2)	540		mJ
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	250	45	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150		°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150		°C

\* Drain current limited by maximum junction temperature.

## Thermal Data

Symbol	Parameter	220/263/262	220F	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient Max.	62.5	62.5	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-case Max.	0.50	2.78	°C/W

### Electrical Characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=250\mu A$	600	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$ , $I_D=10A$	---	159	170	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=250\mu A$	3.5	---	5.5	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=600V$ , $V_{GS}=0V$	---	---	10	μA
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 30V$ , $V_{DS}=0V$	---	---	±100	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=15V$ , $I_D=10A$	---	9	---	S
$R_g$	Gate Resistance	$V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	3.8	---	Ω
$Q_g$	Total Gate Charge	$V_{DS}=300V$ , $I_D=25A$ $V_{GS}=10V$	---	50	---	nC
$Q_{gs}$	Gate-Source Charge		---	15	---	
$Q_{gd}$	Gate-Drain Charge		---	26	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=300V$ , $I_D=12.5A$ $R_G=10\Omega$ , $V_{GS}=10V$	---	35	---	ns
$T_r$	Rise Time		---	60	---	
$T_{d(off)}$	Turn-Off Delay Time		---	80	---	
$T_f$	Fall Time		---	30	---	
$C_{iss}$	Input Capacitance	$V_{DS}=100V$ , $V_{GS}=0V$ , $f=1\text{MHz}$	---	1400	---	pF
$C_{oss}$	Output Capacitance		---	60	---	
$C_{riss}$	Reverse Transfer Capacitance		---	9	---	

### Diode Characteristics

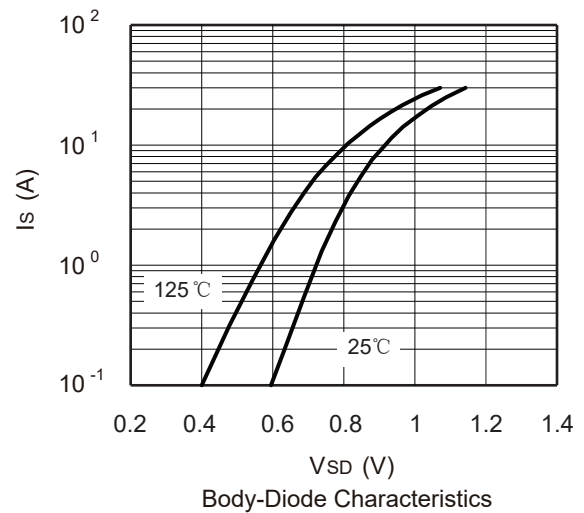
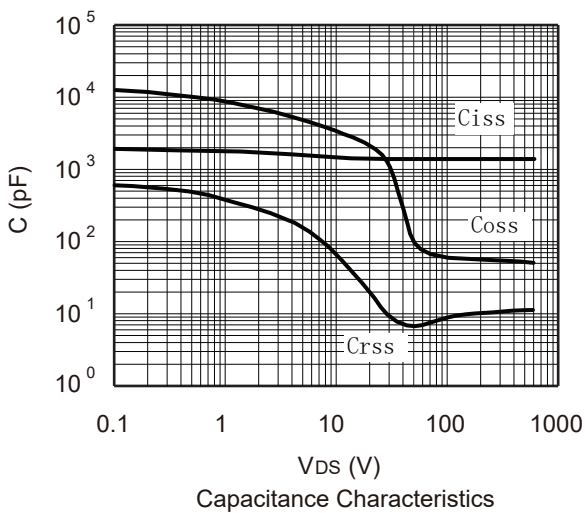
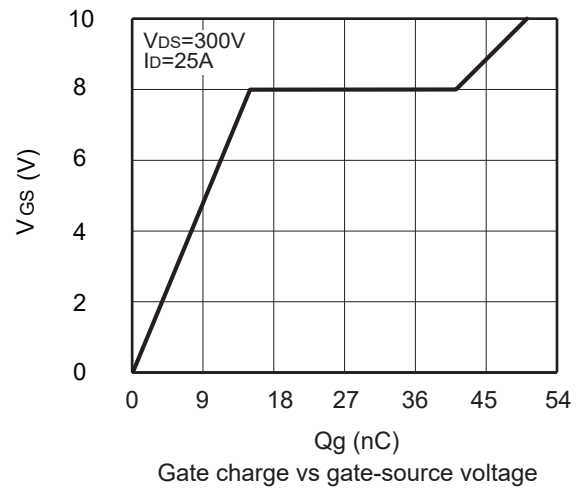
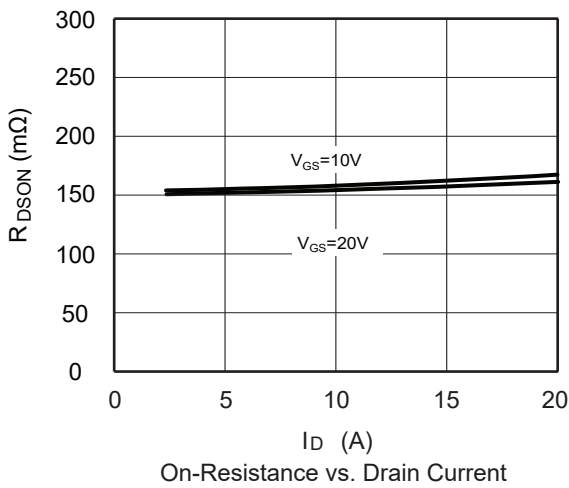
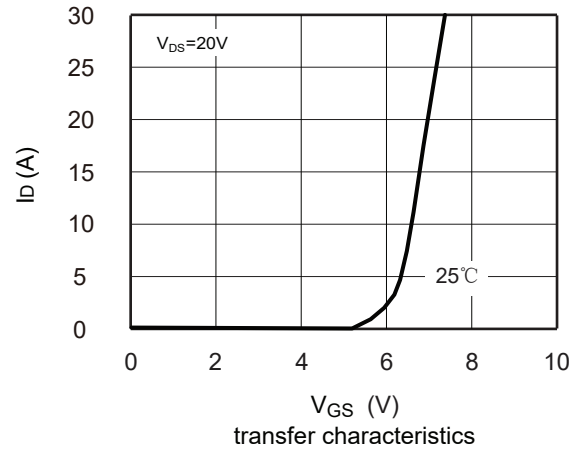
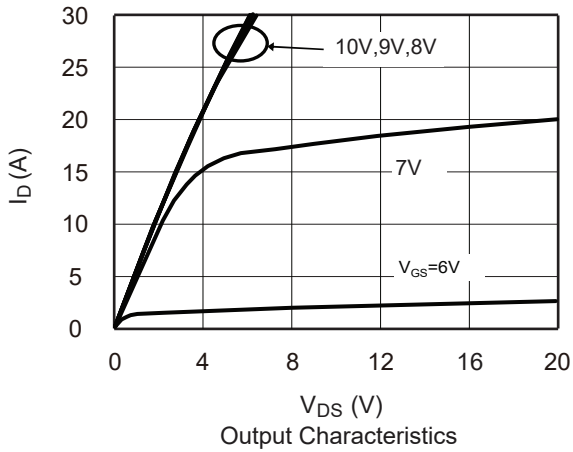
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	25	A
$I_{SM}$	Pulsed Source Current		---	---	100	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V$ , $I_S=15A$ , $T_J=25^{\circ}\text{C}$	---	0.93	1.5	V

Note :

1. Repetitive rating: Pulse width limited by maximum junction temperature.
2. The EAS data shows Max. rating . The test condition is  $V_{DD}=80V$  ,  $V_{GS}=10V$  ,  $L=30\text{mH}$  ,  $I_{AS}=6A$ .

This product has been designed and qualified for the consumer market.  
Cmos assumes no liability for customers' product design or applications.  
Cmos reserves the right to improve product design , functions and reliability without notice. Please refer to the latest version of specification.

### Typical Characteristics



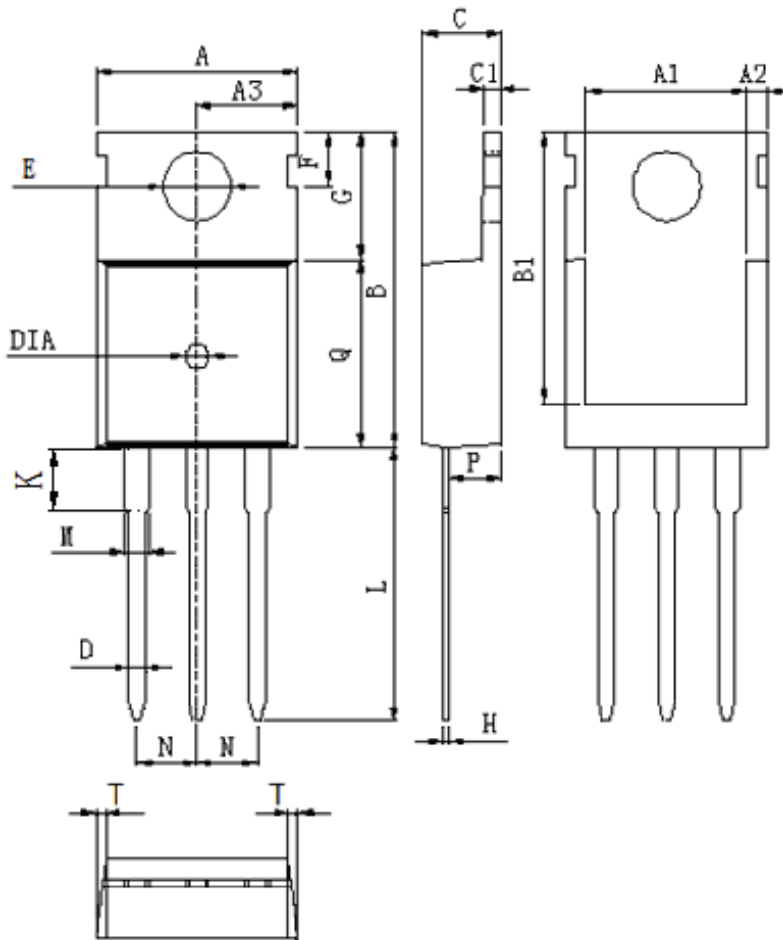
# CMP/CMB/CMI/CMF60R170DT

600V, 159mΩ typ., 25A N-Channel Super Junction Power MOSFET

## 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)

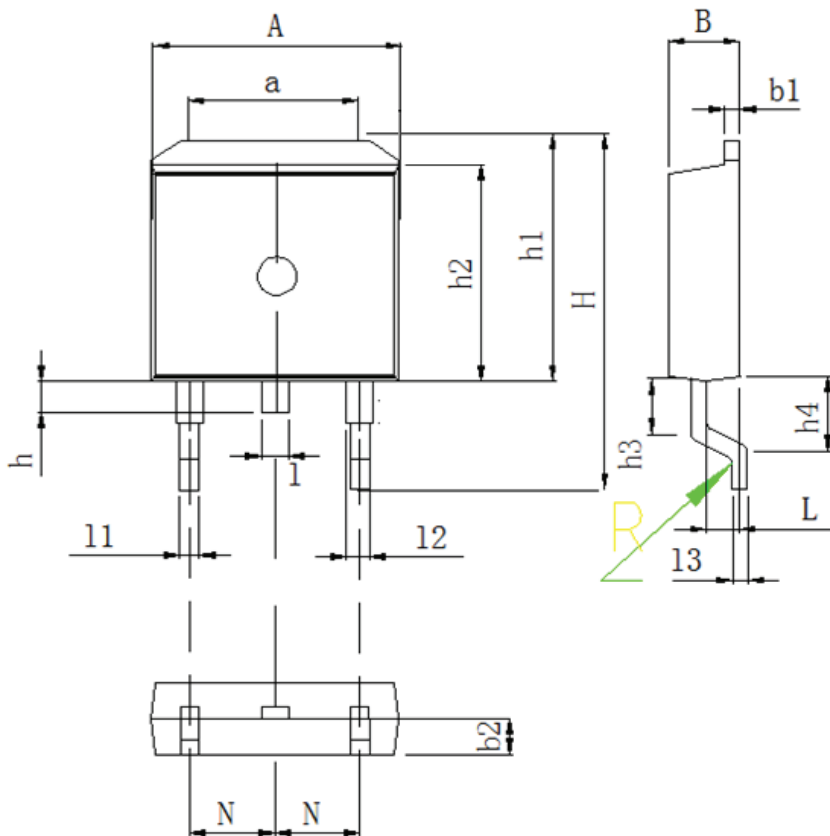
# CMP/CMB/CMI/CMF60R170DT

600V, 159mΩ typ., 25A N-Channel Super Junction Power MOSFET

## Package Dimension

TO-263

Unit :mm



DIM	MILLIMETERS
A	$9.8 \pm 0.2$
a	$7.4 \pm 0.4$
B	$4.5 \pm 0.2$
b1	$1.3 \pm 0.05$
b2	$2.4 \pm 0.2$
H	$15.5 \pm 0.3$
h	$1.54 \pm 0.2$
h1	$10.5 \pm 0.2$
h2	$9.2 \pm 0.1$
h3	$1.54 \pm 0.2$
h4	$2.7 \pm 0.2$
L	$2.4 \pm 0.2$
1	$1.3 \pm 0.1$
11	$0.8 \pm 0.1$
12	$1.3 \pm 0.1$
13	$0.5 \pm 0.1$
N	$2.54 \pm 0.1$
R	$0.5R \pm 0.05$

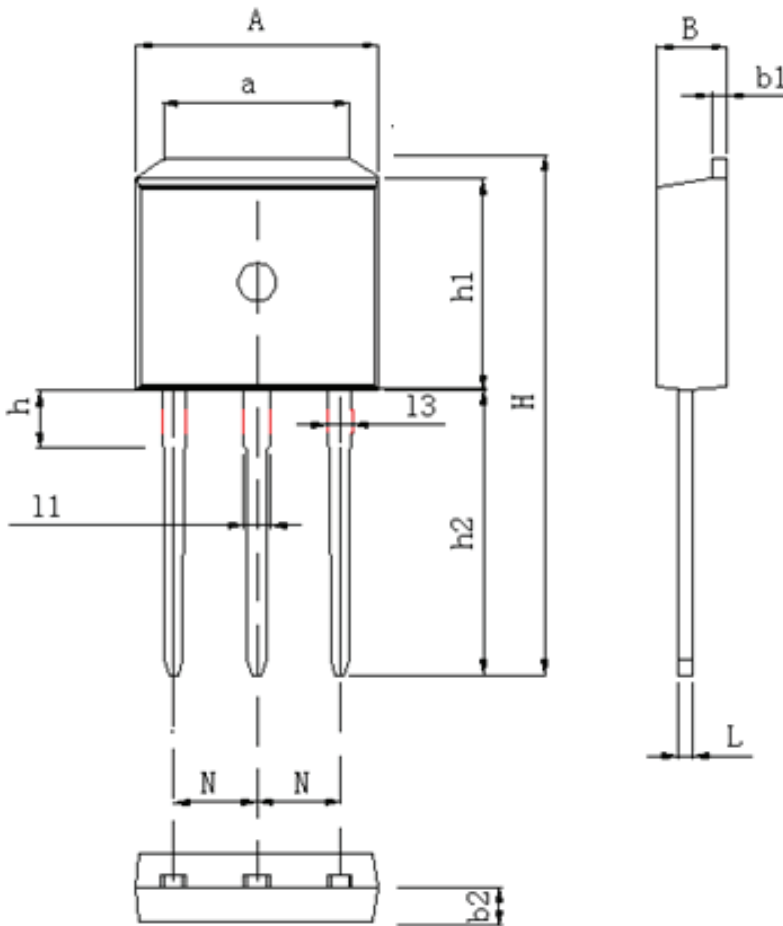
# CMP/CMB/CMI/CMF60R170DT

600V, 159mΩ typ., 25A N-Channel Super Junction Power MOSFET

## Package Dimension

TO-262

Unit :mm



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

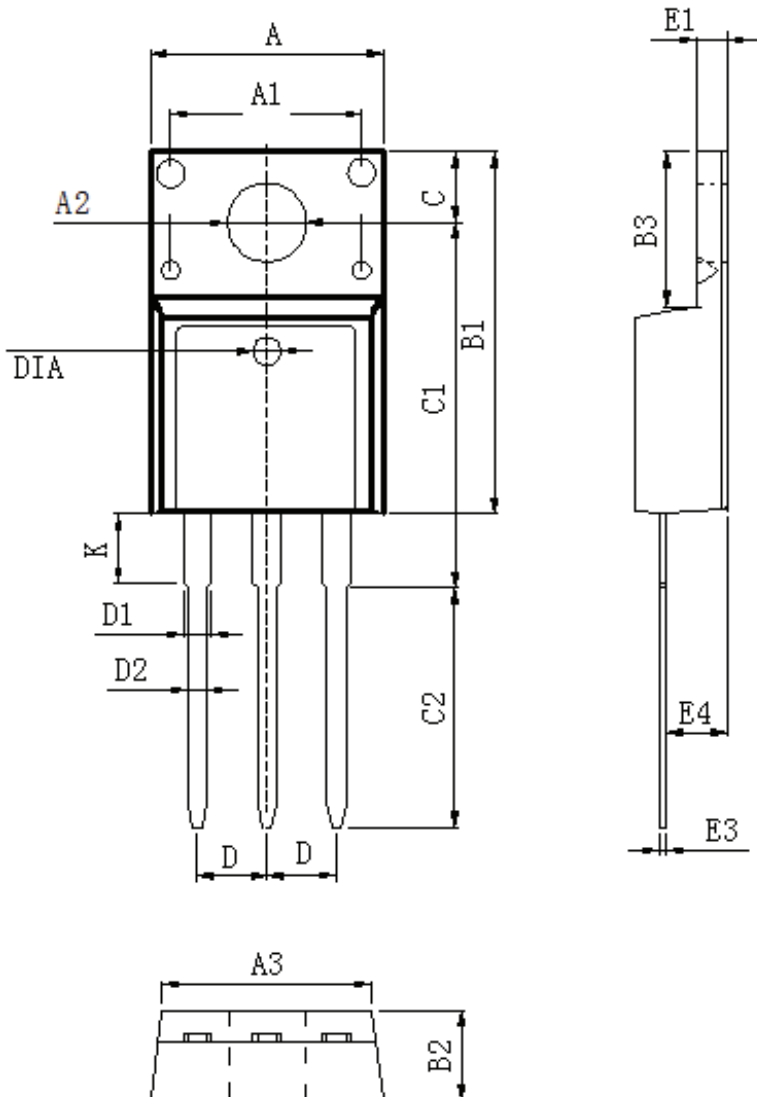
# CMP/CMB/CMI/CMF60R170DT

600V, 159mΩ typ., 25A N-Channel Super Junction Power MOSFET

## 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)