

General Description

The 5B65D is produced by using advanced field stop trench IGBT technology, which provides excellent quality and high-switching performance.

Features

- Low gate charge
- High efficient turn-on di/dt controllability
- Very fast and soft recovery freewheeling diode
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	650	V
V_{GES}	Gate-Emitter Voltage	± 20	V
$I_C@T_C=25^\circ\text{C}$	Collector Current	10	A
$I_C@T_C=100^\circ\text{C}$		5	A
I_{CM}	Pulsed Collector Current *	15	A
$I_F@T_C=100^\circ\text{C}$	Diode Continuous Forward Current	3	A
I_{FM}	Diode Maximum Forward Current *	9	A
$P_D@T_C=25^\circ\text{C}$	Maximum Power Dissipation	65	W
$P_D@T_C=100^\circ\text{C}$	Maximum Junction Temperature	25	W
T_j, T_{stg}	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$

* Repetitive rating : Pulse width limited by max. junction temperature

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R_{thJA}	Thermal Resistance, Junction-Ambient	---	110	$^\circ\text{C/W}$
R_{thJC}	Thermal Resistance, IGBT Junction-Case	---	1.92	$^\circ\text{C/W}$
R_{thJC}	Thermal Resistance, Diode Junction-Case	---	5	$^\circ\text{C/W}$

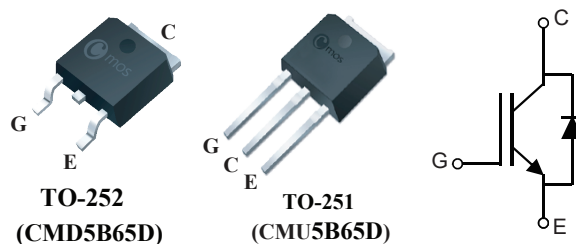
Product Summary

V_{CES}	I_C
650V	5A

Applications

- inverters
- Motor Drives
- PFC

TO-252/251 Pin Configuration



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

Symbol	Characteristic	Test Condition	Min.	Typ.	Max.	Unit
Static						
BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{CE}=0V$, $I_C=250\mu A$	650	---	---	V
I_{CES}	Collector Cut-off Current	$V_{GE}=0V$, $V_{CE}=650V$, $T_J = 25^{\circ}\text{C}$	---	---	1	μA
I_{GES}	Gate Leakage Current	$V_{CE}=0V$, $V_{GE}=\pm 20V$	---	---	± 100	nA
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$V_{CE} = V_{GE}$, $I_C=500\mu A$	4.5	---	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V$, $I_C=5A$, $T_J = 25^{\circ}\text{C}$	---	1.80	2.0	V
		$V_{GE}=15V$, $I_C=5A$, $T_J = 125^{\circ}\text{C}$	---	2.05	---	V
g_{fs}	Forward Transconductance	$V_{CE}=20V$, $I_C=5A$	---	3	---	S
Dynamic						
Q_g	Total Gate Charge	$V_{CE}=400V$, $V_{GE}=15V$, $I_C= 5A$ (Note 1)	---	12.5	---	nC
Q_{ge}	Gate-Emitter Charge		---	2.8	---	
Q_{gc}	Gate-Collector Charge		---	6.2	---	
R_g	Gate Resistance	$V_{GE}=0V$, $V_{CC}=0V$, $F= 1\text{MHz}$	---	3.2	---	Ω
$I_{C(sc)}$	Short circuit collector current	$V_{CC}=400V$, $V_{GE}=15V$, $T_{SC} \leq 10\mu S$, $T_J \leq 25^{\circ}\text{C}$ (Note 2)	---	30	---	A
$t_{d(on)}$	Turn-On Delay Time	$V_{CE}=400V$, $I_C=5A$, $V_{GE}=15V$, $R_{Gon}=10\Omega$, $R_{Goff}=10\Omega$ $T_{vj} = 25^{\circ}\text{C}$	---	20	---	ns
t_r	Rise Time		---	23	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	84	---	ns
t_f	Fall Time		---	56	---	ns
E_{on}	Turn-On Switching Loss		---	195	---	mJ
E_{off}	Turn-Off Switching Loss		---	84	---	mJ
E_{ts}	Total Switching Loss		---	279	---	mJ
C_{ies}	Input Capacitance	$V_{CE}=25V$, $V_{GE}=0V$, $f=1\text{MHz}$	---	260	---	pF
C_{oes}	Output Capacitance		---	40	---	
C_{res}	Reverse Transfer Capacitance		---	6	---	

Note :

1.Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

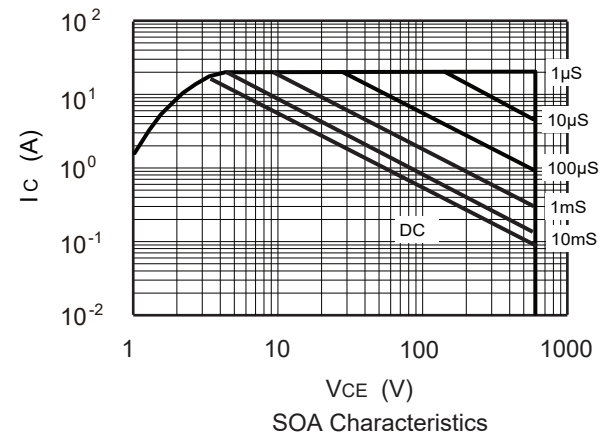
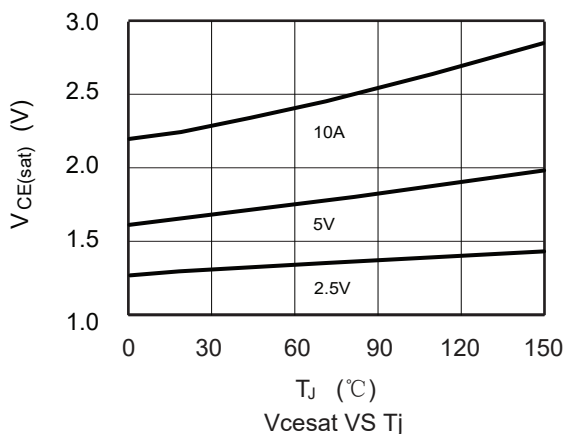
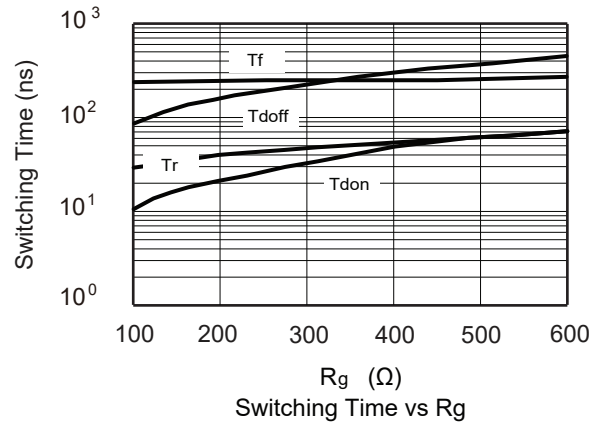
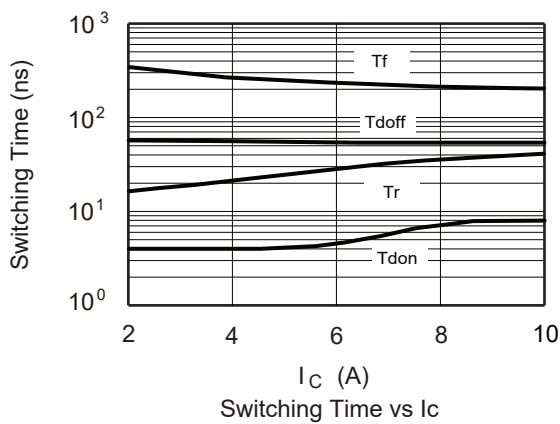
2.Allowed number of short circuits:<1000, time between short circuits: >1s.

Electrical Characteristic Of Diode

Symbol	Characteristic	Test Condition		Mim.	Typ.	Max.	Unit
V _F	Diode Forward Voltage	I _F = 10A	T _c =25℃	---	1.56	---	V
			T _c =150℃	---	1.35	---	
t _{rr}	Diode Reverse Recovery Time	I _F =5A di/dt =200A/μs V _{cc} =400V	T _c =25℃	---	195	---	ns
			T _c =150℃	---	273	---	
I _{rm}	Diode Peak Reverse Recovery Current		T _c =25℃	---	2.78	---	A
			T _c =150℃	---	3.3	---	
Q _{rr}	Diode Reverse Recovery Charge		T _c =25℃	---	0.24	---	μC
			T _c =150℃	---	0.38	---	

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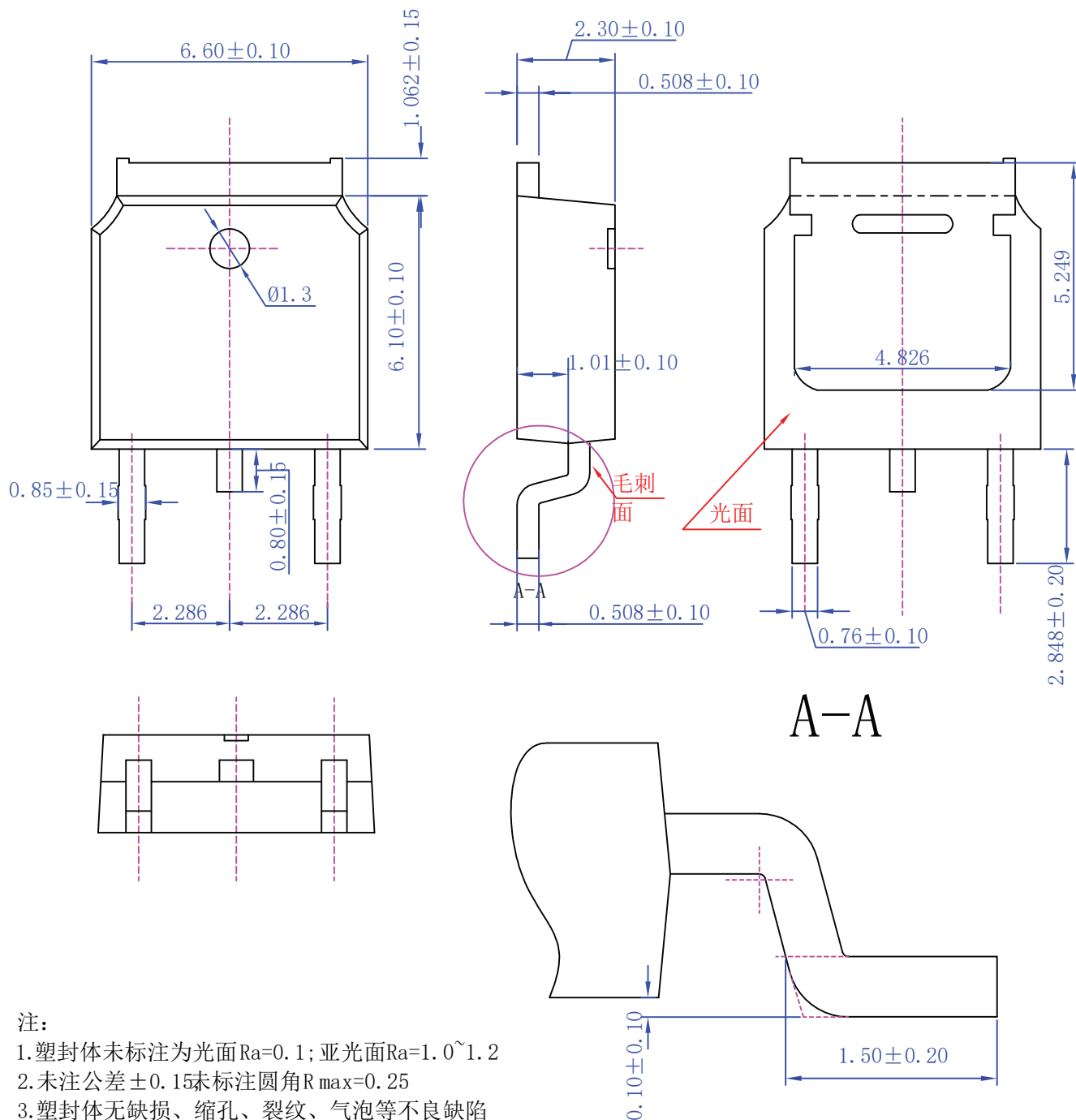
Typical electrical and thermal characteristics



Package Dimension

TO-252

Unit :mm



Package Dimension

TO-251A

Unit :mm

