

1200V/200A IGBT Power Module

CMT-PLA8963 - Preliminary Datasheet

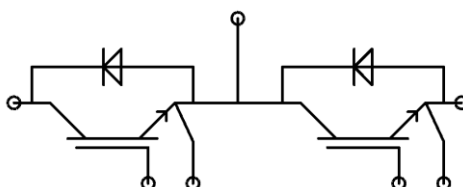
Version: 1.0
(see note 1)

Applications

- Inverter for Motor Drive
- UPS (Uninterruptible Power Supplies)
- Soft Switching Welding Machine
- AC and DC Servo Drive Amplifier

Features

- Low $V_{ce(sat)}$ with Field-Stop/Trench Technology: 1.85V @ 25°C/200A
- $V_{ce(sat)}$ with positive temperature coefficient
- Collector voltage up to 1200V
- Max Collector current: 200A DC @ $T_c=100^\circ\text{C}$
- Includes fast&soft recovery anti-parallel freewheeling diodes
- High short circuit capability (10 μs)
- Low inductance module structure
- Operating junction temperature from -55°C to $+175^\circ\text{C}$
- 62 mm Power Package
- RoHS compliant



Note1: Please always refer to the latest datasheet version available at:
<http://www.cissoid.com/files/files/products/planet/CMT-8963.pdf>

Absolute Maximum Ratings (Note 2)

Symbol	Parameter	Min.	Max.	Units
V_{CES}	Collector-Emitter Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_C	DC Collector Current ($T_C=100^\circ\text{C}$)		200	A
I_{Cpuls}	Pulsed Collector Current ($T_C=100^\circ\text{C}$)		300	V
P_{tot}	Power Dissipation per IGBT ($T_C=25^\circ\text{C}$)		1380	W
T_{JOP}	Operating Junction Temperature	-40	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-40	125	$^\circ\text{C}$
V_{isol}	Isolation Voltage (1min, 50Hz)	2500		V

Note 2 Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Frequent or extended exposure to absolute maximum rating conditions or above may affect device reliability.

IGBT Electrical Characteristics

($T_C=25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$V_{GE}=V_{CE}$, $I_C=3.3\text{mA}$ $T_J=25^\circ\text{C}$	5	6.2	6.8	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=200\text{A}$, $V_{GE}=15\text{V}$ $T_J=25^\circ\text{C}$		1.85	2.15	V
		$I_C=200\text{A}$, $V_{GE}=15\text{V}$ $T_J=125^\circ\text{C}$		2.15		V
I_{CES}	Collector Leakage Current	$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$ $T_J=25^\circ\text{C}$			0.8	mA
		$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$ $T_J=125^\circ\text{C}$			5	mA
I_{GES}	Gate Leakage Current	$V_{CE}=0\text{V}$, $V_{GE}=20\text{V}$ $T_J=25^\circ\text{C}$			400	nA
G_g	Gate Charge			2.8		μC
C_{ies}	Input Capacitance			21.2		nF
C_{oes}	Output Capacitance	$V_{CE}=0\text{V}$, $V_{GE}=0\text{V}$		1.42		nF
C_{res}	Reverse Transfer Capacitance	$F=1\text{MHz}$, $T_J=25^\circ\text{C}$		0.94		nF
R_{gint}	Internal Gate Resistance			1		Ω
$t_{d(on)}$	Turn-on Delay Time	$I_C=200\text{A}$, $V_{CE}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $T_J=25^\circ\text{C}$ $R_G=4.7\Omega$		574		ns
t_r	Rise Time			133		ns
$t_{d(off)}$	Turn-Off Delay Time			563		ns
t_f	Fall Time			120		ns
E_{on}	Turn-on Energy				26.8	
E_{off}	Turn-off Energy			28.4		mJ
$t_{d(on)}$	Turn-on Delay Time	$I_C=200\text{A}$, $V_{CE}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $T_J=25^\circ\text{C}$ $R_G=10\Omega$		604		ns
t_r	Rise Time			137		ns
$t_{d(off)}$	Turn-Off Delay Time			629		ns
t_f	Fall Time			167		ns
E_{on}	Turn-on Energy				35.1	
E_{off}	Turn-off Energy			35.9		mJ
I_{sc}	Short-Circuit Data	$T_P \leq 10\mu\text{s}$, $V_{GE}=15\text{V}$, $T_J=150^\circ\text{C}$, $V_{CC}=1200\text{V}$		1500		A

Diode Electrical Characteristics

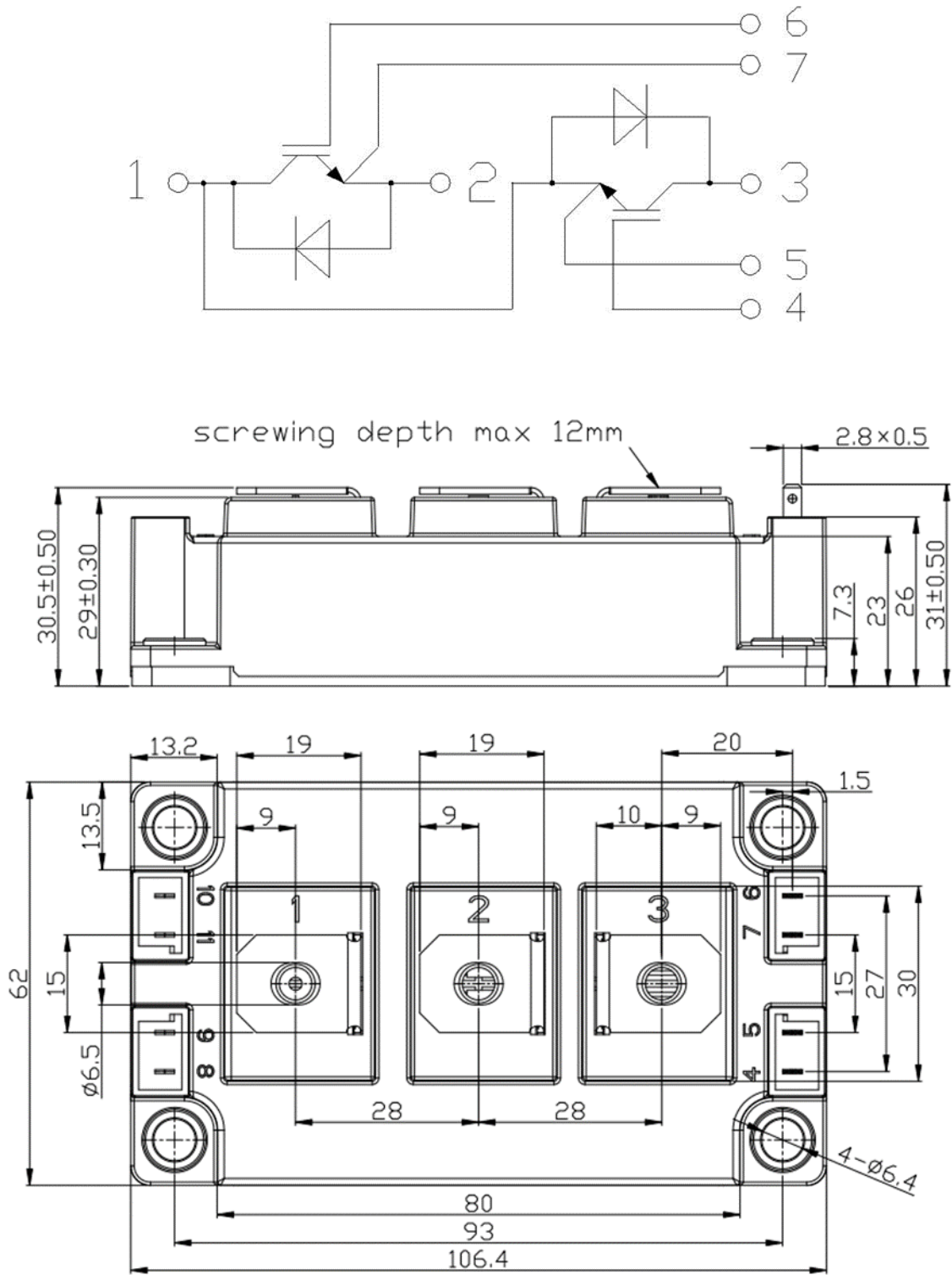
($T_C=25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Units
I_F	Diode DC Forward Current	$T_J=100^\circ\text{C}$		200		A
I_{FRM}	Diode Peak Forward Current	$t_p=1\text{ms}$		300		A
V_F	Diode Forward Voltage	$I_F=200\text{A}, T_J=25^\circ\text{C}$		2.1		V
		$I_F=200\text{A}, T_J=125^\circ\text{C}$		1.9		
Q_{rr}	Recovered Charge	$I_F=200\text{A}, V_R=600\text{V}$ $-di_F/dt=2300\text{A}/\mu\text{S}$ $T_J=25^\circ\text{C}$		23.8		μC
I_{rr}	Peak Reverse Recovery Current			182		A
t_{rr}	Reverse Recovery Time			232		ns
E_{rec}	Reverse Recovery Energy			12.3		mJ
Q_{rr}	Recovered Charge	$I_F=200\text{A}, V_R=600\text{V}$ $-di_F/dt=2300\text{A}/\mu\text{S}$ $T_J=125^\circ\text{C}$		56.4		μC
I_{rr}	Peak Reverse Recovery Current			272		A
t_{rr}	Reverse Recovery Time			531		ns
E_{rec}	Reverse Recovery Energy			31.1		mJ

Module Characteristics

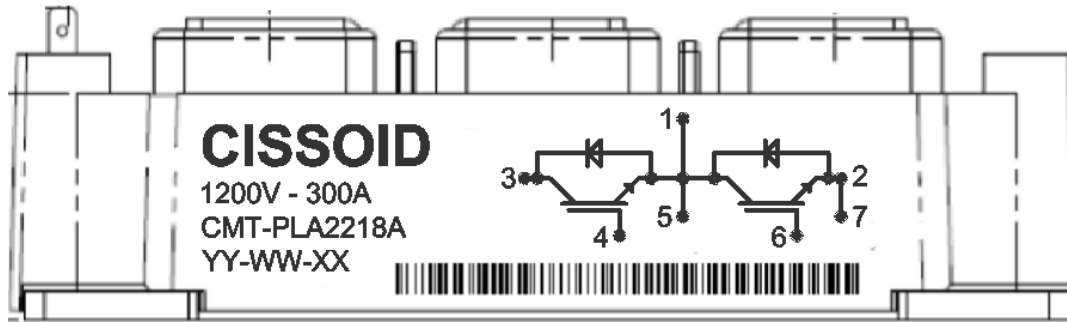
Symbol	Parameter	Test conditions	Min.	Typ	Max.	Units
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	per IGBT			0.076	$^\circ\text{C}/\text{W}$
		per Diode			0.1	$^\circ\text{C}/\text{W}$
$R_{\theta CS}$	Case-to-Sink Thermal Resistance	Conductive grease applied		0.035		$^\circ\text{C}/\text{W}$
M_t	Module Electrodes Torque	Recommended M5	2.5		5	N.m
M_s	Module-to-Sink Torque	Recommended M6	3		5	N.m
W	Module weight			300		g

Package Drawing



Physical dimensions in mm (tolerance : +/- 0.2 mm)

Marking information



YY	Year (last 2 digits)
WW	Week
XX	Assembly lot ID

Ordering Information

Product Name	Ordering Reference	Package	Marking
CMT-PLA8963	CMT-PLA8963A	62mm HB	CMT-PLA8963A

Contact & Ordering

CISSOID S.A.

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