

MITSUBISHI IGBT MODULES  
**CM30AD00-12H**

MEDIUM POWER SWITCHING USE  
 FLAT BASE, INSULATED TYPE

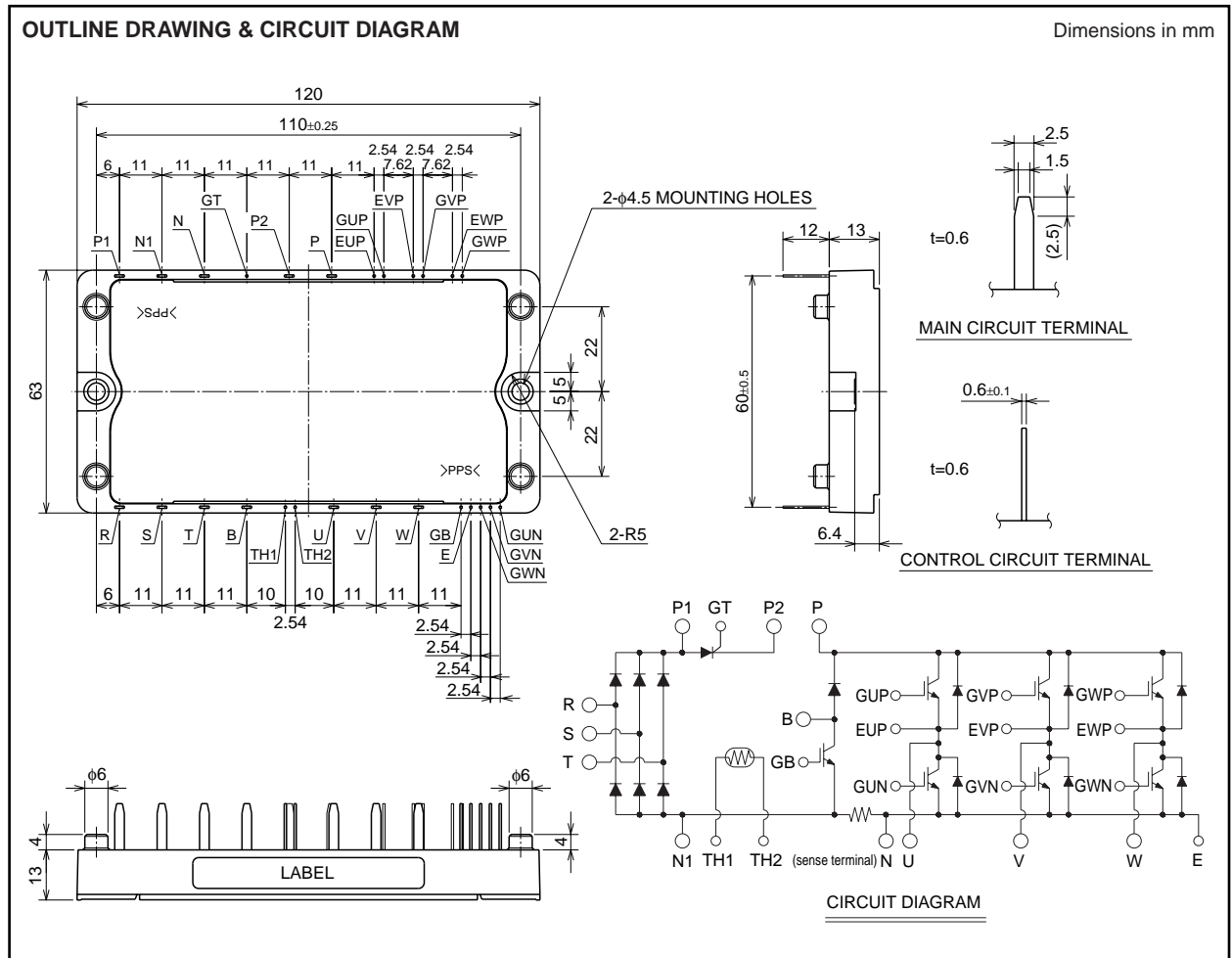
**CM30AD00-12H**



- IC ..... 30A
- VCES ..... 600V
- Insulated Type
- CIB Module
- 3φ Inverter + 3φ Converter + Brake Thyristor + Thermistor + Current shunt resistor

**APPLICATION**

AC & DC motor controls, General purpose inverters



**CM30AD00-12H**

MEDIUM POWER SWITCHING USE  
FLAT BASE, INSULATED TYPE

**MAXIMUM RATINGS (T<sub>J</sub> = 25°C)**

**INVERTER PART**

Symbol	Parameter	Conditions	Rating	Unit
V <sub>CES</sub>	Collector-emitter voltage	G-E Short	600	V
V <sub>GES</sub>	Gate-emitter voltage	C-E Short	±20	V
I <sub>C</sub>	Collector Current	T <sub>C</sub> = 25°C	30	A
I <sub>CM</sub>		PULSE (Note. 2)	60	A
I <sub>E</sub> (Note.1)	Emitter Current	T <sub>C</sub> = 25°C	30	A
I <sub>EM</sub> (Note.1)		PULSE (Note. 2)	60	A
P <sub>C</sub> (Note.3)	Maximum collector dissipation	T <sub>C</sub> = 25°C	73	W

**BRAKE PART**

Symbol	Parameter	Conditions	Rating	Unit
V <sub>CES</sub>	Collector-emitter voltage	G-E Short	600	V
V <sub>GES</sub>	Gate-emitter voltage	C-E Short	±20	V
I <sub>C</sub>	Collector Current	T <sub>C</sub> = 25°C	30	A
I <sub>CM</sub>		PULSE (Note. 2)	60	A
P <sub>C</sub> (Note.3)	Maximum collector dissipation	T <sub>C</sub> = 25°C	69	W
V <sub>RRM</sub>	Repetitive peak reverse voltage	Clamp diode part	600	V
I <sub>FM</sub> (Note.3)	Forward current	Clamp diode part	30	A

**CONVERTER PART**

Symbol	Parameter	Conditions	Rating	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		800	V
E <sub>a</sub>	Recommended AC input voltage		220	V
I <sub>O</sub>	DC output current	3φ rectifying circuit	30	A
I <sub>FSM</sub>	Surge (non-repetitive) forward current	1/2 cycle at 60Hz, peak value, Non-repetitive	500	A
I <sup>2</sup> t	I <sup>2</sup> t for fusing	Value for one cycle of surge current	1.0 × 10 <sup>3</sup>	A <sup>2</sup> s

**THYRISTOR PART**

Symbol	Parameter	Conditions	Rating	Unit
V <sub>DRM</sub>	Repetitive peak off-state voltage		800	V
V <sub>RRM</sub>	Repetitive peak reverse voltage		800	V
I <sub>T(AV)</sub>	Average on-state current	Single-phase, half-wave 180° conduction	30	A
I <sub>TSM</sub>	Surge (non-repetitive) on-state current	1/2 cycle at 60Hz, peak value Non-repetitive	500	A
P <sub>GM</sub>	Peak gate power dissipation		10	W
P <sub>G(AV)</sub>	Average gate power dissipation		1	W
I <sub>FGM</sub>	Peak gate forward current		3	A
V <sub>FGM</sub>	Peak gate forward voltage		10	V
V <sub>RGM</sub>	Peak gate reverse voltage		5	V
di/dt	Critical rate of rise of on-state Current	I <sub>G</sub> =100mA, V <sub>D</sub> =400V, dI <sub>G</sub> /dt=1A/μs	100	A/μs

**COMMON RATING**

Symbol	Parameter	Conditions	Rating	Unit
T <sub>J</sub>	Junction temperature	Inverter, brake, converter part	-40 ~ +150	°C
T <sub>J</sub>	Junction temperature	Thyristor part	-40 ~ +125	°C
T <sub>stg</sub>	Storage temperature		-40 ~ +125	°C
V <sub>iso</sub>	Isolation voltage	AC 1 min.	2500	V
—	Mounting torque	Mounting M4 screw	0.98 ~ 1.47	N·m
—	Weight	Typical value	140	g

**CM30AD00-12H**

MEDIUM POWER SWITCHING USE  
FLAT BASE, INSULATED TYPE

**ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C)  
INVERTER PART**

Symbol	Parameter	Test conditions	Limits			Unit		
			Min.	Typ.	Max.			
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	1	mA		
VGE(th)	Gate-emitter threshold voltage	IC = 3.0mA, VCE = 10V	4.5	6	7.5	V		
IGES	Gate-emitter cutoff current	VGE = VGES, VCE = 0V	—	—	0.5	μA		
VCE(sat)	Collector-emitter saturation voltage	T <sub>j</sub> = 25°C T <sub>j</sub> = 150°C	IC = 30A, VGE = 15V	(Note.4)	—	2.1	2.8	V
					—	2.15	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	—	3.0	nF		
Coes	Output capacitance		—	—	2.4	nF		
Cres	Reverse transfer capacitance		—	—	0.6	nF		
QG	Total gate charge	VCC = 300V, IC = 30A, VGE = 15V	—	90	—	nC		
td(on)	Turn-on delay time	VCC = 300V, IC = 30A	—	—	120	ns		
tr	Turn-on rise time	VGE1 = VGE2 = 15V	—	—	300	ns		
td(off)	Turn-off delay time	RG = 21Ω	—	—	200	ns		
tf	Turn-off fall time	Resistive load	—	—	300	ns		
VEC(Note.1)	Emitter-collector voltage	IE = 30A, VGE = 0V	—	—	2.8	V		
trr (Note.1)	Reverse recovery time	IE = 30A, VGE = 0V	—	—	110	ns		
Qrr (Note.1)	Reverse recovery charge	diE / dt = - 60A / μs	—	0.08	—	μC		
Rth(j-c)Q	Thermal resistance	IGBT part, Per 1/6 module	—	—	1.7	°C/W		
Rth(j-c)R		FWDi part, Per 1/6 module	—	—	2.7	°C/W		

**BRAKE PART**

Symbol	Parameter	Test conditions	Limits			Unit		
			Min.	Typ.	Max.			
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	1	mA		
VGE(th)	Gate-emitter threshold voltage	IC = 3.0mA, VCE = 10V	4.5	6	7.5	V		
IGES	Gate-emitter cutoff current	VGE = VGES, VCE = 0V	—	—	0.5	μA		
VCE(sat)	Collector-emitter saturation voltage	T <sub>j</sub> = 25°C T <sub>j</sub> = 150°C	IC = 30A, VGE = 15V	(Note.4)	—	2.1	2.8	V
					—	2.15	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	—	3.0	nF		
Coes	Output capacitance		—	—	2.4	nF		
Cres	Reverse transfer capacitance		—	—	0.6	nF		
QG	Total gate charge	VCC = 300V, IC = 30A, VGE = 15V	—	90	—	nC		
VFM	Forward voltage drop	IF = 30A, Clamp diode part	—	—	2.8	V		
Rth(j-c)Q	Thermal resistance	IGBT part	—	—	1.8	°C/W		
Rth(j-c)R		Clamp diode part	—	—	2.8	°C/W		

**CONVERTER PART**

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IRRM	Repetitive reverse current	VR = VRRM, T <sub>j</sub> = 150°C	—	—	8	mA
VFM	Forward voltage drop	IF = 30A	—	—	1.5	V
Rth(j-c)	Thermal resistance	Per 1/6 module	—	—	1.7	°C/W

## CM30AD00-12H

MEDIUM POWER SWITCHING USE  
FLAT BASE, INSULATED TYPE

## THYRISTOR PART

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IDRM	Repetitive peak off-state current	V <sub>D</sub> =800V	—	—	1	mA
IRRM	Repetitive peak reverse current	V <sub>R</sub> =800V	—	—	1	mA
ITM	On-state voltage	I <sub>T</sub> =30A, instantaneous means	—	—	1.19	V
IGT	Gate trigger current	V <sub>D</sub> =6V, I <sub>T</sub> =1A	—	—	100	mA
VGT	Gate trigger voltage	V <sub>D</sub> =6V, I <sub>T</sub> =1A	—	—	3	V
dv/dt	Critical rate of rise of off-state Voltage	T <sub>j</sub> =125°C, V <sub>D</sub> =540V, exp. waveform	500	—	—	V/μs
I <sub>H</sub>	Holding current		—	50	—	mA
R <sub>th(j-c)</sub>	Thermal resistance		—	—	1.3	°C/W

## THERMISTOR PART

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
R <sub>TH</sub>	Resistance	T <sub>c</sub> = 25°C	—	100	—	kΩ
B	B Constant	Resistance at 25°C, 50°C (Note.5)	—	4000	—	K

## RESISTOR PART

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
R	Resistance	Measured between N-N1	—	2.9	—	mΩ
—	Temperature coefficient		—	0.051	—	%/°C

## COMMON RATING

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
R <sub>th(c-f)</sub>	Contact thermal resistance	Case to fin, Thermal compound applied*1 (1 module)	—	0.035	—	°C/W

Note. 1 I<sub>E</sub>, V<sub>EC</sub>, t<sub>rr</sub>, Q<sub>rr</sub>, diE/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode.

2 Pulse width and repetition rate should be such that the device junction temp. (T<sub>j</sub>) does not exceed T<sub>jmax</sub> rating.

3 Junction temperature (T<sub>j</sub>) should not increase beyond 150°C.

4 Pulse width and repetition rate should be such as to cause negligible temperature rise.

5  $B = (\ln R_1 - \ln R_2) / (1/T_1 - 1/T_2)$       R<sub>1</sub>: Resistance at T<sub>1</sub>(K)

R<sub>2</sub>: Resistance at T<sub>2</sub>(K)

\*1 : Typical value is measured by using Shin-etsu Silicone "G-746".



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

[LittleDiode.com](http://LittleDiode.com)

Looking forward to providing you with the best possible service.