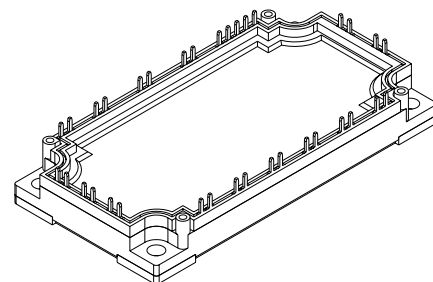
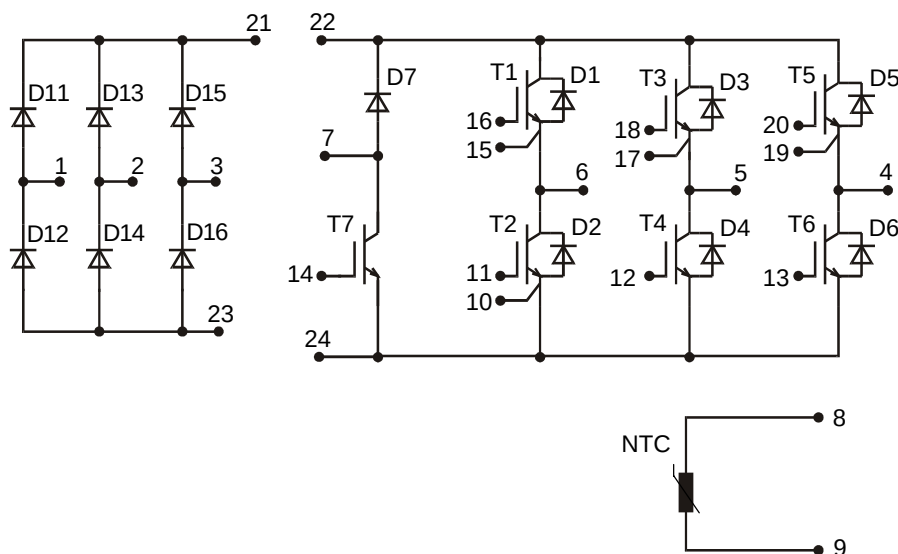


Converter - Brake - Inverter Module (CBI3)



Three Phase Rectifier	Brake Chopper	Three Phase Inverter
$V_{RRM} = 1600V$	$V_{CES} = 1200 V$	$V_{CES} = 1200 V$
$I_{FAVM} = 70 A$	$I_{C25} = 52 A$	$I_{C25} = 90 A$
$I_{FSM} = 700 A$	$V_{CE(sat)} = 2.2 V$	$V_{CE(sat)} = 1.9 V$

Input Rectifier Bridge D11 - D16

Symbol	Conditions	Maximum Ratings	
V_{RRM}		1600	V
I_{FAV}	$T_C = 80^\circ C$; sine 180°	50	A
I_{DAVM}	$T_C = 80^\circ C$; rectangular; $d = 1/3$; bridge	140	A
I_{FSM}	$T_{VJ} = 25^\circ C$; $t = 10$ ms; sine 50 Hz	700	A
P_{tot}	$T_C = 25^\circ C$	135	W

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^\circ C$, unless otherwise specified)		
		min.	typ.	max.
V_F	$I_F = 50 A$; $T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$		1.1 1.1	1.3 V V
I_R	$V_R = V_{RRM}$; $T_{VJ} = 25^\circ C$ $T_{VJ} = 125^\circ C$		0.8	0.05 mA mA
R_{thJC}	(per diode)			0.94 K/W

Application: AC motor drives with

- Input from single or three phase grid
- Three phase synchronous or asynchronous motor
- electric braking operation

Features

- High level of integration - only one power semiconductor module required for the whole drive
- IGBT technology with low saturation voltage, low switching losses and tail current, high RBSOA and short circuit ruggedness
- Epitaxial free wheeling diodes with Hyperfast and soft reverse recovery
- Industry standard package with insulated copper base plate and soldering pins for PCB mounting
- Temperature sense included

Output Inverter T1 - T6

Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	1200	V
V_{GES}	Continuous	± 20	V
I_{C25}	$T_C = 25^{\circ}\text{C}$	90	A
I_{C80}	$T_C = 80^{\circ}\text{C}$	62	A
I_{CM}	$V_{GE} = \pm 15\text{ V}$; $R_G = 22\ \Omega$; $T_{VJ} = 125^{\circ}\text{C}$	100	A
V_{CEK}	RBSOA; Clamped inductive load; $L = 100\ \mu\text{H}$	V_{CES}	
t_{SC} (SCSOA)	$V_{CE} = 900\text{ V}$; $V_{GE} = \pm 15\text{ V}$; $R_G = 22\ \Omega$; $T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	350	W

Symbol	Conditions	Characteristic Values		
		(T _{VJ} = 25°C, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 50\text{ A}$; $V_{GE} = 15\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	1.9 2.1		2.4 V
$V_{GE(th)}$	$I_C = 2\text{ mA}$; $V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}$; $V_{GE} = 0\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	0.8		0.8 mA mA
I_{GES}	$V_{CE} = 0\text{ V}$; $V_{GE} = \pm 20\text{ V}$			200 nA
$t_{d(on)}$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600\text{ V}$; $I_C = 50\text{ A}$ $V_{GE} = \pm 15\text{ V}$; $R_G = 22\ \Omega$	150		ns
t_r		60		ns
$t_{d(off)}$		680		ns
t_f		50		ns
E_{on}		6		mJ
E_{off}		5		mJ
C_{ies}	$V_{CE} = 25\text{ V}$; $V_{GE} = 0\text{ V}$; $f = 1\text{ MHz}$	3.8		nF
Q_{Gon}	$V_{CE} = 600\text{ V}$; $V_{GE} = 15\text{ V}$; $I_C = 50\text{ A}$	500		nC
R_{thJC}	(per IGBT)			0.35 K/W

Output Inverter D1 - D6

Symbol	Conditions	Maximum Ratings	
I_{F25}	$T_C = 25^{\circ}\text{C}$	110	A
I_{F80}	$T_C = 80^{\circ}\text{C}$	70	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 50\text{ A}$; $V_{GE} = 0\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$	2.1 1.5		2.5 V
I_{RM}	$I_F = 60\text{ A}$; $di_F/dt = -500\text{ A}/\mu\text{s}$; $T_{VJ} = 125^{\circ}\text{C}$ $V_R = 600\text{ V}$; $V_{GE} = 0\text{ V}$	41		A
t_{rr}		200		ns
R_{thJC}	(per diode)			0.61 K/W

Brake Chopper T7

Symbol	Conditions	Maximum Ratings	
V_{CES}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	1200	V
V_{GES}	Continuous	± 20	V
I_{C25}	$T_C = 25^{\circ}\text{C}$	52	A
I_{C80}	$T_C = 80^{\circ}\text{C}$	35	A
I_{CM}	$V_{GE} = \pm 15\text{ V}$; $R_G = 39\ \Omega$; $T_{VJ} = 125^{\circ}\text{C}$	50	A
V_{CEK}	RBSOA; Clamped inductive load; $L = 100\ \mu\text{H}$	V_{CES}	
t_{SC} (SCSOA)	$V_{CE} = 900\text{ V}$; $V_{GE} = \pm 15\text{ V}$; $R_G = 39\ \Omega$; $T_{VJ} = 125^{\circ}\text{C}$ non-repetitive	10	μs
P_{tot}	$T_C = 25^{\circ}\text{C}$	225	W

Symbol	Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
$V_{CE(sat)}$	$I_C = 35\text{ A}$; $V_{GE} = 15\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		2.2 2.5	2.8 V
$V_{GE(th)}$	$I_C = 1\text{ mA}$; $V_{GE} = V_{CE}$	4.5		6.5 V
I_{CES}	$V_{CE} = V_{CES}$; $V_{GE} = 0\text{ V}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.1	0.1 mA mA
I_{GES}	$V_{CE} = 0\text{ V}$; $V_{GE} = \pm 20\text{ V}$			200 nA
$t_{d(on)}$	Inductive load, $T_{VJ} = 125^{\circ}\text{C}$ $V_{CE} = 600\text{ V}$; $I_C = 35\text{ A}$ $V_{GE} = \pm 15\text{ V}$; $R_G = 39\ \Omega$		150	ns
t_r			60	ns
$t_{d(off)}$			680	ns
t_f			50	ns
E_{on}			4.2	mJ
E_{off}			3.5	mJ
C_{ies}	$V_{CE} = 25\text{ V}$; $V_{GE} = 0\text{ V}$; $f = 1\text{ MHz}$		2	nF
Q_{Gon}	$V_{CE} = 600\text{ V}$; $V_{GE} = 15\text{ V}$; $I_C = 25\text{ A}$		250	nC
R_{thJC}				0.55 K/W

Brake Chopper D7

Symbol	Conditions	Maximum Ratings	
V_{RRM}	$T_{VJ} = 25^{\circ}\text{C}$ to 150°C	1200	V
I_{F25}	$T_C = 25^{\circ}\text{C}$	25	A
I_{F80}	$T_C = 80^{\circ}\text{C}$	16	A

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
V_F	$I_F = 35\text{ A}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		3.0 2.3	3.4 V
I_R	$V_R = V_{RRM}$; $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = 125^{\circ}\text{C}$		0.1	0.1 mA mA
I_{RM}	$I_F = 15\text{ A}$; $di_F/dt = -400\text{ A}/\mu\text{s}$; $T_{VJ} = 125^{\circ}\text{C}$ $V_R = 600\text{ V}$		16	A
t_{rr}			130	ns
R_{thJC}				2.1 K/W

Temperature Sensor NTC

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
R₂₅	T = 25°C	4.75	5.0	5.25 kΩ
B_{25/50}			3375	K

Module

Symbol	Conditions	Maximum Ratings	
T_{VJ}		-40...+150	°C
T_{JM}		150	°C
T_{stg}		-40...+125	°C
V_{ISOL}	$I_{ISOL} \leq 1 \text{ mA}; 50/60 \text{ Hz}$	2500	V~
M_d	Mounting torque (M5)	3 - 6	Nm

Symbol	Conditions	Characteristic Values		
		min.	typ.	max.
$R_{\text{pin-chip}}$			5	mΩ
d_s	Creepage distance on surface	6		mm
d_A	Strike distance in air	6		mm
R_{thCH}	with heatsink compound		0.01	K/W
Weight			300	g

Dimensions in mm (1 mm = 0.0394")

