NXH35C120L2C2SG

Product Preview

TMPIM 35 A CIB Module

The NXH35C120L2C2SG is a transfer−molded power module containing a converter−inverter−brake circuit consisting of six 50 A, 1600 V rectifiers, seven 35 A, 1200 V IGBTs with inverse diodes and an NTC thermistor.

Features

- Low Package Height
- Compact 73 mm x 40 mm x 8 mm Package
- Solderable Pins
- Thermistor

Typical Applications

- Industrial Motor Drives
- Servo Drives

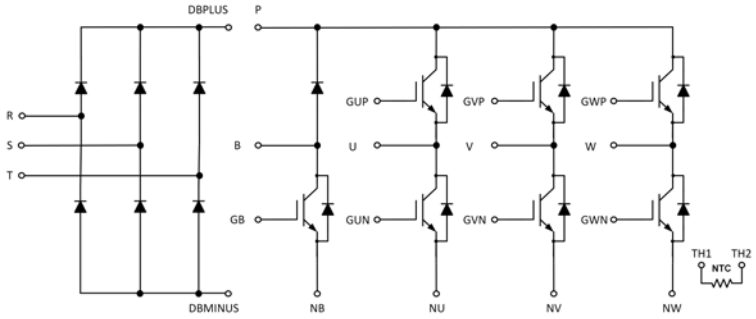

Figure 1. NXH35C120L2C2SG Schematic Diagram

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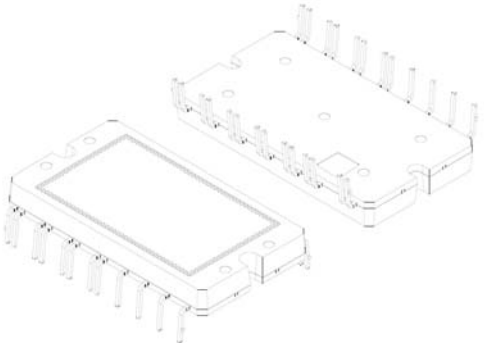


TMPIM DIP−C2
CASE TBD

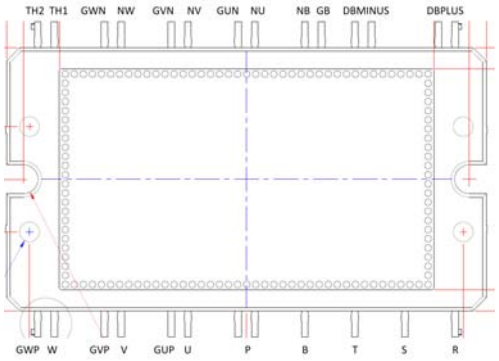


Table 1. MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
IGBT			
Collector−Emitter Voltage	V_{CES}	1200	V
Gate−Emitter Voltage	V_{GE}	±20	V
Continuous Collector Current @ T_h = 80°C (T_J = 175°C)	I_C	44	A
Pulsed Collector Current (T_J = 175°C)	I_{Cpulse}	70	A
Maximum Power Dissipation @ T_h = 80°C (T_J = 175°C)	P_{tot}	97	W
Short Circuit Withstand Time @ V_{GE} = 15 V, V_{CE} = 600 V, $T_J \leq$ 150°C	T_{sc}	(10)	μs
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	175	°C
IGBT INVERSE DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	1200	V
Continuous Forward Current @ T_h = 80°C (T_J = 175°C)	I_F	26	A
Repetitive Peak Forward Current (T_J = 175°C)	I_{FRM}	70	A
Maximum Power Dissipation (T_J = 175°C)	P_{tot}	(TBD)	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	175	°C
RECTIFIER DIODE			
Peak Repetitive Reverse Voltage	V_{RRM}	1600	V
Continuous Forward Current @ T_c = 80°C (T_J = 150°C)	I_F	60	A
Repetitive Peak Forward Current (T_J = 150°C)	I_{FRM}	(TBD)	A
Maximum Power Dissipation (T_J = 150°C)	P_{tot}	(TBD)	W
Minimum Operating Junction Temperature	T_{JMIN}	−40	°C
Maximum Operating Junction Temperature	T_{JMAX}	125	°C
THERMAL PROPERTIES			
Storage Temperature range	T_{stg}	−40 to 150	°C
INSULATION PROPERTIES			
Isolation test voltage, t = 1 sec, 60 Hz	V_{is}	4000	V_{RMS}
Clearance distance		Target 5	mm

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Refer to ELECTRICAL CHARACTERISTICS, RECOMMENDED OPERATING RANGES and/or APPLICATION INFORMATION for Safe Operating parameters.

Table 2. RECOMMENDED OPERATING RANGES

Rating	Symbol	Min	Max	Unit
Module Operating Junction Temperature	T_J	−40	T_{JMAX} − 25	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

Table 3. ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
IGBT CHARACTERISTICS						
Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 650 V	I_{CES}	–	–	250	μA
Collector−Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 35 A, T_J = 25°C	$V_{CE(sat)}$	–	2.10	(TBD)	V
	V_{GE} = 15 V, I_C = 35 A, T_J = 125°C		–	2.20	–	
Gate−Emitter Threshold Voltage	V_{GE} = V_{CE}, I_C = 40 mA	$V_{GE(TH)}$	5.2	5.6	6.4	V
Gate Leakage Current	V_{GE} = 20 V, V_{CE} = 0 V	I_{GES}	–	–	400	nA
Turn−on Delay Time	T_J = 25°C V_{CE} = 600 V, I_C = 35 A V_{GE} = ±15 V, R_G = 12 Ω	$t_{d(on)}$	–	(TBD)	–	ns
Rise Time		t_r	–	(TBD)	–	
Turn−off Delay Time		$t_{d(off)}$	–	(TBD)	–	
Fall Time		t_f	–	(TBD)	–	
Turn−on Switching Loss per Pulse		E_{on}	–	2300	–	μJ
Turn off Switching Loss per Pulse		E_{off}	–	1350	–	
Turn−on Delay Time	T_J = 125°C V_{CE} = 600 V, I_C = 35 A V_{GE} = ±15 V, R_G = 12 Ω	$t_{d(on)}$	–	(TBD)	–	ns
Rise Time		t_r	–	(TBD)	–	
Turn−off Delay Time		$t_{d(off)}$	–	(TBD)	–	
Fall Time		t_f	–	(TBD)	–	
Turn−on Switching Loss per Pulse		E_{on}	–	3730	–	μJ
Turn off Switching Loss per Pulse		E_{off}	–	2100	–	
Input Capacitance	V_{CE} = 25 V. V_{GE} = 0 V. f = 10 kHz	C_{ies}	–	8841	–	pF
Output Capacitance		C_{oes}	–	267	–	
Reverse Transfer Capacitance		C_{res}	–	141	–	
Total Gate Charge	V_{CE} = 600 V, I_C = 35 A, V_{GE} = ±15 V	Q_g	–	450	–	nC
Thermal Resistance − chip−to−case		R_{thJC}	–	0.97	–	°C/W
INVERSE DIODE CHARACTERISTICS						
Diode Forward Voltage	I_F = 35 A, T_J = 25°C	V_F	–	2.12	(TBD)	V
	I_F = 35 A, T_J = 125°C		–	2.38	–	
Reverse Recovery Time	T_J = 25°C V_{CE} = 600 V, I_C = 35 A V_{GE} = ±15 V, R_G = 22 Ω	t_{rr}	–	(TBD)	–	ns
Reverse Recovery Charge		Q_{rr}	–	(TBD)	–	μC
Peak Reverse Recovery Current		I_{RRM}	–	(TBD)	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	89	–	A/μs
Reverse Recovery Energy		E_{rr}	–	564	–	μJ
Reverse Recovery Time	T_J = 125°C V_{CE} = 600 V, I_C = 35 A V_{GE} = ±15 V, R_G = 22 Ω	t_{rr}	–	(TBD)	–	ns
Reverse Recovery Charge		Q_{rr}	–	(TBD)	–	μC
Peak Reverse Recovery Current		I_{RRM}	–	(TBD)	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	(TBD)	–	A/μs
Reverse Recovery Energy		E_{rr}	–	1651	–	μJ
Thermal Resistance − chip−to−case	Thermal grease, Thickness = 50 μm, λ = 2.6 W/mK	R_{thJH}	–	(TBD)	–	°C/W
RECTIFIER DIODE CHARACTERISTICS						
Diode Forward Voltage	I_F = 35 A, T_J = 25°C	V_F	–	2.41	–	V
	I_F = 35 A, T_J = 125°C		–	2.12	–	

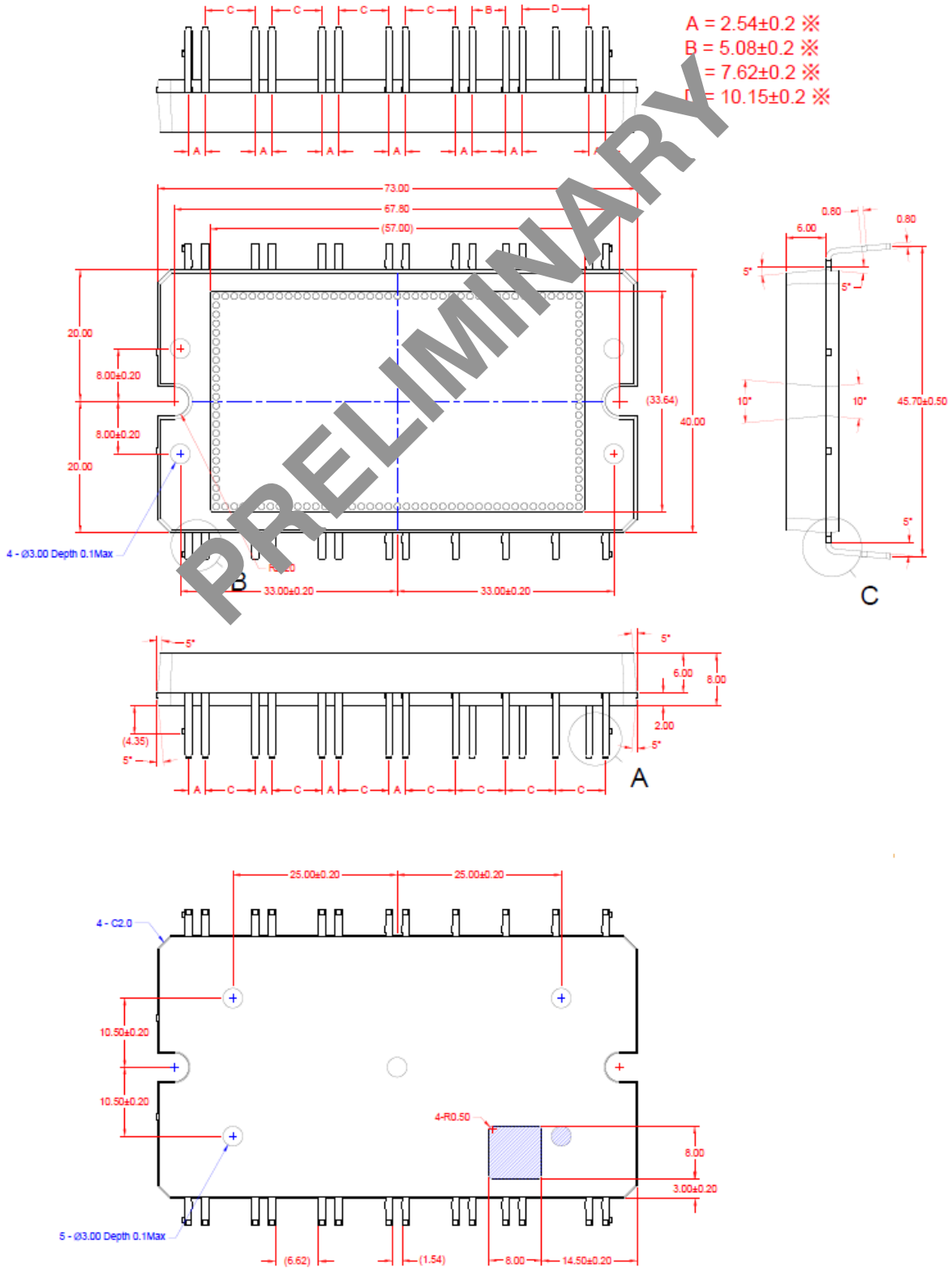
Table 3. ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
RECTIFIER DIODE CHARACTERISTICS						
Thermal Resistance – chip–to–case	Thermal grease, Thickness = 100 μm, λ = 2.5 W/mK	R_{thJH}	–	(TBD)	–	°C/W
THERMISTOR CHARACTERISTICS						
Nominal resistance	T = 25°C	R_{25}	–	5	–	kΩ
Nominal resistance	T = 100°C	R_{100}	–	457	–	Ω
Deviation of R25		ΔR/R	–3	–	3	%
Power dissipation		P_D	–	50	–	mW
Power dissipation constant			–	5	–	mW/K
B–value	B(25/50), tolerance ±3%		–	3375	–	K
B–value	B(25/100), tolerance ±3%		–	3455	–	K

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

PACKAGE OUTLINE

PRELIMINARY
CASE TBD
ISSUE O



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