NXH160T120L2Q2F2SG

Split T-Type NPC Power Module

1200 V, 160 A IGBT, 600 V, 100 A IGBT

The NXH160T120L2Q2F2SG is a power module containing a split T type neutral point clamped three level inverter, consisting of two 160 A / 1200 V Half Bridge IGBTs with inverse diodes, two Neutral Point 120 A / 600 V rectifiers, two 100 A / 600 V Neutral Point IGBTs with inverse diodes, two Half Bridge 60 A / 1200 V rectifiers and a negative temperature coefficient thermistor (NTC).

Features

- Split T type Neutral Point Clamped Three level Inverter Module
- 1200 V IGBT Specifications: $V_{CE(SAT)}$ = 2.15 V, E_{SW} = 4300 μJ
- 600 V IGBT specifications: $V_{CE(SAT)}$ = 1.47 V, E_{SW} = 2560 μJ
- Baseplate
- Solderable Pins
- Thermistor

Typical Applications

- Solar Inverters
- Uninterruptible Power Supplies

Figure 1. NXH160T120L2Q2F2SG Schematic Diagram

Table 1. ABSOLUTE MAXIMUM RATINGS (Note 1) T_J = 25°C unless otherwise noted

Rating	Symbol	Value	Unit
HALF BRIDGE IGBT			
Collector−Emitter Voltage			

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Rating	Symbol	Value	Unit
NEUTRAL POINT INVERSE DIODE			
Maximum Operating Junction Temperature	T_{JMAX}	150	°C
THERMAL PROPERTIES			
Storage Temperature range	T_{stg}	−40 to 125	°C
INSULATION PROPERTIES			
Isolation test voltage, t = 1 sec, 60Hz	V_{is}	3000	V_{RMS}
Creepage distance		12.7	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		

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

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
NEUTRAL POINT FREEWHEEL DIODE CHARACTERISTICS						
Diode Reverse Leakage Current	V_R = 600 V	I_R	–	–	100	μA
Diode Forward Voltage	I_F = 120 A, T_J = 25°C	V_F	–	1.24	1.5	V
	I_F = 120 A, T_J = 150°C		–	1.20	–	
Reverse Recovery Time	T_J = 25°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	t_{rr}	–	50	–	ns
Reverse Recovery Charge		Q_{rr}	–	1700	–	nC
Peak Reverse Recovery Current		I_{RRM}	–	59	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	2500	–	A/μs
Reverse Recovery Energy		E_{rr}	–	380	–	μJ
Reverse Recovery Time	T_J = 125°C V_{CE} = 350 V, I_C = 100 A V_{GE} = ±15 V, R_G = 4 Ω	t_{rr}	–	77	–	ns
Reverse Recovery Charge		Q_{rr}	–	3600	–	nC
Peak Reverse Recovery Current		I_{RRM}	–	77	–	A
Peak Rate of Fall of Recovery Current		di/dt	–	1900	–	A/μs
Reverse Recovery Energy		E_{rr}	–	780	–	μJ
Thermal Resistance − chip−to−heatsink	Thermal grease, Thickness < 100 μm, λ = 0.84 W/mK	R_{thJH}	–	0.48	–	°C/W
NEUTRAL POINT IGBT CHARACTERISTICS						
Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 600 V	I_{CES}	–	–	300	

TYPICAL CHARACTERISTICS – Half Bridge IGBT and Neutral Point Diode

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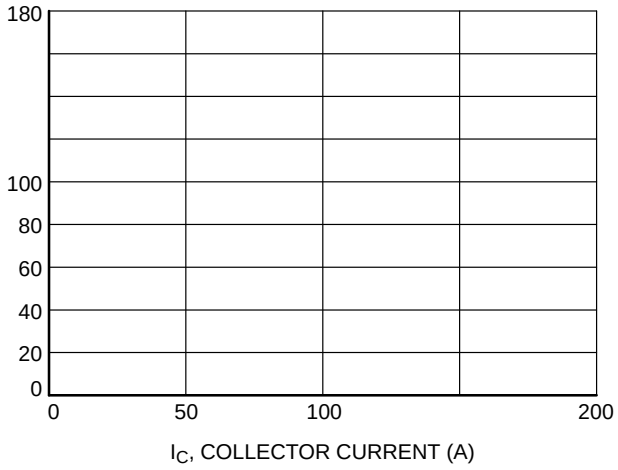


Figure 23. Typical Turn Off Time vs. IC

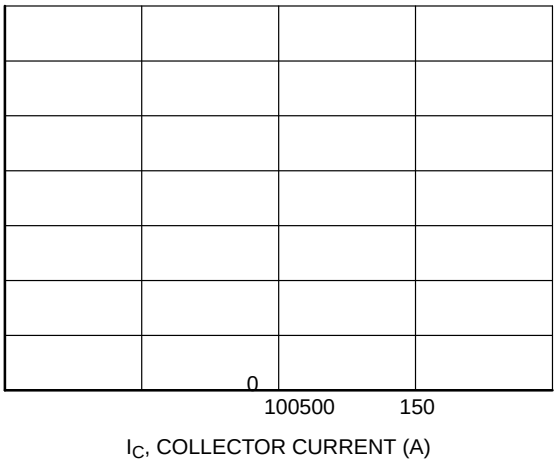
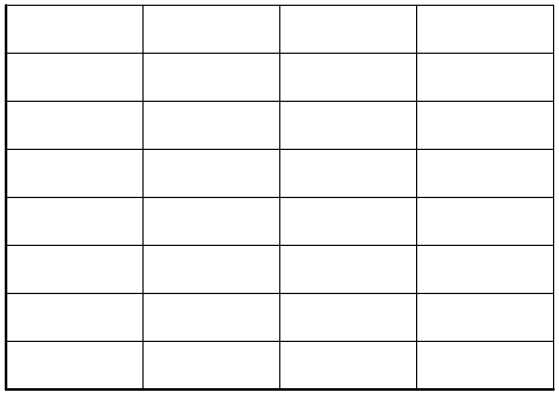
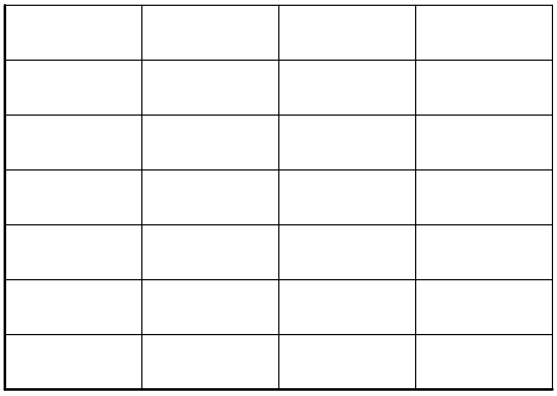
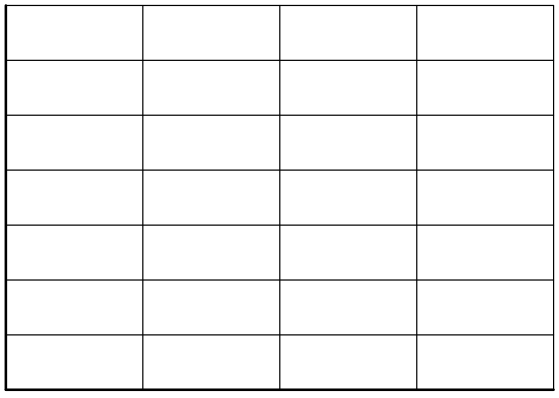
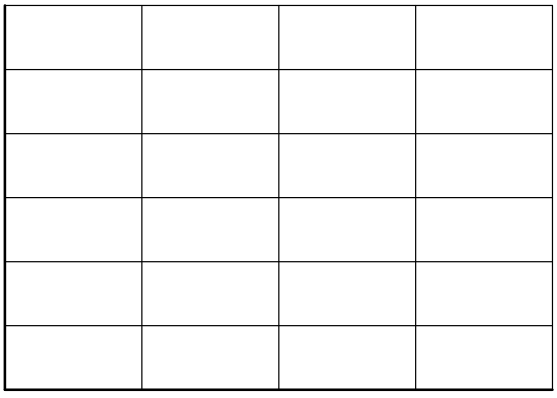


Figure 24. Typical Turn On Time vs. IC









TYPICAL CHARACTERISTICS – Half Bridge IGBT Protection Diode

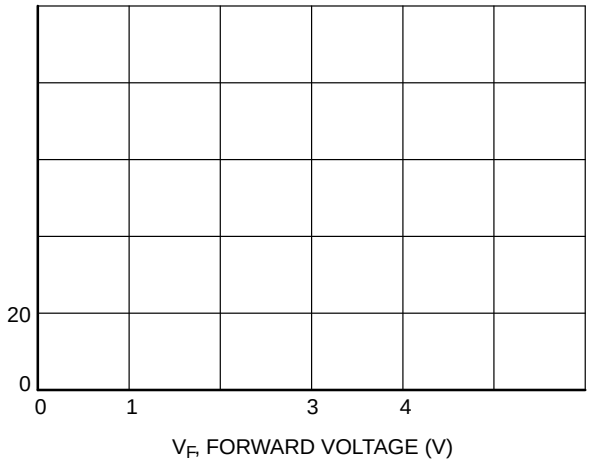
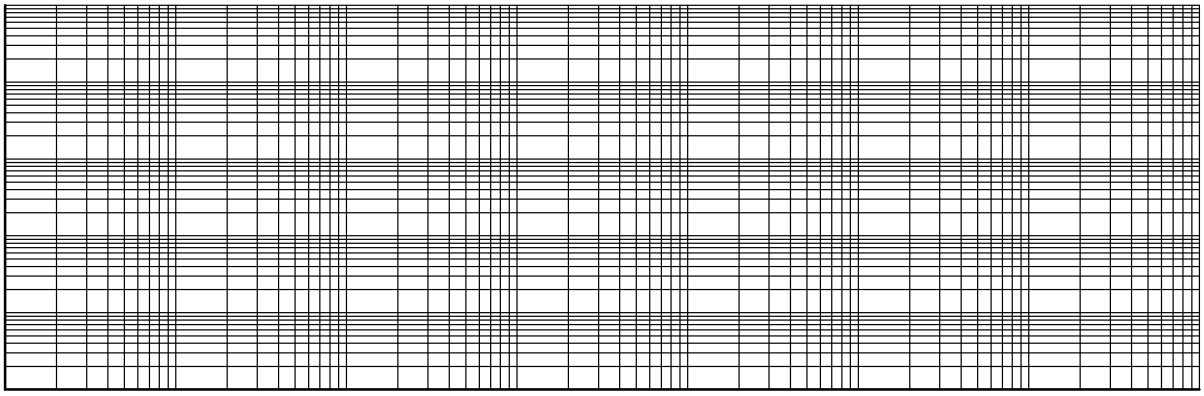
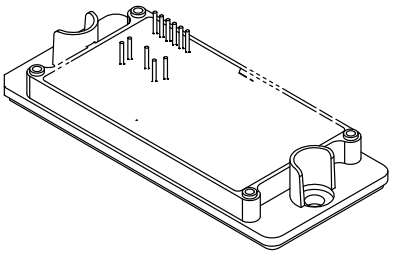


Figure 33. Diode Forward Characteristic





PIM56, 93x47 (SOLDER PIN)