

NXH80T120L2Q0PG, NXH80T120L2Q0SG

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit	
HALF BRIDGE IGBT CHARACTERISTICS							
Collector-emitter saturation voltage	V _{GE} = 15 V, I _C = 80 A, T _J = 25°C V _{GE} = 15 V, I _C = 80 A, T _J = 150°C	V _{CE(sat)}	1.7	2.17 2.20	2.7	V	
Gate-emitter threshold voltage	V _{GE} = V _{CE} , I _C = 1.5 mA	V _{GE(TH)}	5.0	6.0	6.5	V	
Collector-emitter cutoff current	V _{GE} = 0 V, V _{CE} = 1200 V	I _{CES}	–	–	200	μA	
Gate leakage current	V _{GE} = 20 V, V _{CE} = 0 V	I _{GES}	–	–	1.2	μA	
Turn-on delay time	T _J = 25°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{d(on)}	–	35	–	ns	
Rise time		t _r	–	28	–		
Turn-off delay time		t _{d(off)}	–	280	–		
Fall time		t _f	–	28	–		
Turn on switching loss		E _{on}	–	0.670	–		mJ
Turn off switching loss		E _{off}	–	1.3	–		
Turn-on delay time	T _J = 150°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{d(on)}	–	80	–	ns	
Rise time		t _r	–	30	–		
Turn-off delay time		t _{d(off)}	–	320	–		
Fall time		t _f	–	230	–		
Turn on switching loss		E _{on}	–	0.975	–		mJ
Turn off switching loss		E _{off}	–	3.00	–		
Input capacitance	V _{CE} = 20 V, V _{GE} = 0 V, f = 10 KHz	C _{ies}	–	19940	–	pF	
Output capacitance		C _{oes}	–	592	–		
Reverse transfer capacitance		C _{res}	–	383	–		
Gate charge total	V _{CE} = 960 V, I _C = 40 A, V _{GE} = ±15 V	Q _g	–	840	–	nC	
Thermal Resistance, chip-to-heatsink	Thermal grease thickness ≤ 50 μm λ = 1 W/mK	R _{θJH}		0.65		°C/W	

HALF BRIDGE DIODE CHARACTERISTICS

Forward voltage	V _{GE} = 0 V, I _F = 50 A, T _J = 25°C V _{GE} = 0 V, I _F = 50 A, T _J = 150°C	V _F	–	1.81 1.90	2.4	V
Reverse recovery time	T _J = 25°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{rr}	–	0.12	–	μs
Reverse recovery charge		Q _{rr}	–	4.7	–	μC
Peak reverse recovery current		I _{rrm}	–	135	–	A
Peak rate of fall of recovery current		di/dt _{max}	–	7200	–	A/μs
Reverse recovery energy		E _{rr}	–	1.37	–	mJ
Reverse recovery time	T _J = 150°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{rr}	–	0.14	–	μs
Reverse recovery charge		Q _{rr}	–	7.65	–	μC
Peak reverse recovery current		I _{rrm}	–	138	–	A
Peak rate of fall of recovery current		di/dt _{max}	–	4900	–	A/μs
Reverse recovery energy		E _{rr}	–	2.15	–	mJ
Thermal Resistance, chip-to-heatsink	Thermal grease thickness ≤ 50 μm λ = 1 W/mK	R _{θJH}		1.38		°C/W

NEUTRAL POINT CLAMP IGBT CHARACTERISTICS

Collector-emitter saturation voltage	V _{GE} = 15 V, I _C = 30 A, T _J = 25°C V _{GE} = 15 V, I _C = 30 A, T _J = 150°C	V _{CE(sat)}	1.1	1.3 1.3	1.6	V
Gate-emitter threshold voltage	V _{GE} = V _{CE} , I _C = 1.2 mA	V _{GE(TH)}	5.0	5.7	6.5	V
Collector-emitter cutoff current	V _{GE} = 0 V, V _{CE} = 600 V	I _{CES}	–	–	100	μA
Gate leakage current	V _{GE} = 20 V, V _{CE} = 0 V	I _{GES}	–	–	0.60	μA

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ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

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NEUTRAL POINT CLAMP IGBT CHARACTERISTICS						
Turn-on delay time	T _J = 25°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{d(on)}	–	46	–	ns
Rise time		t _r	–	16	–	
Turn-off delay time		t _{d(off)}	–	125	–	
Fall time		t _f	–	60	–	
Turn on switching loss		E _{on}	–	0.668	–	mJ
Turn off switching loss		E _{off}	–	0.76	–	
Turn-on delay time	T _J = 150°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{d(on)}	–	48	–	ns
Rise time		t _r	–	22	–	
Turn-off delay time		t _{d(off)}	–	200	–	
Fall time		t _f	–	134	–	
Turn on switching loss		E _{on}	–	1.1	–	mJ
Turn off switching loss		E _{off}	–	2.5	–	
Input capacitance	V _{CE} = 20 V, V _{GE} = 0 V, f = 10 KHz	C _{ies}	–	9900	–	pF
Output capacitance		C _{oes}	–	270	–	
Reverse transfer capacitance		C _{res}	–	270	–	
Gate charge total	V _{CE} = 480 V, I _C = 75 A, V _{GE} = ±15 V	Q _G	–	390	–	nC
Thermal Resistance, chip-to-heatsink	Thermal grease thickness ≤ 50 μm λ = 1 W/mK	R _{θJH}		1.35		°C/W

NEUTRAL POINT CLAMP DIODE CHARACTERISTICS

Forward voltage	V _{GE} = 0 V, I _F = 60 A, T _J = 25°C V _{GE} = 0 V, I _F = 60 A, T _J = 150°C	V _F	–	1.7 1.8	2.0 –	V
Reverse recovery time	T _J = 25°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{rr}	–	0.04	–	μs
Reverse recovery charge		Q _{rr}	–	1.1	–	μC
Peak reverse recovery current		I _{rrm}	–	65	–	A
Peak rate of fall of recovery current		di/dt _{max}	–	6600	–	A/μs
Reverse recovery energy		E _{rr}	–	0.384	–	mJ
Reverse recovery time		T _J = 150°C V _{CE} = 350 V, I _C = 56 A V _{GE} = ±15 V, R _G = 4 Ω	t _{rr}	–	0.1	–
Reverse recovery charge	Q _{rr}		–	3.3	–	μC
Peak reverse recovery current	I _{rrm}		–	68	–	A
Peak rate of fall of recovery current	di/dt _{max}		–	1733	–	A/μs
Reverse recovery energy	E _{rr}		–	0.74	–	mJ
Thermal Resistance, chip-to-heatsink	Thermal grease thickness ≤ 50 μm λ = 1 W/mK		R _{θJH}		1.86	

THERMISTOR CHARACTERISTICS

Normal resistance		R		22		kΩ
Nominal resistance	T = 100°C	R		1468		Ω
Deviation of R25		ΔR/R	–5		5	%
Power dissipation		P _D		200		mW
Power dissipation constant				2		mW/K
B-value	B(25/50), tol ±3%				3950	K
B-value	B(25/100), tol ±3%				3998	K
NTC reference					B	

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.