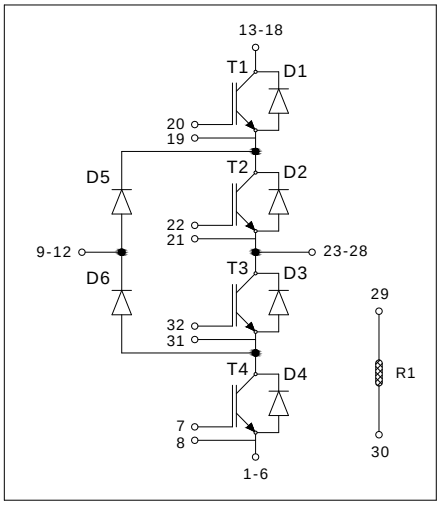
PRELIMINARY DATASHEET

Three Level Inverter Power Module
Trench + Field Stop IGBT



FEATURES

- Low voltage drop
- Low tail current
- Very tight parameter distribution
- High ruggedness, temperature stability
- Very soft, fast recovery anti-parallel diode
- Pb-free finished; **RoHS compliant**

MAXIMUM RATINGS (IGBT), at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Value	Units
Collector-emitter voltage	V_{CE}	600	V
DC collector current, limited by T_{jmax} T_C= 80°C	I_C	100	A
Pulsed collector current, t_p limited by T_{jmax}	I_{Cpulse}	200	
Gate-emitter voltage	V_{GE}	± 20	V
Power dissipation T_C = 25°C	P_D	335	W
Thermal resistance, junction to case	R_{thJC}	0.45	K/W

ELECTRICAL CHARACTERISTICS (IGBT), at T_j = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Collector-emitter saturation voltage T_j = 25°C T_j = 150°C	$V_{CE(sat)}$	V_{GE} = 15V, I_C = 100A	 - -	 1.45 1.70	 1.9 -	V
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 1.6mA, V_{CE} = V_{GE}	4.9	5.8	6.5	V
Zero gate voltage collector current	I_{CES}	V_{CE} = 600V, V_{GE} = 0	-	-	1.0	mA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = 20V	-	-	100	nA
Input capacitance	C_{iss}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	6200	-	pF
Output capacitance	C_{oss}		-	384	-	
Reverse transfer capacitance	C_{rss}		-	190	-	
Gate charge	Q_{Gate}	V_{GE} = 15V	-	1000	-	nC
Turn-on delay time (inductive load) T_j = 25°C T_j = 150°C	$t_{d(on)}$	V_{CE}=300V, I_C=100A, V_{GE}= ±15V, R_G=24Ω	 - -	 100 100	 - -	ns
Rise time (inductive load) T_j = 25°C T_j = 150°C	t_r		 - -	 60 70	 - -	
Turn-off delay time (inductive load) T_j = 25°C T_j = 150°C	$t_{d(off)}$		 - -	 600 700	 - -	
Fall time T_j = 25°C T_j = 150°C	t_f	V_{CE} = 300V, I_C =100A, V_{GE} = ±15V, R_G =24Ω	 - -	 70 120	 - -	ns

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Turn-on energy T_j = 25°C T_j = 150°C	E_{on}	V_{CE}=300V, I_C=100A, V_{GE}= ±15V, R_G =24Ω, L_S = 30nH	- -	4.85 6.00	- -	mJ
Turn-off energy T_j = 25°C T_j = 150°C	E_{off}		- -	3.70 4.60	- -	

DIODE Maximum Ratings (D1 to D4)

Parameter	Symbol	Value	Units
Repetitive peak reverse voltage, T_j = 25°C	V_{RRM}	600	V
Diode forward current	I_F	75	A
Repetitive peak forward current, tp = 1 ms	I_{FRM}	150	
Thermal resistance, junction to case	R_{thJC}	0.95	K/W

DIODE Electrical Characteristics (D1 to D4)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward voltage T_j = 25°C T_j = 150°C	V_F	V_{GE} = 0 V, I_F = 75A	- -	1.55 1.45	1.95 -	V
Peak reverse recovery current T_j = 25°C T_j = 150°C	I_{RM}	I_F = 75A, -di/dt = 1200A/µs V_R = 300V, V_{GE} = -15V	- -	38.0 51.0	- -	A
Reverse recovery charge T_j = 25°C T_j = 150°C	Q_{rr}	I_F = 75A, -di/ dt = 1200A/µs V_R = 300V, V_{GE} = -15V	- -	2300 5600	- -	nC
Reverse recovery energy T_j = 25°C T_j = 150°C	E_{rec}	I_F = 75A, -di/dt = 1200A/µs V_R = 300V, V_{GE} = -15V	- -	0.35 1.00	- -	mJ

DIODE Maximum Ratings (D5 and D6)

Parameter	Symbol	Value	Units
Repetitive peak reverse voltage, T_j = 25°C	V_{RRM}	600	V
Diode forward current	I_F	100	A
Repetitive peak forward current, tp = 1 ms	I_{FRM}	200	
Thermal resistance, junction to case	R_{thJC}	0.80	K/W

DIODE Electrical Characteristics (D5 and D6)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward voltage T_j = 25°C T_j = 150°C	V_F	V_{GE} = 0 V, I_F = 100A	- -	1.55 1.45	1.95 -	V
Peak reverse recovery current T_j = 25°C T_j = 150°C	I_{RM}	I_F = 100A, -di/dt = 1300A/µs V_R = 300V, V_{GE} = -15V	- -	50.0 65.0	- -	A
Reverse recovery charge T_j = 25°C T_j = 150°C	Q_{rr}	I_F = 100A, $-d_{IF}/d_T$ = 1300A/µs, V_R = 300V, V_{GE} = -15V	- -	3000 7500	- -	nC
Reverse recovery energy T_j = 25°C T_j = 150°C	E_{rec}	I_F = 100A, -di/dt = 1300A/µs, V_R = 300V, V_{GE} = -15V	- -	0.50 1.30	- -	mJ

NTC Thermistor Characteristics

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Resistance at 25°C	R_{25}	-	33	-	kΩ
Deviation at R_{100}	ΔR/R	-	3	-	%
B-value	$B_{25/85}$	-	3980	-	K

Thermal and Isolation Characteristics

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Operating junction temperature	T_J	- 40	-	175	°C
Storage temperature range	T_{STG}	- 40	-	125	
Operating case temperature	T_C	- 40	-	100	
RMS Isolation voltage, terminal to case, 1-3 seconds, 50/ 60 Hz	V_{iso}	3000	-	-	V

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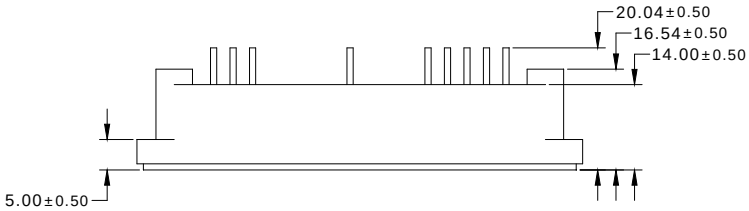
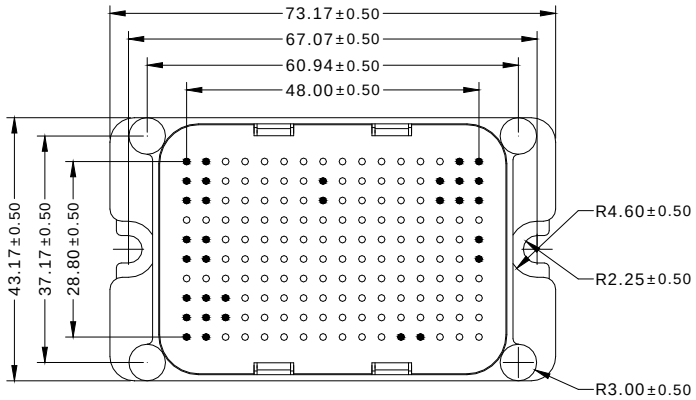
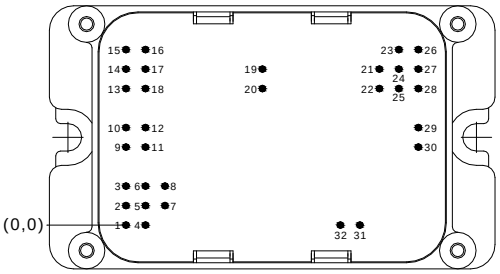
Package Outline Drawing





PIN LAYOUT					
PIN	X	Y	PIN	X	Y
1	0	0	18	3.20	22.40
2	0	3.20	19	22.40	25.60
3	0	6.40	20	22.40	22.40
4	3.20	0	21	41.60	25.60
5	3.20	3.20	22	41.60	22.40
6	3.20	6.40	23	44.80	28.80
7	6.40	3.20	24	44.80	25.60
8	6.40	6.40	25	44.80	22.40
9	0	12.80	26	48.00	28.80
10	0	16.00	27	48.00	25.60
11	3.20	12.80	28	48.00	22.40
12	3.20	16.00	29	48.00	16.00
13	0	22.40	30	48.00	12.80
14	0	25.60	31	38.40	0
15	0	28.80	32	35.20	0
16	3.20	28.80			
17	3.20	25.60			



CAUTION: These devices are ESD sensitive. Use proper handling procedure.

Disclaimer

These specifications may not be considered as a guarantee of components characteristics. Components have to be tested depending on intended application as adjustments may be necessary. The use of **iQXPRZ Power Inc.** components in life support appliances and systems are subject to written approval of **iQXPRZ Power Inc.**

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