

PS51277-A

TRANSFER-MOLD TYPE
INSULATED TYPE

MAXIMUM RATINGS (Tj = 25°C, unless otherwise noted)

MAIN CIRCUIT PART

Symbol	Parameter	Conditions	Ratings	Unit
Vi	Supply Voltage	Applied between : S-R	264	Vrms
Vi(surge)	Supply Voltage (surge)	Applied between : S-R, Surge value, Non-operating	500	V
Vo	Output Voltage	Applied between : P-N	450	V
VO(surge)	Output Voltage (surge)	Applied between : P-N, Surge value, Non-operating	500	V
VCEs	Collector-Emitter Voltage	—	600	V
VRRM	Repetitive Peak Reverse Voltage	—	600	V
Ii	Input Current (100% Load)	Tc ≤ +90°C, Vi = 200V, Vo = 300V, fPWM = 20kHz	15	Arms
Ii(125%)	Input Current (125% Load)	Tc ≤ +90°C, Vi = 200V, Vo = 300V, fPWM = 20kHz, 1 min Non-repetitive	18.7	Arms
I ² t	I ² t for Fu sing	Value for 1msec of Surge Current	75	A ² s
Tj	Junction Temperature	(Note 1)	-20~+125	°C

Note 1 : The maximum junction temperature rating of the power chips integrated within the DIP-PFC is 150°C (@ Tc ≤ 100°C) however, to ensure safe operation of the DIP-PFC, the average junction temperature should be limited to Tj(ave) ≤ 125°C (@ Tc ≤ 100°C).

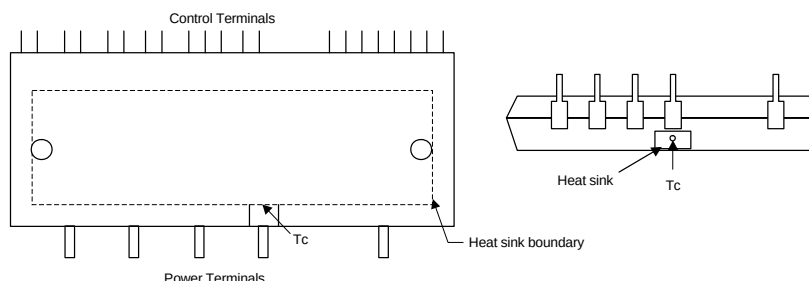
CONTROL (PROTECTION) PART

Symbol	Parameter	Condition	Ratings	Unit
Vd	Control supply voltage	Applied between : Vd-GND	20	V
VIN	Control input voltage	Applied between : VIN-GND	0~Vd+0.5	V

TOTAL SYSTEM

Symbol	Parameter	Condition	Ratings	Unit
Tc	Module case operation temperature	(Note 2)	-20~+100	°C
Tstg	Storage temperature		-40~+125	°C
Viso	Isolation voltage	60Hz, Sinusoidal, AC 1 minute, connection pins to heat-sink plate	1500	Vrms

Note 2 : Tc MEASUREMENT POINT



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THERMAL RESISTANCE

Symbol	Parameter	Condition	Limits			Unit
			Min.	Typ.	Max.	
R _{th(j-c)Q}	Junction to case thermal resistance	Inverter IGBT part	—	—	2.05	°C/W
R _{th(j-c)F}		Inverter FWDi part	—	—	2.50	°C/W
R _{th(c-f)}	Contact thermal resistance	Case to fin, (per 1 module) thermal grease applied	—	—	0.067	°C/W

ELECTRICAL CHARACTERISTICS (T_j = 25°C, unless otherwise noted)

INVERTER PART

Symbol	Parameter	Condition	Limits			Unit
			Min.	Typ.	Max.	
V _{CE(sat)}	Collector-emitter saturation voltage	V _D = 15V, V _{IN} = 5V, I _C = 30A	—	2.0	2.6	V
V _F	Forward voltage	I _F = 30A	—	1.6	2.2	V
t _{on}	Switching times	V _{CC} = 300V, V _D = 15V I _C = 20A, T _j = 125°C, V _{IN} = 5V ↔ 0V Inductive load	—	0.23	—	μs
t _{rr}			—	0.14	—	μs
t _{c(on)}			—	0.14	—	μs
t _{off}			—	0.43	—	μs
t _{c(off)}			—	0.23	—	μs
I _{CEs}	Collector-emitter cut-off current	V _{CE} = 600V	T _j = 25°C		1	mA
			T _j = 125°C		10	
I _R	Reverse current	V _R = 600V	T _j = 25°C		1	mA
			T _j = 125°C		10	
I _{rr}	FWDi reverse recovery current	V _{CC} = 300V, V _D = 15V, I _C = 20A, T _j = 25°C	—	13	—	A

CONTROL (PROTECTION) PART

Symbol	Parameter	Condition		Limits			Unit
				Min.	Typ.	Max.	
V _D	Control supply voltage	Applied between : V _D -GND		13.5	15.0	16.5	V
I _D	Circuit current	Applied between : V _D -GND	V _D = 15V, V _{IN} = 5V	—	0.8	3.0	mA
			V _D = 15V, V _{IN} = 0V	—	0.7	3.0	
I _{IN}	Control input current	V _D = 15V, V _{IN} = 5V		—	0.3	0.45	mA
V _{th(on)}	ON threshold voltage	Applied between : V _{IN} -GND		—	3.0	3.7	V
V _{th(off)}	OFF threshold voltage			1.3	2.0	—	V
UV _{Dt}	Supply circuit under-voltage protection	T _J ≤ 125°C	Trip level	10.3	—	12.5	V
UV _{Dr}			Reset level	10.8	—	13.0	V

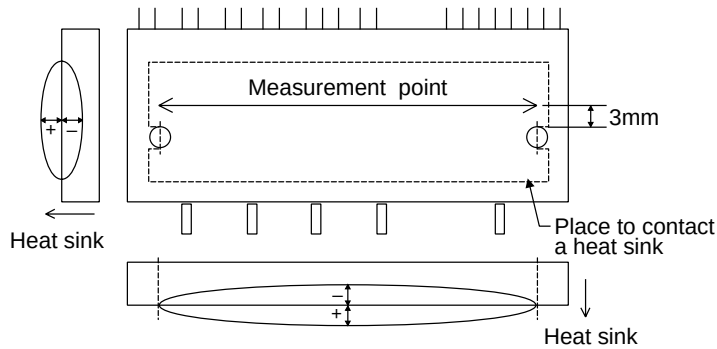
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MECHANICAL CHARACTERISTICS AND RATINGS

Symbol	Parameter	Condition	Limits			Unit
			Min.	Typ.	Max.	
—	Mounting torque	Mounting screw : M4	0.98	1.18	1.47	N·m
—	Weight		—	54	—	g
—	Heat-sink flatness	(Note 3)	-50	—	100	μm

Note 3: Measurement point of heat-sink flatness



RECOMMENDED OPERATION CONDITIONS

Symbol	Parameter	Condition	Limits			Unit
			Min.	Typ.	Max.	
V_i	Supply voltage	Applied between : S-R	90	—	264	Vrms
V_D	Control supply voltage	Applied between : V_D -GND	13.5	15.0	16.5	V
ΔV_D	Control supply variation		-1	—	1	V/μs
f_{PWM}	PWM input frequency	$T_c \leq 100^\circ\text{C}$, $T_j \leq 125^\circ\text{C}$	—	20	—	kHz
$V_{IN(on)}$	Input ON threshold voltage	Applied between : V_{IN} -GND	4.0~ V_D			V
$V_{IN(off)}$	Input OFF threshold voltage		0~1.0			V

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Fig. 2 THE DIP-PFC INTERNAL CIRCUIT

