

PS51277-A

TRANSFER-MOLD TYPE
INSULATED TYPE

MAXIMUM RATINGS ($T_j = 25^\circ\text{C}$, unless otherwise noted)

MAIN CIRCUIT PART

Symbol	Parameter	Conditions	Ratings	Unit
V_i	Supply Voltage	Applied between : S-R	264	V_{rms}
$V_{i(surge)}$	Supply Voltage (surge)	Applied between : S-R, Surge value, Non-operating	500	V
V_o	Output Voltage	Applied between : P-N	450	V
$V_{o(surge)}$	Output Voltage (surge)	Applied between : P-N, Surge value, Non-operating	500	V
V_{CES}	Collector-Emitter Voltage	—	600	V
V_{RRM}	Repetitive Peak Reverse Voltage	—	600	V
I_i	Input Current (100% Load)	$T_c \leq +90^\circ\text{C}$, $V_i = 200\text{V}$, $V_o = 300\text{V}$, $f_{PWM} = 20\text{kHz}$	15	A_{rms}
$I_i(125\%)$	Input Current (125% Load)	$T_c \leq +90^\circ\text{C}$, $V_i = 200\text{V}$, $V_o = 300\text{V}$, $f_{PWM} = 20\text{kHz}$, 1 min Non-repetitive	18.7	A_{rms}
I^2t	I^2t for Fu sing	Value for 1msec of Surge Current	75	A^2s
T_j	Junction Temperature	(Note 1)	$-20 \sim +125$	$^\circ\text{C}$

Note 1 : The maximum junction temperature rating of the power chips integrated within the DIP-PFC is 150°C (@ $T_c \leq 100^\circ\text{C}$) however, to ensure safe operation of the DIP-PFC, the average junction temperature should be limited to $T_{j(ave)} \leq 125^\circ\text{C}$ (@ $T_c \leq 100^\circ\text{C}$).

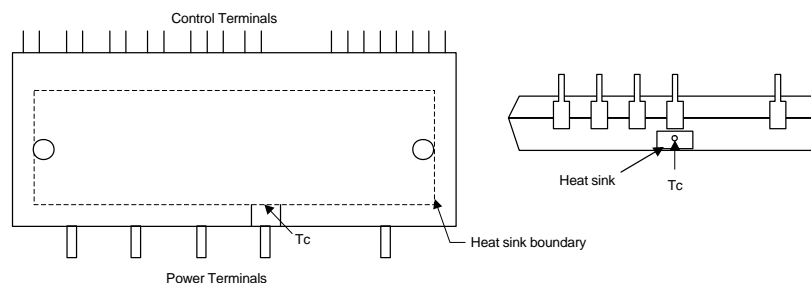
CONTROL (PROTECTION) PART

Symbol	Parameter	Condition	Ratings	Unit
V_D	Control supply voltage	Applied between : V_D -GND	20	V
V_{IN}	Control input voltage	Applied between : V_{IN} -GND	$0 \sim V_D + 0.5$	V

TOTAL SYSTEM

Symbol	Parameter	Condition	Ratings	Unit
T_c	Module case operation temperature	(Note 2)	$-20 \sim +100$	$^\circ\text{C}$
T_{stg}	Storage temperature		$-40 \sim +125$	$^\circ\text{C}$
V_{iso}	Isolation voltage	60Hz, Sinusoidal, AC 1 minute, connection pins to heat-sink plate	1500	V_{rms}

Note 2 : T_c 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
U _{VDt}	Supply circuit under-voltage protection	T _j ≤ 125°C	Trip level	10.3	—	12.5	V
U _{VDr}			Reset level	10.8	—	13.0	V

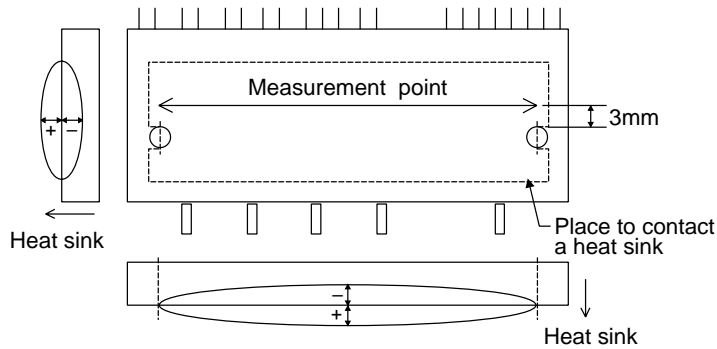
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MECHANICAL CHARACTERISTICS AND RATINGS

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

