



H11B1F Series

Rev.A.1.0

DESCRIPTION:

The products are 5-pin solid-state relay opto-couplers. The device combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon random-phase photo triac to drive a power triac in a plastic DIP5 package with different lead forming options. The products are widely used in solenoid/valve controls, lighting controls, motor controls, temperature controls, static AC power switches, solid state relays, interfacing microprocessors to 265 V_{AC} peripherals.

MAIN FEATURES

High isolation 5000 Vrms

DC input with triac output

Operating temperature range - 40°C to 110 °C

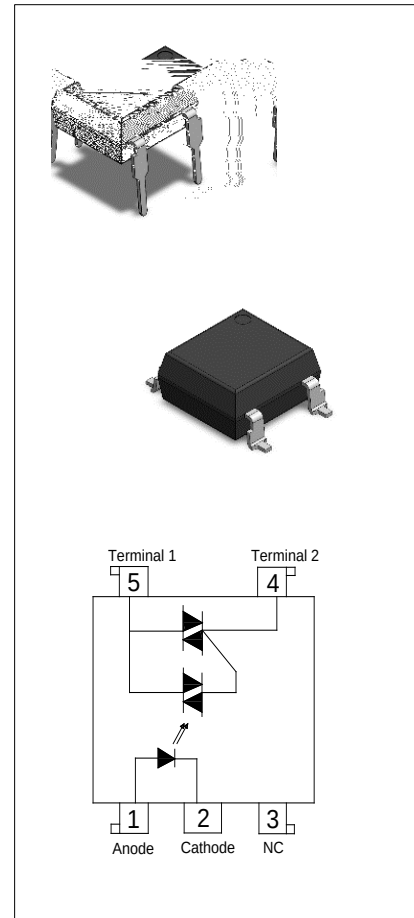
REACH & RoHS compliance

HBM: H3B; MM: M4; CDM: C3

CQC approved

VDE approved

UL approved



ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Parameter		Symbol	Value	Unit
Input	Forward Current	I _F	50	mA
	Peak Forward Current	I _{FP}	1 ^①	A
	Reverse Voltage	V _R	6	V
	Power Dissipation	P _D	75	mW
Output	Repetitive peak off-state voltage	V _{DRM}	600	V
	Repetitive peak reverse voltage	V _{RRM}	600	V
	Critical rate of rise of on-state current	di/dt	100	A/μs
	On-state RMS Current (T _a ≤43	I _{T(RMS)}	0.6	A
	Non repetitive surge peak on-state current (full cycle , t _p =20ms)	I _{TSM}	6	A
	junction to case (AC)	R _{th(j-c)}	65	°C/W
Isolation Voltage		V _{iso}	5000 ^②	Vrms

Operating Temperature	T_{opr}	-40~110	°C
Junction Temperature	T_j	125	°C
Storage Temperature	T_{stg}	-40~125	°C
Soldering Temperature	T_{sol}	260	°C
Peak pulse voltage ($T_j=25^{\circ}\text{C}$; non-repetitive, off-state)	V_{pp}	3	kV

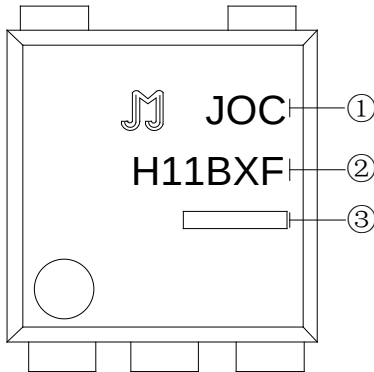
NOTE1 100 μs pulse, 100Hz frequency

NOTE2 AC for 1 minute, R.H.=40~60%

ELECTRICAL CHARACTERISTICS (Sample Temperature=25°C)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$I_F=10\text{mA}$	-	1.2	1.5	V
	Reverse Current	I_R	$V_R=6\text{V}$	-	-	1	μA
Output	Peak Off-state Current, Either Direction	I_{DRM}	V_{DRM} / V_{RRM} $=600\text{V}, I_F=0$	-	-	5	μA
		I_{RRM}		-	-	5	
	Peak On-state Voltage, Either Direction	V_{TM}	$I_{TM}=I_{TM}$ Rated	-	-	1.7	V
	Critical Rate of Rise of Off-state voltage	dV/dt	$V_D=400\text{V}$, Gate Open $I_F=0$, $T_j=125^{\circ}\text{C}$	1000	-	-	V/ μs
	Critical Rate of Rise of Commutating Voltage	$(dV/dt)_c$	$(dI/dt)_c$ $=1.5\text{A/ms}$, $T_j=125^{\circ}\text{C}$	10	-	-	V/ μs
Transfer Characteristics	LED Trigger Current	I_{FT}	Terminal Voltage=6V $R_L=100\Omega$	-	-	-	mA
	Holding Current	I_H	$V_D=6\text{V}$	-	-	25	mA
	Isolation Resistance	R_{ISO}	DC500V 40~60%R.H.	10^{12}	10^{14}	-	Ω
	Response Time	t_{on}	$V_D=6\text{V}$, $R_L=100\Omega$, $I_F=20\text{mA}$	-	20	100	μs

ORDERING AND MARKING INFORMATION

MARKING INFORMATION			
		① : Company Abbr. ② : Part Number & Rank ③ : Production Information Code	
Packing Quantity			
Option	Quantity	Quantity Inner box	Quantity Outer box
DIP	60 Units/Tube	40 Tubes/Inner box	5 Inner box/Outer box =12k Units
SMD	1200 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box =12k Units

Characteristics Curves

FIG.1: Max. Allowable LED Forward Current vs. Ambient Temperature

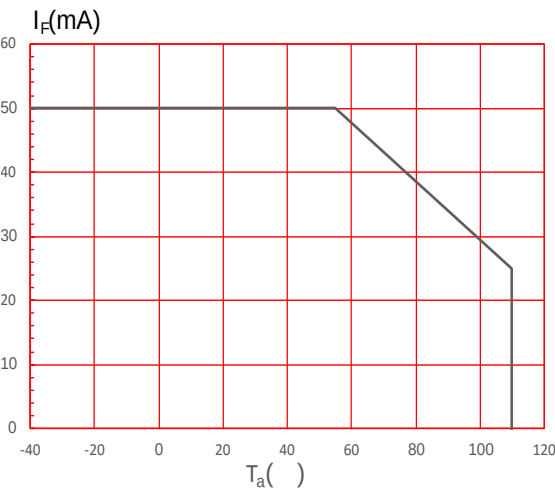


FIG.3:

FIG.2: On-state Terminal Current vs. Ambient Temperature

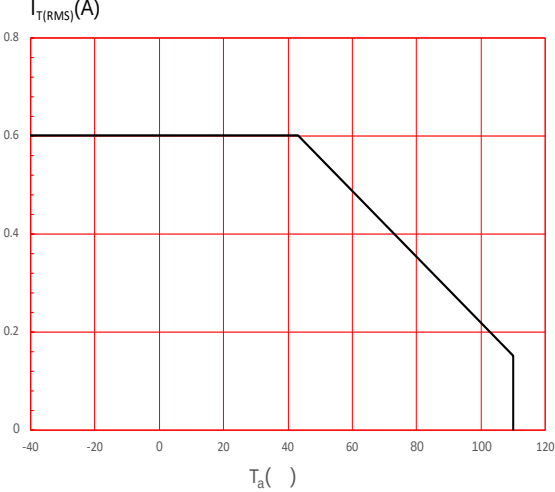


FIG.7: On-state characteristics

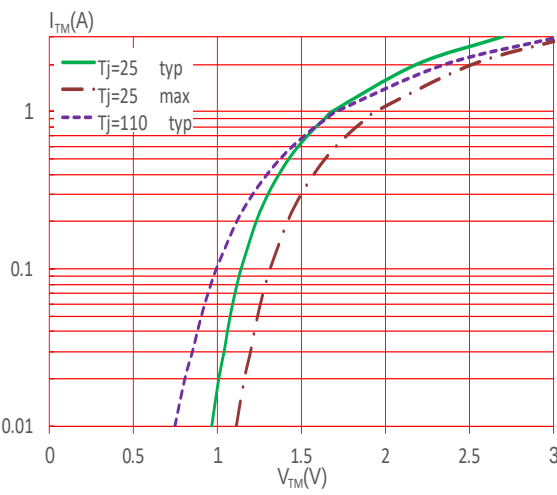
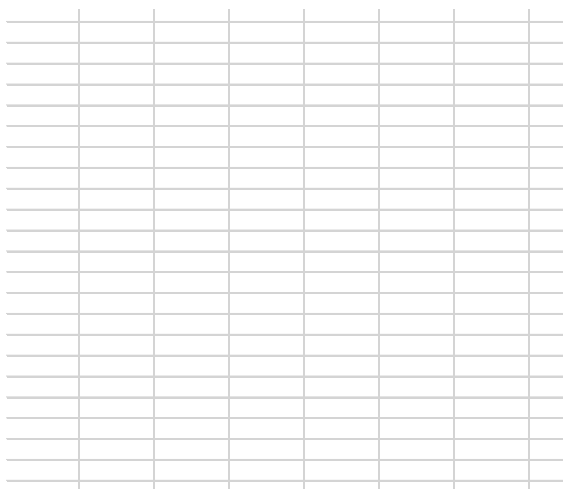


FIG.8: Normalized Holding Current vs. Ambient Temperature



TEST CIRCUITS

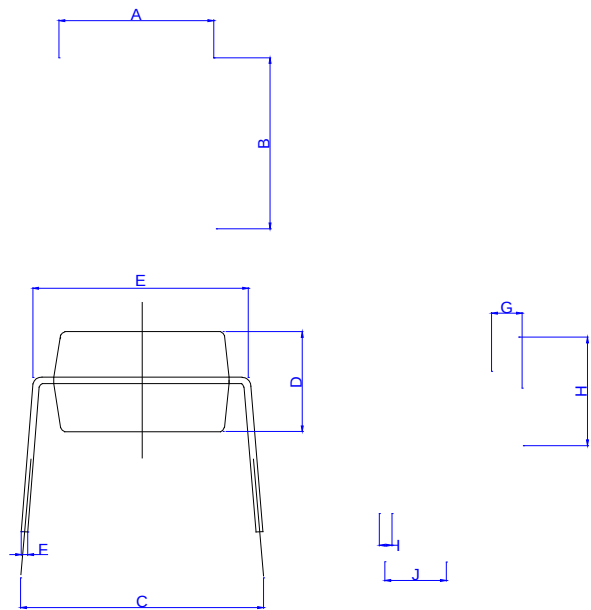
FIG.10: Test Circuits of Turn On Time

FIG.11: Waveforms of Turn On Time

FIG.12: Test circuit for inductive and resistive loads to IEC-61000-4-

Package Dimension (Unit:mm)

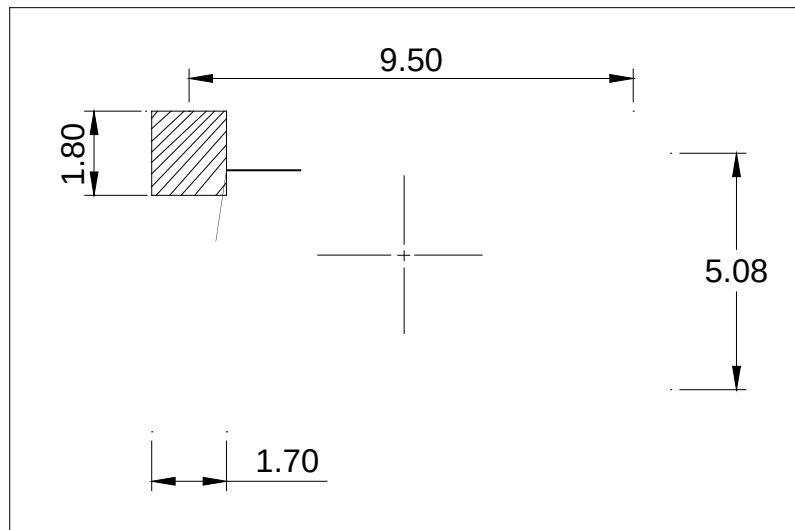
Standard DIP Type:



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A						
B						
C						
D						
E						
F						
G						
H						
I						
J						

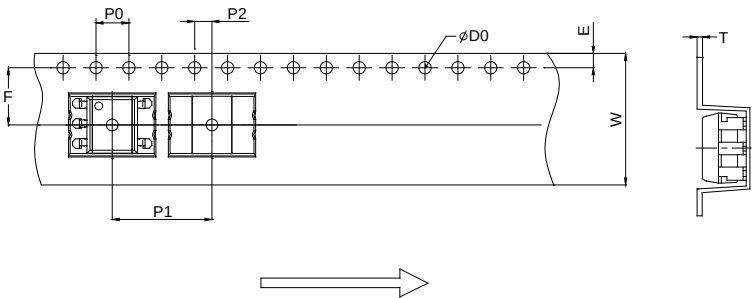
RECOMMENDED SOLDER MASK DIMENSIONS in mm unless otherwise stated)

Option SMD



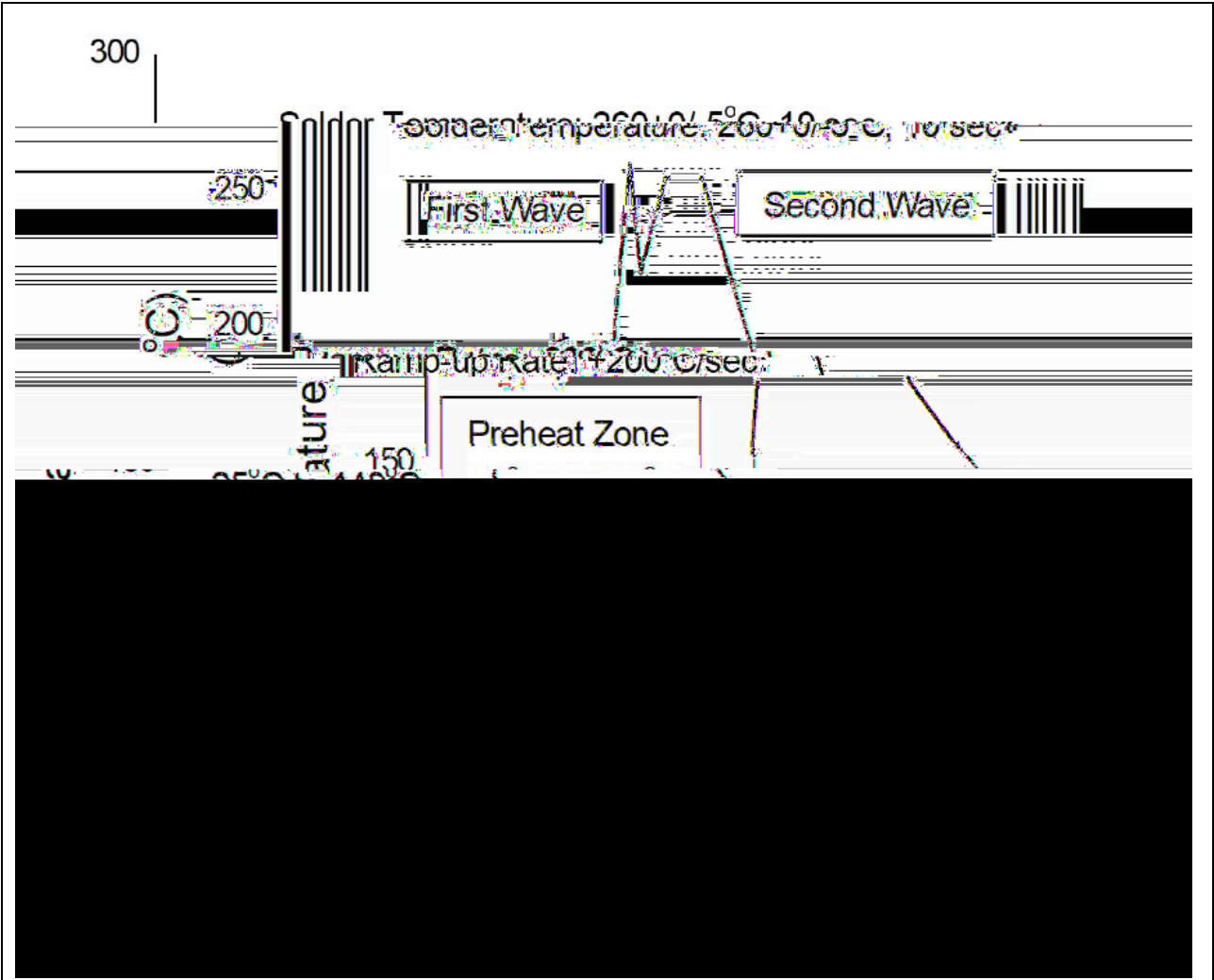
CARRIER TAPE SPECIFICATIONS Dimensions in mm unless otherwise stated

Option T3



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45	0.014	0.016	0.018
W	15.70	16.00	16.30	0.618	0.630	0.642

WAVE SOLDERING



HANDSOLDERING BY SOLDERING IRON	
Soldering Temperature	360 ± 5℃
Soldering Time	3s max.

Note:

1. Reflow soldering is recommended at the temperatures and times shown, no more than three times.
2. Avoid direct contact between the epoxy body and any tools or surfaces exceeding its maximum storage temperature.
3. Application of pressure on the epoxy body is prohibited at elevated temperatures. In specific scenarios, any applied force must not exceed 2.5N.
4. Ensure the component has cooled to ambient temperature before proceeding with any subsequent manufacturing steps.
5. The component has a shelf life of one year when stored under standard conditions.
6. Recommend storage Temp.: 0~40℃;
Recommend storage humidity: <60%;
MSL level: MSL 1

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