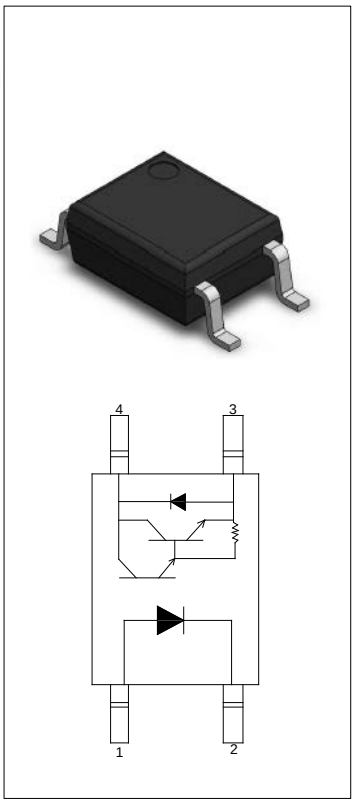
JOC352X Series

Rev.A.1.0

DESCRIPTION:

The products are Darlington transistor opto-couplers in a plastic SOP4 package. The device combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector. With the robust coplanar double mold structure, the device provides the most stable isolation feature. The products are widely used in switch mode power supplies, programmable controllers, household appliances and office equipment.



MAIN FEATURES

High isolation 3750 VRMS
Operating temperature range -55°C to 110°C
RoHS & REACH Compliance
HBM: H3A; MM: M4; CDM: C3
CQC approved
VDE approved
UL approved

ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current	I_{FP}	1①	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	75	mW
Output	Collector-emitter Voltage	V_{CEO}	300	V
	Emitter-collector Voltage	V_{ECO}	0.3	V
	Collector Current	I_C	150	mA
	Power Dissipation	P_C	150	mW
Total Power Dissipation		P_{tot}	225	mW
Isolation Voltage		V_{iso}	3750②	Vrms
Operating Temperature		T_{opr}	-55~+110	℃
Junction Temperature		T_j	125	℃

Storage Temperature	T_{stg}	-55~+125	℃
Soldering Temperature	T_{sol}	260	℃

NOTE1: 100μs pulse, 100Hz frequency
NOTE2: AC for 1minute, R.H.=40~60%

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

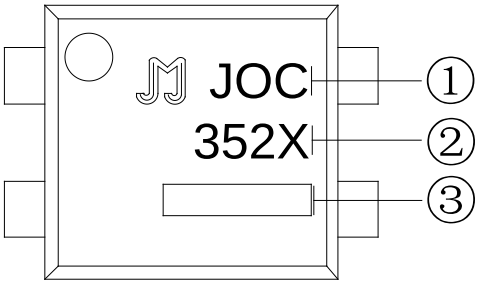
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F=10mA	-	1.2	1.5	V
	Reverse Current	I_R	V_R=6V	-	-	1	μA
	Terminal Capacitance	C_t	V=0, f=1MHz	-	10	-	pF
Output	Collector-Emitter dark current	I_{CEO}	V_{CE}=200V, I_F=0	-	-	200	nA
	Collector-Emitter breakdown voltage	BV_{CEO}	I_C=0.1mA I_F=0	300	-	-	V
	Emitter-Collector breakdown voltage	BV_{ECO}	I_E=0.1mA I_F=0	0.3	-	-	V
Transfer Characteristics	Current transfer ratio	CTR①	I_F=1mA V_{CE}=2V	1000	-	7500	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F=1mA I_C=10mA	-	-	1	V
	Isolation resistance	R_{IO}	DC500V 40~60%R.H.	10^{12}	-	-	Ω
	Floating Capacitance	C_{IO}	V=0, f=1MHz	-	0.8	-	pF
	Rise Time	t_r	V_{CE}=10V, I_C=10mA R_L=100Ω	-	40	-	μs
	Fall Time	t_f		-	15	-	μs
	Response Time	t_{on}		-	50	-	μs
		t_{off}		-	15	-	μs

NOTE1: Rank Table of Current Transfer Ratio (Temperature=25°C)

Grade Sign	Test Condition	Min. (%)	Max. (%)
J	I_F=140μA, V_{CE}=2V	-	110
	I_F=290μA, V_{CE}=2V	450	-
	I_F=1mA, V_{CE}=2V	1000	7500
K	I_F=1mA, V_{CE}=2V	1000	7500
L	I_F=1mA, V_{CE}=1V	2000	7500

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
SOP4	3000 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box =30k Units

Characteristics Curves

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

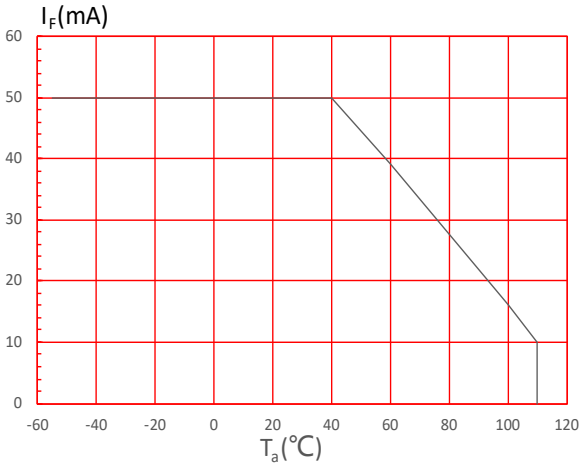


FIG.2: Collector Power Dissipation vs. Ambient Temperature

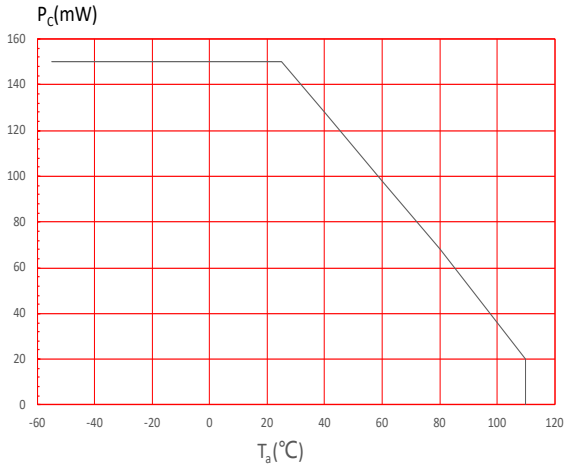


FIG.3: Forward Current vs. Forward Voltage

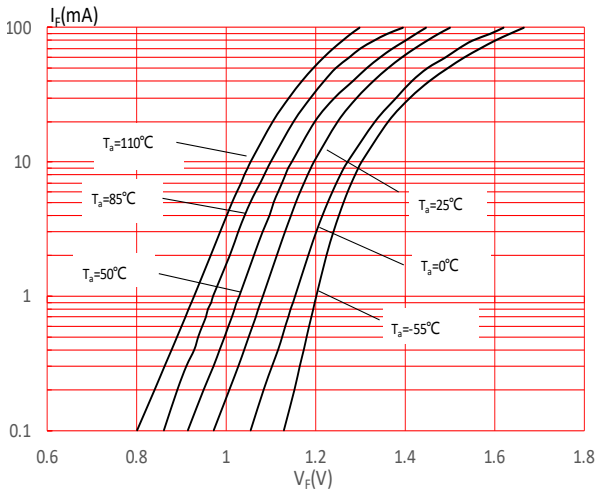
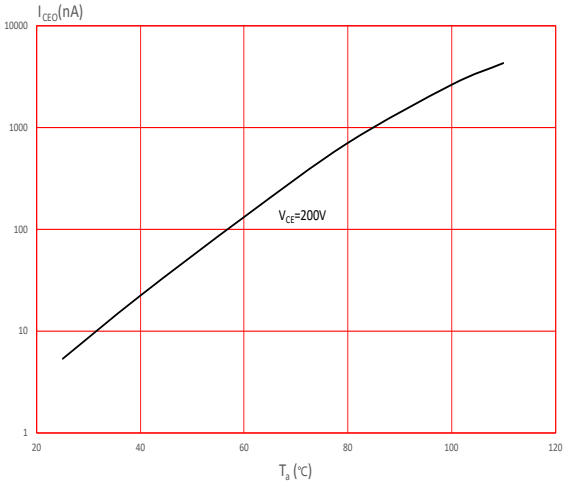


FIG.4: Collector Dark Current vs. Ambient Temperature



Test Circuits

FIG.5: Test Circuits of Propagation Delay Time

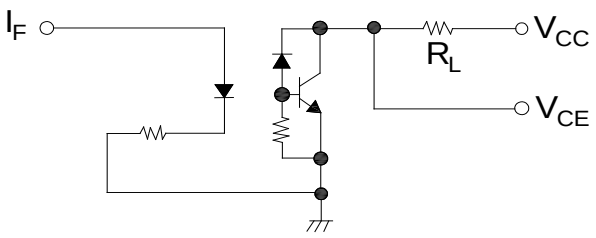
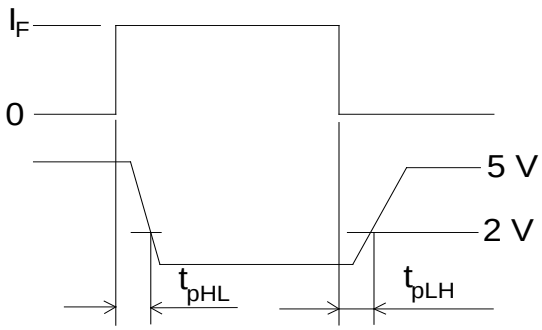
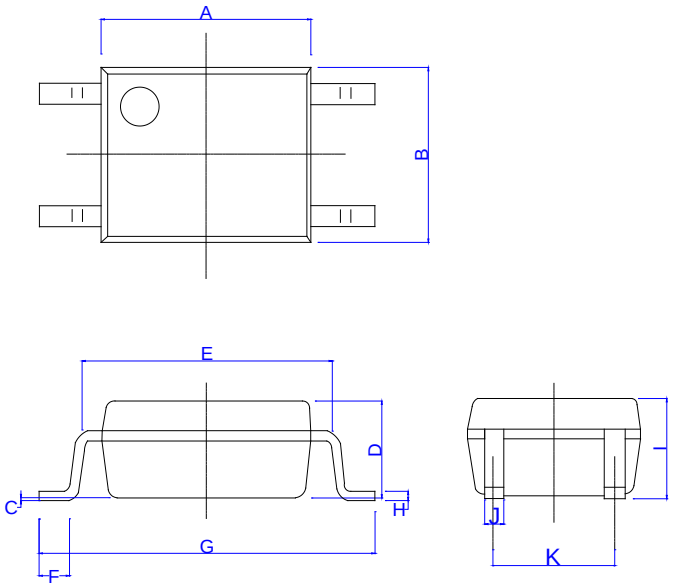


FIG.6: Curves of Propagation Delay Time

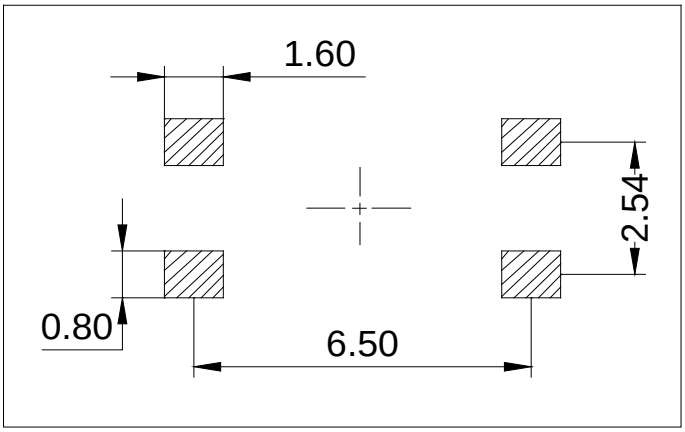


Package Dimension (Unit: mm)



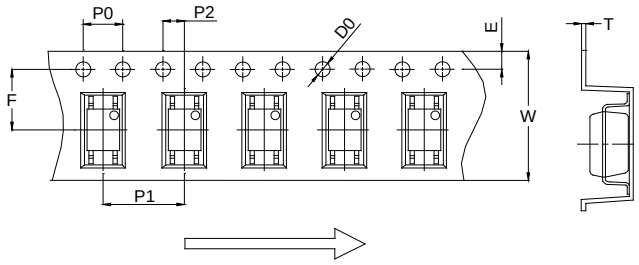
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.80	0.173		0.189
B	3.60		4.20	0.142		0.165
C	0.00		0.20	0.000		0.008
D	1.90		2.30	0.075		0.091
E	5.00		5.60	0.197		0.220
F	0.34		0.94	0.013		0.037
G	6.70		7.30	0.264		0.287
H	0.10		0.30	0.004		0.012
I	2.00		2.40	0.079		0.094
J	0.25		0.55	0.010		0.022
K	2.29		2.79	0.090		0.110

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



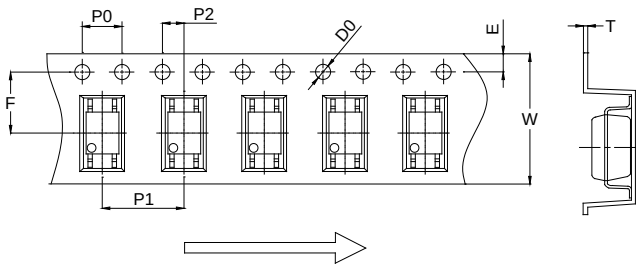
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option T1



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	7.90	8.00	8.10	0.311	0.315	0.319
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	4.40	4.50	4.60	0.173	0.177	0.181
T	0.25	0.30	0.35	0.010	0.012	0.014
W	11.90	12.00	12.30	0.469	0.472	0.484

Option T2



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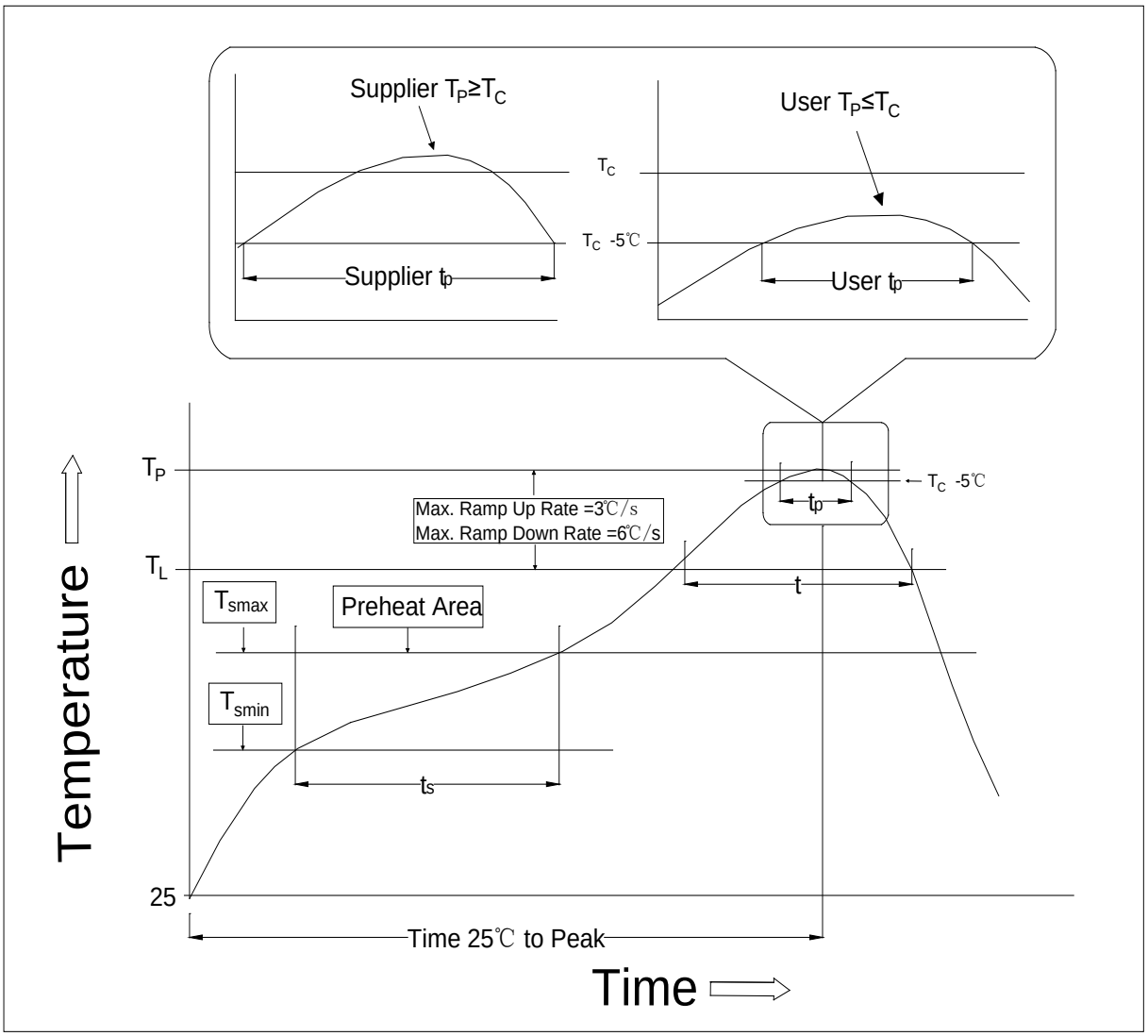
REFLOW INFORMATION



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100℃	150℃
Temperature Max. (Tsmax)	150℃	200℃
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3℃/second max.	3℃/second max.
Liquidus Temperature (TL)	183℃	217℃
Time (tL) Maintained Above (TL)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235℃+0℃/-5℃	260℃+0℃/-5℃
Time (tP) within 5℃ of 260℃	10 seconds	10 seconds
Ramp-down Rate (TP to TL)	3-6℃/second	3-6℃/second
Time 25℃ to Peak Temperature	6 minutes max.	8 minutes 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°C;

Recommend storage humidity: <60%;

MSL level: MSL 1