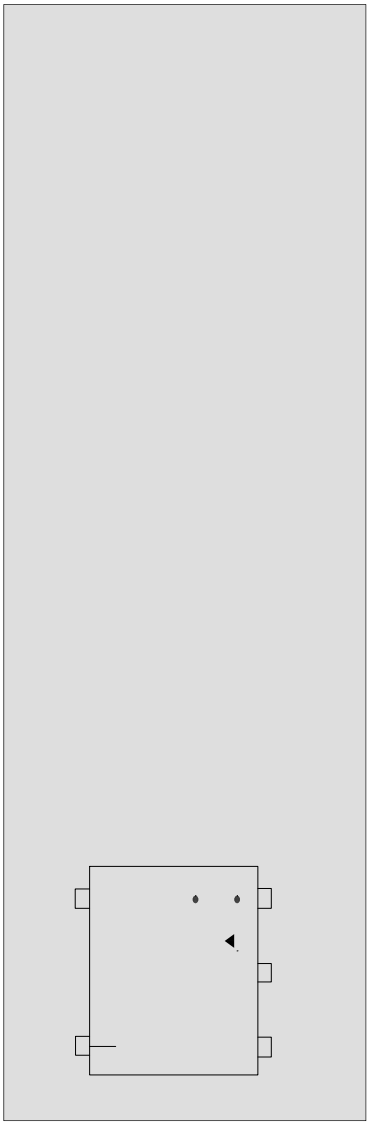
## JOCDA3AB-L5X Series

Rev.A.1.0

### 59{/wLt¢Lhb

The products are gate driver opto-couplers in LSOP5 and LSOP5W packages. The device consists of an infrared LED optically coupled to an integrated high-gain, high-speed photodetector IC chip. It provides guaranteed performance and specifications at temperature up to 110 . It is physically smaller and compliant with international safety standards for reinforced insulation. It thus provides a smaller footprint solution for applications that require safety standard certification. An internal noise shield provides a guaranteed common-mode transient immunity of ±35 kV/μs. It is ideal for small class IGBT and power MOSFET gate drive. The products are widely used in industrial inverters, IGBT gate drivers, MOSFET gate drivers, induction cooktop and home appliances.



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High isolation 5000 VRMS
Buffer logic type
Operating temperature range -40°C to 110°C
REACH & RoHS compliance
HBM: H3A; MM: M4; CDM: C3
CQC approved
VDE approved
UL approved

### ¢NJdzűK ¢l-ōfŜ

| LED | $V_{CC}$-$V_{EE}$ (Positive Going) | $V_{CC}$-$V_{EE}$ (Negative Going) | Output |
|---|---|---|---|
| OFF | 0-30V | 0-30V | Low |
| ON | 0-12.1V | 0-11.1V | Low |
| ON | 12.1V-13.5V | 11.1V-12.4V | TRANSITION |
| ON | 13.5V-30V | 12.4V-30V | HIGH |

## !.{h[¦¢9 a!·la¦a w!¢LbD{ (Temperature=25°C)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| LED | Forward Current | $I_F$ | 50 | mA |
| | Peak Forward Current | $I_{FP}$ | 1 | A |
| | Reverse Voltage | $V_R$ | 6 | V |
| | Power Dissipation | $P_D$ | 100 | mW |
| Detector | Output Voltage | $V_O$ | 35 | V |
| | Supply Voltage | $V_{CC}$ | 35 | V |
| | Power Dissipation | $P_C$ | 400 | mW |
| Isolation Voltage | | $V_{iso}$ | 5000 | Vrms |
| Operating Temperature | | $T_{opr}$ | -40~110 | |
| Junction Temperature | | $T_j$ | 125 | |
| Storage Temperature | | $T_{stg}$ | -55~125 | |
| Total Power Dissipation | | $P_{tot}$ | 500 | mW |
| Soldering Temperature | | $T_{sol}$ | 260 | |

**bh¢9M**: 100μs pulse, 100Hz frequency
**bh¢9H**: AC for 1minute, R.H.=40~60%

## 9[9/¢wL/![ /I!w!/¢9wL{¢L/{ (Temperature=25°C)

| Parameter | | Symbol | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Input | Forward Voltage | $V_F$ | $I_F$=10mA | - | 1.35 | 1.6 | V |
| | Reverse Current | $I_R$ | $V_R$=6V | - | - | 1 | μA |
| | Terminal Capacitance | $C_t$ | V=0,f=1MHz | - | 60 | - | pF |
| Output | Peak High-level Output Current | $I_{OPH}$ | $V_O$=$V_{CC}$-4V, Pulse width≤50μs | -1 | - | - | A |
| | | | $V_O$=$V_{CC}$-15V, Pulse width≤10μs | - | - | - | A |
| Output | Peak Low-level Output Current | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Common Mode Transient Immunity at Low Level Output | $\|CM_L\|$ | $I_F$=0mA<br>$V_{CC}$=30V,<br>$T_a$=25 ,<br>$V_O$(max)=1V<br>$V_{CM}$=1000Vpp | ± | | - | kV/μs |

All Typical values at $T_a$=25

**b2úŜM**: Input signal (f=25kHz,duty=50%, tr=tf=5ns or less). $C_L$ is less than 15 pF which includes probe and stray wiring capacitance.

**b2úŜH**: $CM_H$ is the maximum rate of fall of the common mode voltage that can be sustained with the output voltage in the logic high state (VO 26V).

**b2úŜo**: CML is the maximum rate of rise of the common mode voltage that can be sustained with the output voltage in the logic low state (VO 1V).

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| Characteristics | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Input On-state Current | $I_{F(ON)}$ | 6.5 | - | 10 | mA |
| Input Off-state Voltage | $V_{F(OFF)}$ | 0 | - | 0.8 | V |
| Supply Voltage | $V_{CC}$ | 15 | - | 30 | V |
| Operating Frequency | f | - | - | 25 | kHz |

**b2úŜM**: The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this datasheet should also be considered.

**b2úŜH**: Aceramic capacitor(0.1μF) should be connected between pin 6 ($V_{CC}$) and pin 4 (GND) to stabilize the operation of a high-gain linear amplifier. Otherwise, this photocoupler may not switch properly. The bypass capacitor should be placed within 1 cm of each pin.

**b2úŜo**: The rise and fall times of the input on-current should be less than 0.5 μs.

**b2úŜп**: If the rising slope of the supply voltage ($V_{CC}$) for the detector is steep, stable operation of the internal circuits cannot be guaranteed. Be sure to set 3 V/μs or less for a rising slope of the $V_{CC}$.

**b2úŜp**: Denotes the operating range, not the recommended operating condition.

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**FIG.1:** Forward Current vs. Forward Voltage

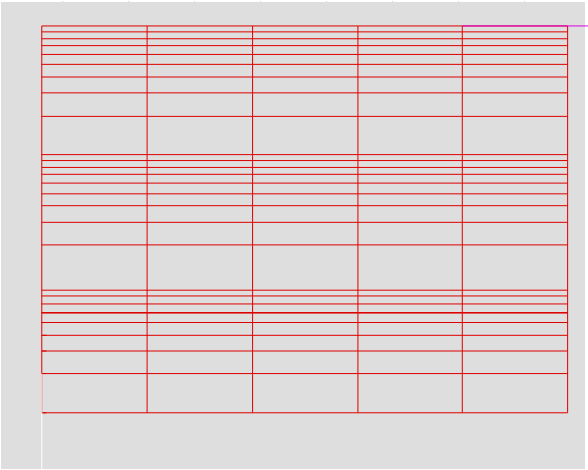

**FIG.2:** Max. Allowable LED Forward Current vs. Ambient Temperature

**FIG.13:** Propagation Delay Time vs. Supply Voltage

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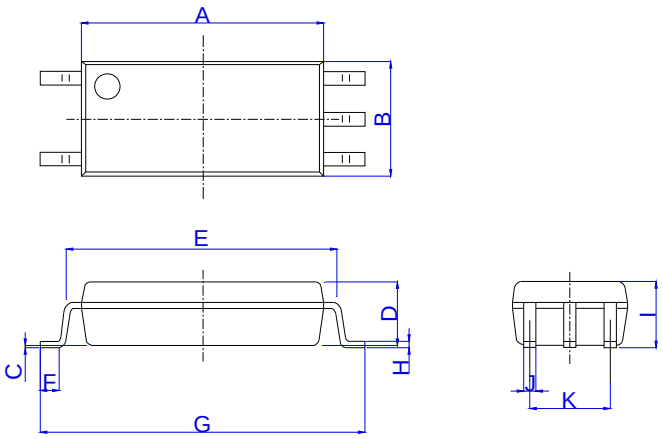


| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 7.40 | | 7.80 | 0.291 | | 0.307 |
| B | 3.40 | | 3.80 | 0.134 | | 0.150 |
| C | 0.00 | | 0.20 | 0.000 | | 0.008 |
| D | 1.80 | | 2.20 | 0.071 | | 0.087 |
| E | 8.10 | | 8.70 | 0.319 | | 0.343 |
| F | 0.40 | | 1.00 | 0.016 | | 0.039 |
| G | 9.90 | | 10.50 | 0.390 | | 0.413 |
| H | 0.10 | | 0.30 | 0.004 | | 0.012 |
| I | 1.80 | | 2.40 | 0.071 | | 0.094 |
| J | 0.25 | | 0.55 | 0.010 | | 0.022 |
| K | 2.29 | | 2.79 | 0.090 | | 0.110 |

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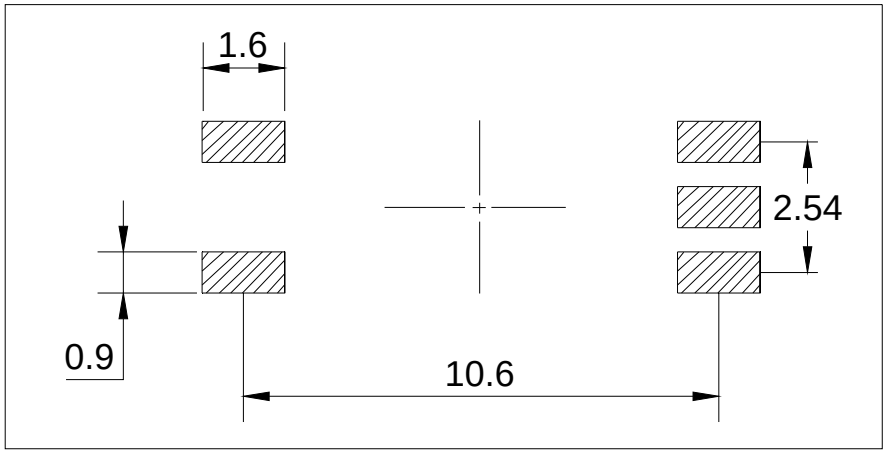


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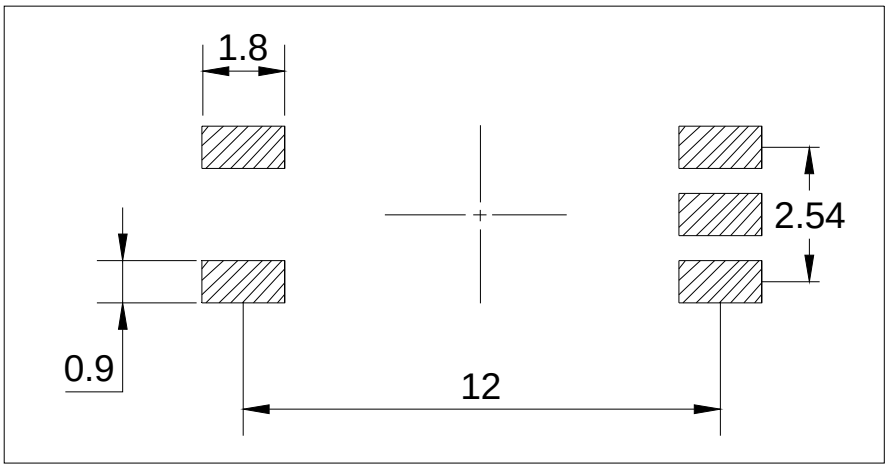

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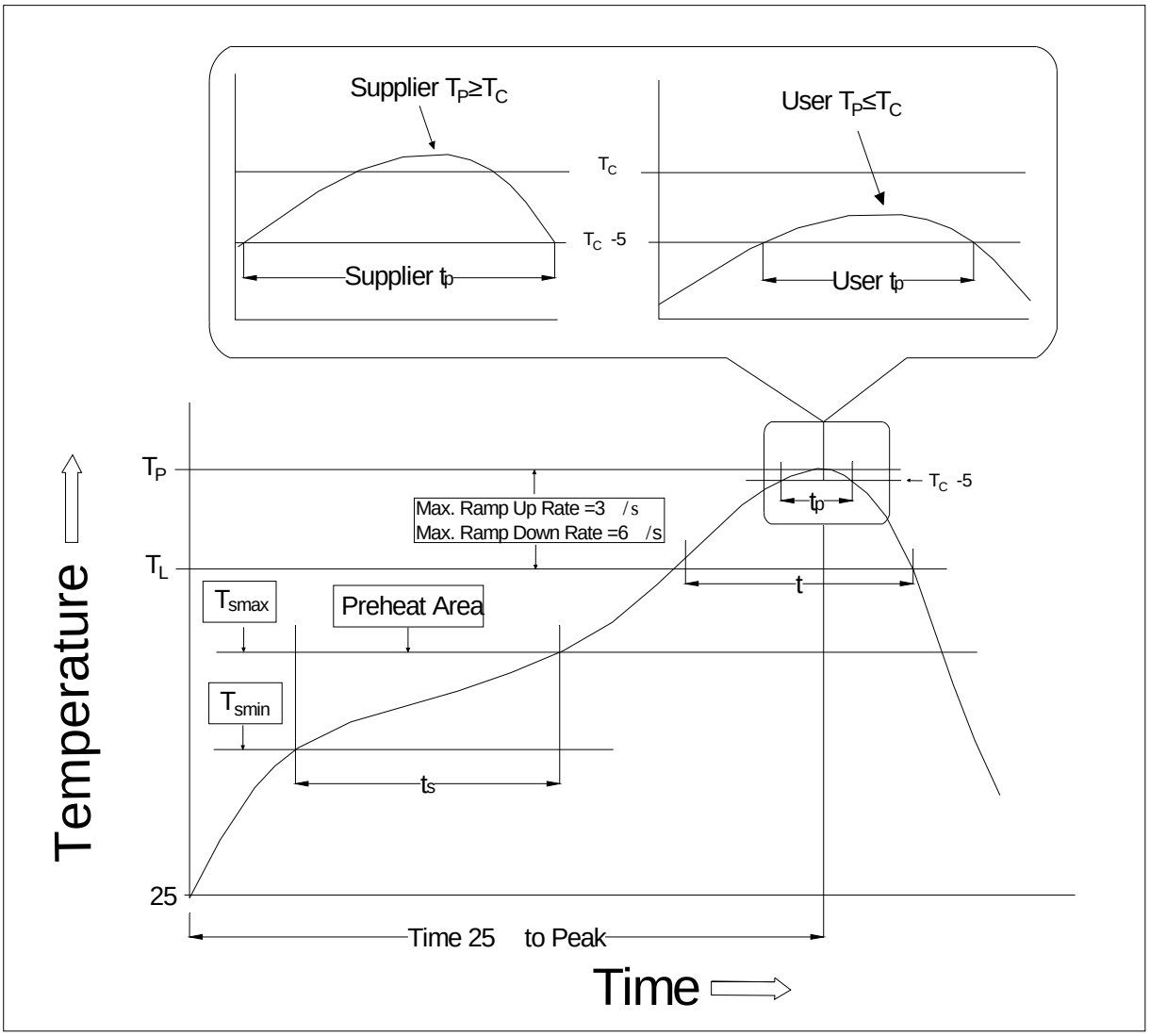


| Profile Feature | Sn-Pb Assembly Profile | Pb-Free Assembly Profile |
|---|---|---|
| Temperature Min. (Tsmin) | 100 | 150 |
| Temperature Max. (Tsmax) | 150 | 200 |
| Time (ts) from (Tsmin to Tsmax) | 60-120 seconds | 60-120 seconds |
| Ramp-up Rate (tL to tP) | 3 /second max. | 3 /second max. |
| 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 | 20 seconds | 30 seconds |
| Ramp-down Rate (TP to TL) | 6 /second max. | 6 /second max. |
| 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