

ISLT100xV



DESCRIPTION

The ISLT100xV series optocouplers consists of an infrared emitting diode optically coupled to an NPN silicon photo transistor.

These devices belong to Isocom Long Creepage Range of Optocouplers.

FEATURES

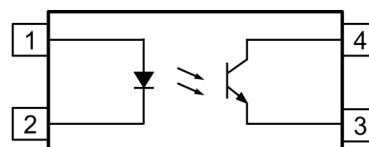
- Long Creepage 8mm
- High AC Isolation voltage $5000V_{RMS}$
- CTR Selections Available
- Wide Operating Temperature Range $-55^{\circ}C$ to $110^{\circ}C$
- Pb Free and RoHS Compliant
- UL Approval E91231
- VDE Approval 40042752

APPLICATIONS

- Switching Mode Power Supply
- System Appliances
- Measuring Instruments
- Telecommunication Equipments
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Available in Tape and Reel with 3000pcs per reel



- 1 Anode
- 2 Cathode
- 3 Emitter
- 4 Collector

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^{\circ}C$)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

| | |
|---|-------|
| Forward Current | 60mA |
| Peak Forward Current (1 μ s, pulse) | 1.5A |
| Reverse Voltage | 6V |
| Power dissipation | 100mW |

Output

| | |
|--|-------|
| Collector to Emitter Voltage V_{CEO} | 80V |
| Emitter to Collector Voltage V_{ECO} | 7V |
| Collector Current | 50mA |
| Power Dissipation | 150mW |

Total Package

| | |
|----------------------------------|-------------------------|
| Isolation Voltage | $5000V_{RMS}$ |
| Total Power Dissipation | 250mW |
| Operating Temperature | -55 to $110^{\circ}C$ |
| Storage Temperature | -55 to $125^{\circ}C$ |
| Lead Soldering Temperature (10s) | $260^{\circ}C$ |

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ISLT100xV

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

INPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------|----------|------------------------------------|-----|------|-----|---------------|
| Forward Voltage | V_F | $I_F = 50\text{mA}$ | | 1.45 | 1.5 | V |
| Reverse Current | I_R | $V_R = 6\text{V}$ | | | 10 | μA |
| Input Capacitance | C_{IN} | $V_F = 0\text{V}, f = 1\text{kHz}$ | | 50 | | pF |

OUTPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------------|------------|---|-----|------|-----|------|
| Collector-Emitter Breakdown Voltage | BV_{CEO} | $I_C = 0.1\text{mA}, I_F = 0\text{mA}$ | 80 | | | V |
| Emitter-Collector Breakdown Voltage | BV_{ECO} | $I_E = 0.1\text{mA}, I_F = 0\text{mA}$ | 7 | | | V |
| Collector-Emitter Dark Current | I_{CEO} | $V_{CE} = 20\text{V}, I_F = 0\text{mA}$ | | | 100 | nA |



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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

COUPLED

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------------|---------------|---|-----|------|-----|---------------|--|
| Current Transfer Ratio | CTR | $I_F = 5\text{mA}, V_{CE} = 5\text{V}$ | | | | % | |
| | | ISLT1001V | 50 | | 600 | | |
| | | ISLT1007V | 80 | | 160 | | |
| | | ISLT1008V | 130 | | 260 | | |
| | | ISLT1009V | 200 | | 400 | | |
| | | $I_F = 10\text{mA}, V_{CE} = 5\text{V}$ | | | | | |
| | | ISLT1002V | 63 | | 125 | | |
| | | ISLT1003V | 100 | | 200 | | |
| | | ISLT1004V | 160 | | 320 | | |
| | | $I_F = 1\text{mA}, V_{CE} = 5\text{V}$ | | | | | |
| | | ISLT1002V | 22 | | | | |
| | | ISLT1003V | 34 | | | | |
| ISLT1004V | 56 | | | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_F = 10\text{mA}, I_C = 1\text{mA}$ | | | 0.3 | V | |
| Floating Capacitance | C_f | $V_F = 0\text{V}, f = 1\text{MHz}$ | | | 1.0 | pF | |
| Turn On Time | t_{on} | $V_{CE} = 2\text{V}, I_c = 5\text{mA}, R_L = 100\Omega$ | | 4 | | μs | |
| Turn Off Time | t_{off} | | | 3 | | μs | |
| Output Rise Time | t_r | | | | 18 | μs | |
| Output Fall Time | t_f | | | | 18 | μs | |

ISOLATION

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------------------------|-----------|---|--------------------|------|-----|----------|
| Isolation Voltage | V_{ISO} | R.H. = 40% to 60%, $t = 1\text{ min}$ (Note 1) | 5000 | | | V_{AC} |
| Input - Output Isolation Resistance | R_{I-O} | R.H. = 40% to 60% with input leads shorted together and 100VDC leads shorted together. (Note 1) | 5×10^{10} | | | Ω |

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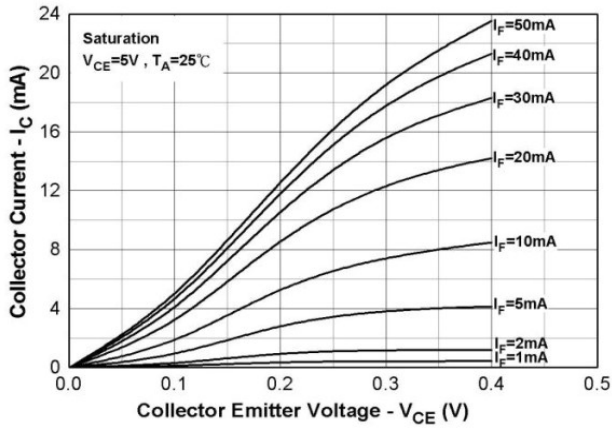


Fig 1 Collector Current vs Collector-Emitter Voltage (1)

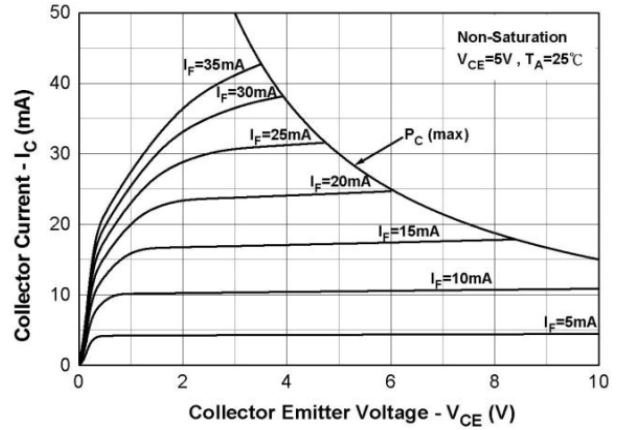


Fig 2 Collector Current vs Collector-Emitter Voltage (2)

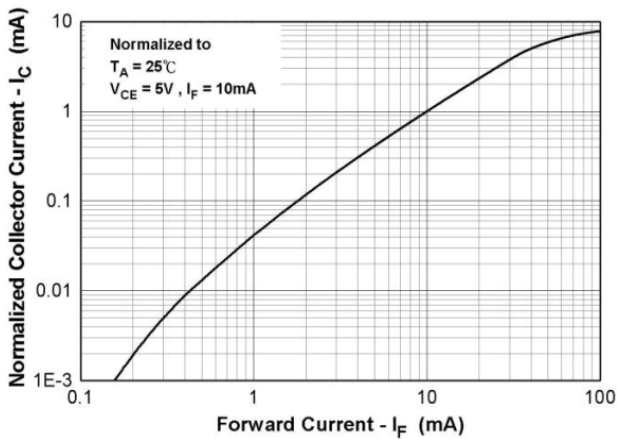


Fig 3 Normalized Collector Current vs Forward Current

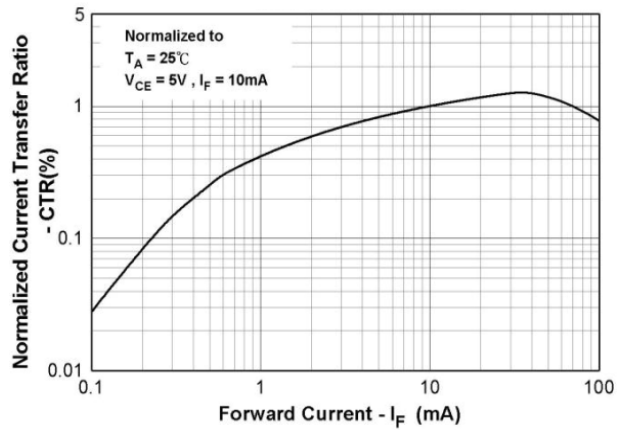


Fig 4 Normalized Current Transfer Ratio vs Forward Current

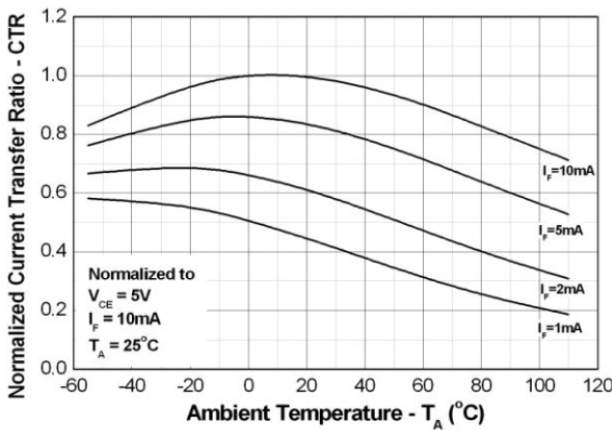


Fig 5 Normalized Current Transfer Ratio vs Ambient Temperature (1)

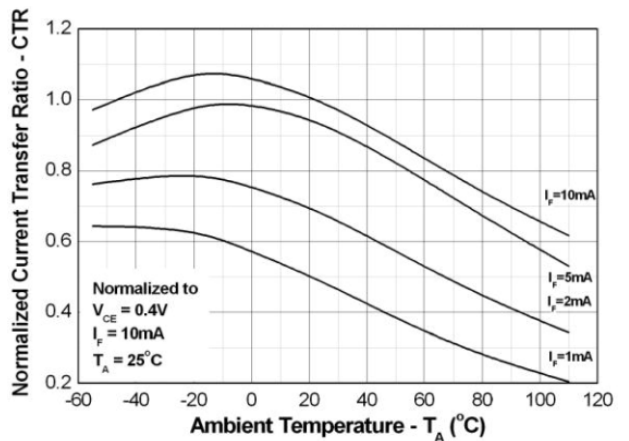


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature (2)

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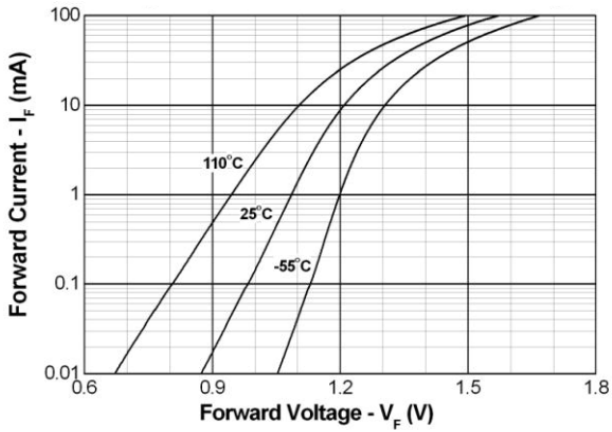


Fig 7 Forward Current vs Forward Voltage

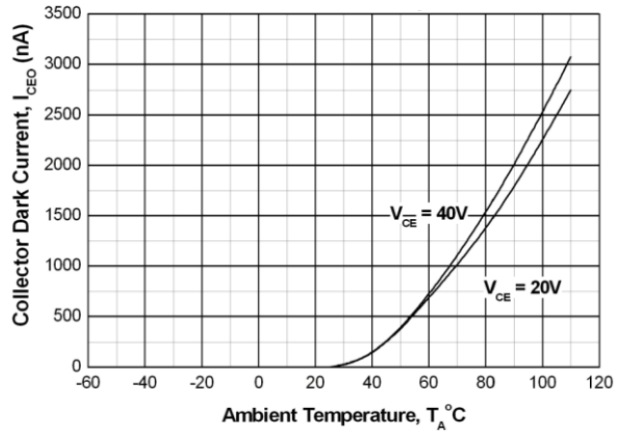


Fig 8 Collector Dark Current vs Ambient Temperature

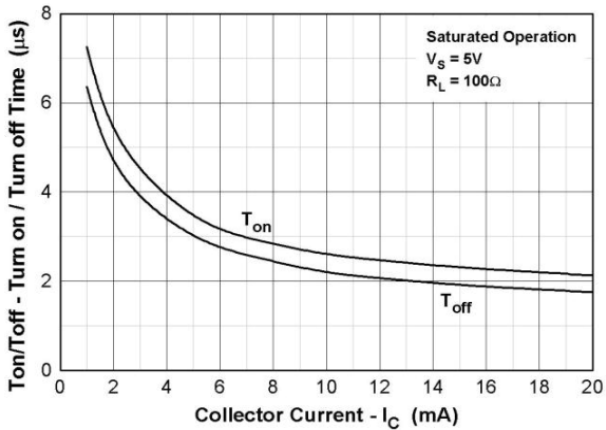


Fig 9 Turn on/off Time vs Collector Current

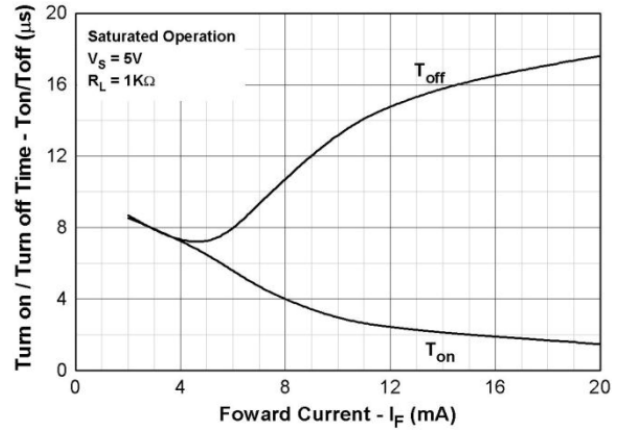
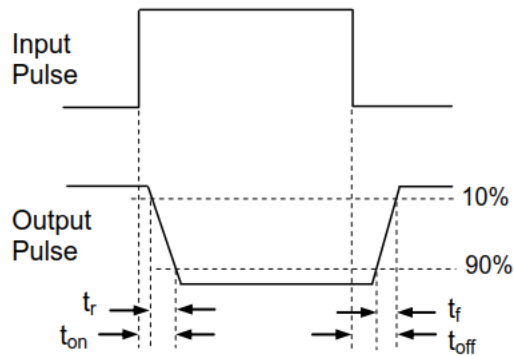
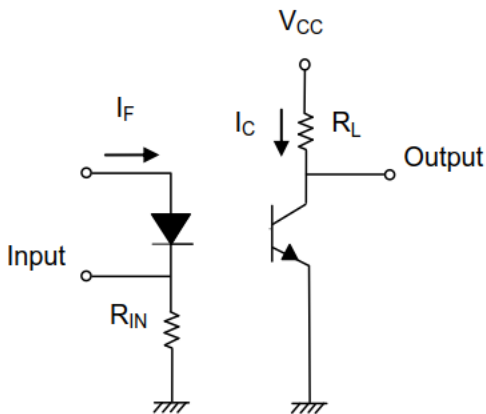


Fig 10 Turn on/off Time vs Forward Current



Switching Time Test Circuit and Waveforms

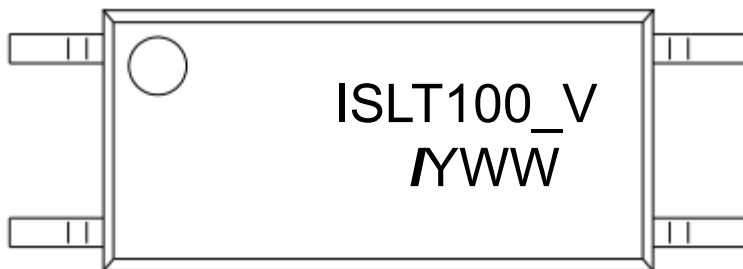
ISLT100xV

ORDER INFORMATION

| ISLT100xV | | | |
|---------------|---|---------------------------|-------------------|
| After PN | PN | Description | Packing quantity |
| Any CTR Grade | ISLT1001V, ISLT1002V, ISLT1003V, ISLT1004V, ISLT1007V, ISLT1008V, ISLT1009V | Surface Mount Tape & Reel | 3000 pcs per reel |

NB: Units marked ISLT1000V = ISLT1001V

DEVICE MARKING



ISLT100_V denotes Device Part Number where “_” denotes the CTR Grade

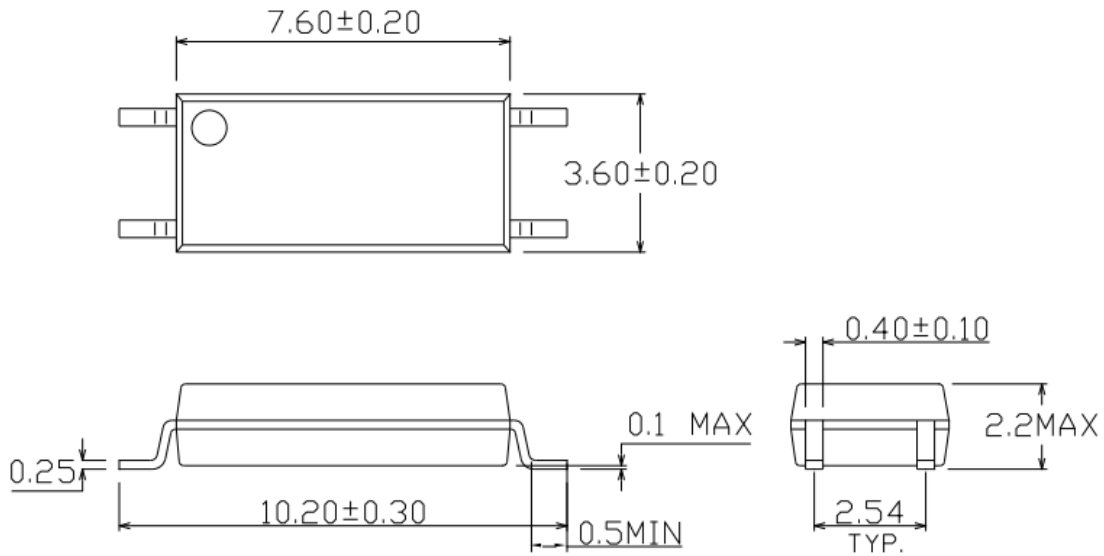
I denotes Isocom

Y denotes 1 digit Year code

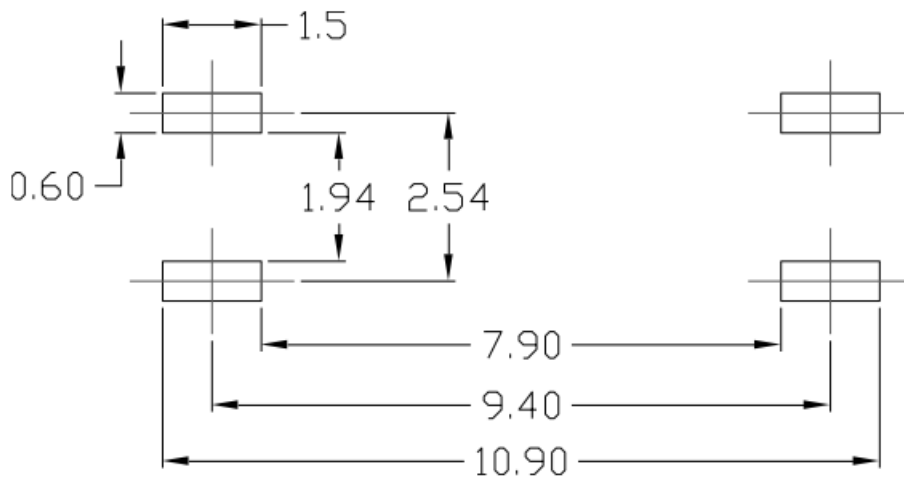
WW denotes 2 digit Week code

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PACKAGE DIMENSIONS (mm)



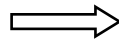
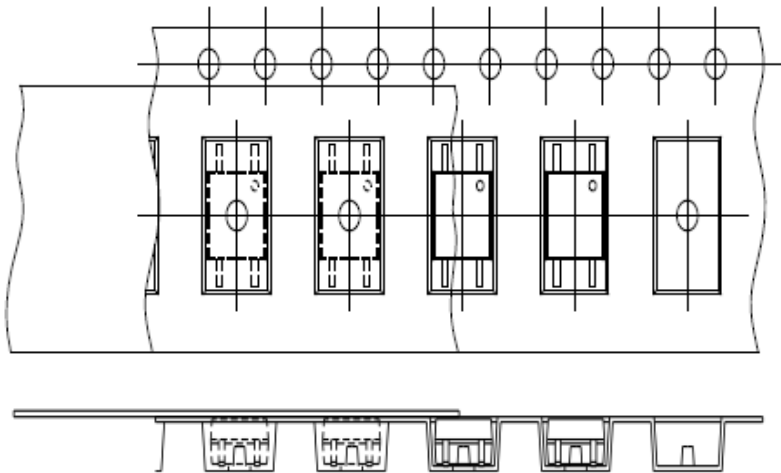
RECOMMENDED SOLDER PAD LAYOUT (mm)



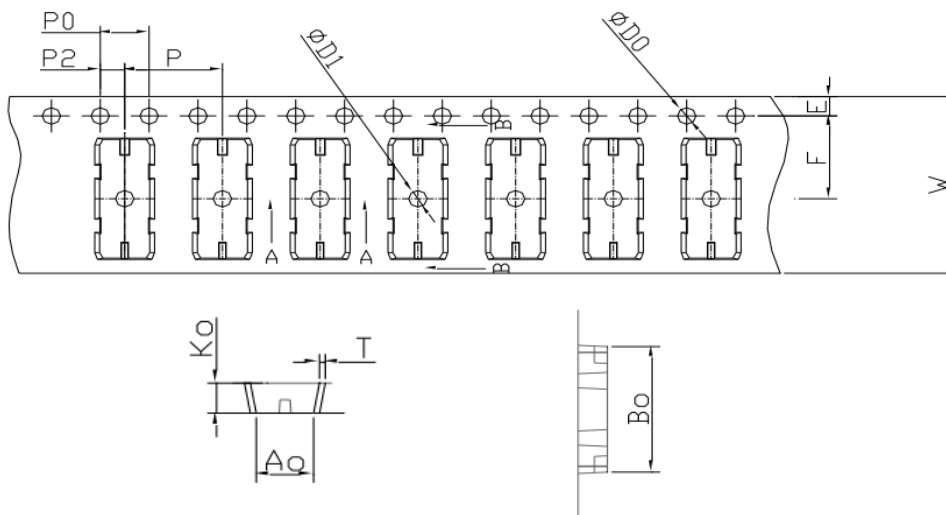


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TAPE AND REEL PACKAGING



Direction of feed from reel

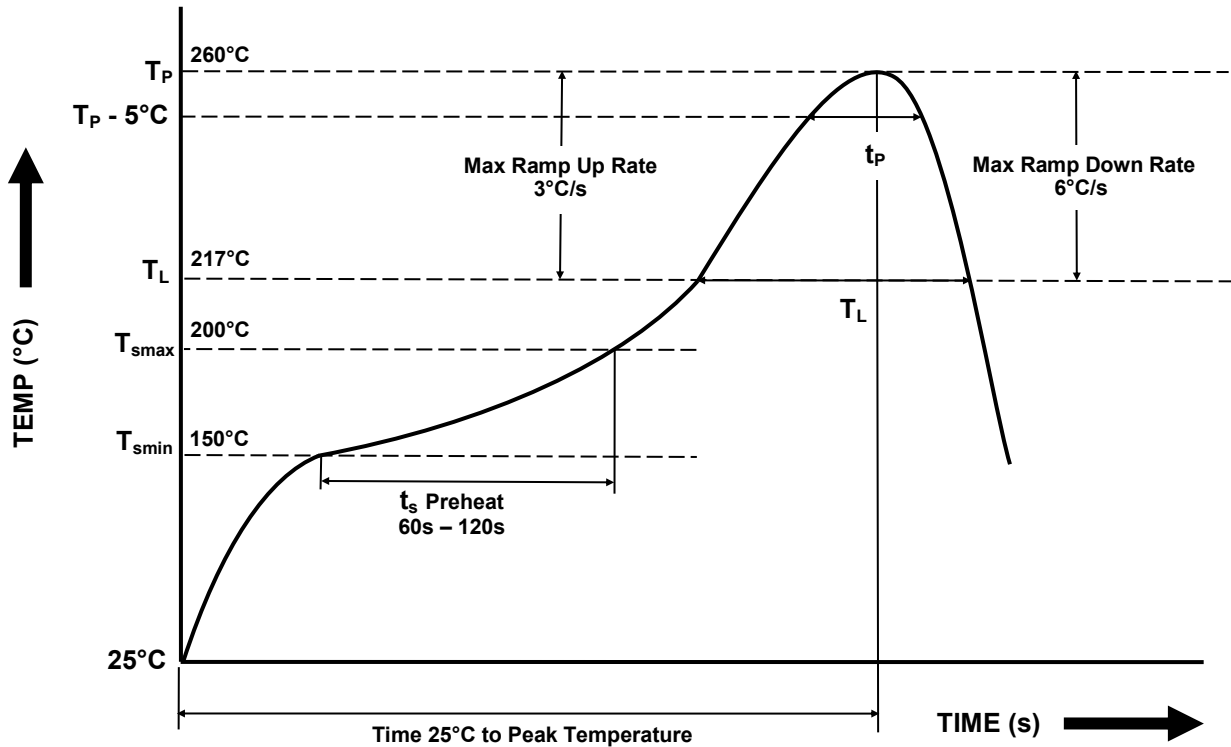


| | | | | | | |
|----------------|----------------------|----------------------|----------------------|----------------------|-----------|----------------------|
| Dimension No. | A₀ | B₀ | D₀ | D₁ | E | F |
| Dimension (mm) | 3.9±0.10 | 10.82±0.10 | 1.5+0.1/-0 | 1.5±0.10 | 1.75±0.10 | 7.5±0.10 |
| Dimension No. | P₀ | P | P₂ | T | W | K₀ |
| Dimension (mm) | 4.0±0.15 | 8.0±0.10 | 2.0±0.10 | 0.4±0.05 | 16.0±0.3 | 2.25±0.1 |



ISLT100xV

IR REFLOW SOLDERING TEMPERATURE PROFILE
One Time Reflow Soldering is Recommended.
Do not immerse device body in solder paste.



| Profile Details | Conditions |
|---|---|
| Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s) | 150°C 200°C 60s - 120s |
| Soldering Zone - Peak Temperature (T_P) - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L) | 260°C 217°C 30s 60s - 100s 3°C/s max 6°C/s max |
| Average Ramp Up Rate (T_{smax} to T_P) | 3°C/s max |
| Time 25°C to Peak Temperature | 8 minutes max |



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