



ISSR11800X



DESCRIPTION

The ISSR11800X is a high-performance single-channel solid-state relay that integrates a silicon carbide (SiC) MOSFET and an AlGaAs infrared LED.

This compact device achieves efficient optical coupling and isolation through a photovoltaic generator, ensuring reliable signal transfer between input and output circuits.

With a voltage rating of 1800V and an isolation rating of 5000Vrms, the ISSR11800X offers robust performance in a durable 5-pin package.

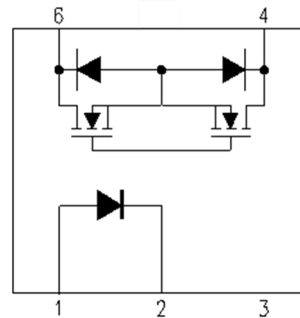
FEATURES

- High peak load voltage of 1,800V (AC/DC)
- 5,000Vrms reinforced isolation between input and output
- Low, stable on-resistance for reliable operation
- SMD-formed DIP-5 package
- UL 1577 Pending Approval
- VDE DIN EN60747-5-5 Pending Approval
- MSL Class 1
- Automotive-grade AEC-Q101 qualified

APPLICATIONS

- Ideal for controlling various loads, including relays, motors, lamps, and solenoids
- Static AC power switching applications
- Battery Management Systems (BMS) with flying capacitor topology for battery sensing
- Precision measuring instruments
- Data communication and IT equipment applications
- EV & Hybrid Electric Industry

Pin No. and Internal connection diagram



1. Anode
2. Cathode
4. Drain
6. Drain

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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 | 50mA |
| Reverse Voltage | 5V |
| Power dissipation | 75mW |
| Junction Temperature | 135°C |

Output

| | |
|-----------------------------------|-------|
| Load Voltage (Peak AC & DC) | 1800V |
| Cont. Load Current (Peak AC & DC) | 20mA |
| Power Dissipation | 360mW |
| Junction Temperature | 175°C |

Total Package

| | |
|----------------------------------|----------------------|
| Isolation Voltage | 5000V _{RMS} |
| Total Power Dissipation | 410mW |
| Operating Temperature | -40 to 125°C |
| Storage Temperature | -55 to 150 °C |
| Lead Soldering Temperature (10s) | 260°C |

ISOCOM COMPONENTS 2004 LTD

Unit 25B, Park View Road West, Park View Industrial Estate
Hartlepool, Cleveland, TS25 1PE, United Kingdom
Tel : +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
e-mail : sales@isocom.co.uk
<http://www.isocom.com>

ISOCOM COMPONENTS ASIA LTD

Hong Kong Office
Block A, 8/F, Wah Hing Industrial Mansions
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong
Tel : +852 2995 9217 Fax : +852 8161 6292
e-mail : sales@isocom.com.hk



Recommended Operating Conditions

| Parameter | Symbol | Min | Typ | Max | Unit |
|-----------------------|-----------|-----|-----|------|------|
| Load Voltage | V_L | - | - | 1500 | V |
| Forward Current | I_F | 5 | 10 | 25 | mA |
| Load Current | I_{ON} | - | - | 20 | mA |
| Operating Temperature | T_{opr} | -20 | - | 105 | °C |

NOTE :

Recommended operating conditions are given as a design guideline to obtain expected performance of the device.

Each item is an independent guideline.

Please also refer to specified characteristics in this document.



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

INPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------|--------|-------------------|-----|------|------|---------------|
| Forward Voltage | V_F | $I_F=10\text{mA}$ | - | 1.45 | 1.75 | V |
| Reverse Current | I_R | $V_R=5\text{V}$ | - | - | 10 | μA |

OUTPUT

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-------------------|------------|---------------------------------------|-----|------|-----|---------------|
| OFF-State Current | I_{Leak} | $I_F=0\text{mA}$, $V_L=1500\text{V}$ | - | - | 10 | μA |

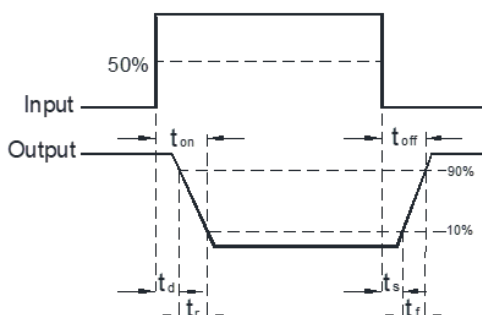
COUPLED

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|---------------------|------------|--|-----|------|-----|----------|
| Trigger LED Current | I_{FT} | $I_L=20\text{mA}$ | - | 0.8 | 3 | mA |
| Return LED Current | I_{Foff} | $I_{OFF}=10\mu\text{A}$ | 0.1 | - | - | mA |
| On Resistance | R_{ON} | $I_F=10\text{mA}$ $I_{ON}=20\text{mA}$ $t < 1\text{s}$ | - | 15 | 100 | Ω |

TRANSFER

| Parameter | Symbol | Test Condition | Min | Typ. | Max | Unit |
|----------------------------|-----------|--|-------------------|------|-----|----------|
| Turn on time ¹ | T_{ON} | $I_F=10\text{mA}$, $V_{CC}=10\text{V}$ $R_L=100\Omega$ | - | 0.5 | 1.0 | ms |
| Turn off time ¹ | T_{OFF} | $I_F=10\text{mA}$, $V_{CC}=10\text{V}$ $R_L=100\Omega$ | - | 0.05 | 0.2 | ms |
| Isolation Resistance | R_{ISO} | DC500V, R.H.40 ~ 60% | $1 \cdot 10^{11}$ | - | - | Ω |

Note¹- Turn on/off time:





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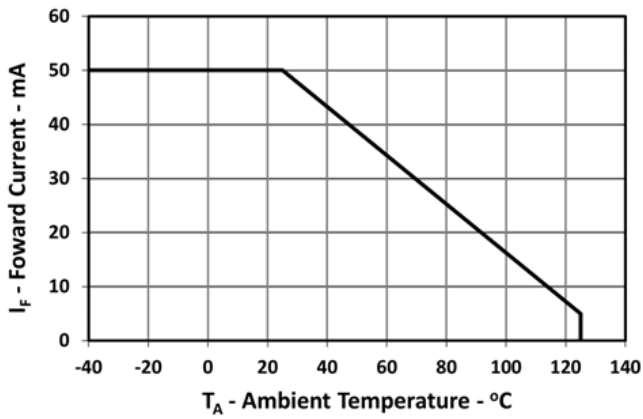


Fig 1 Forward Current vs Ambient Temperature

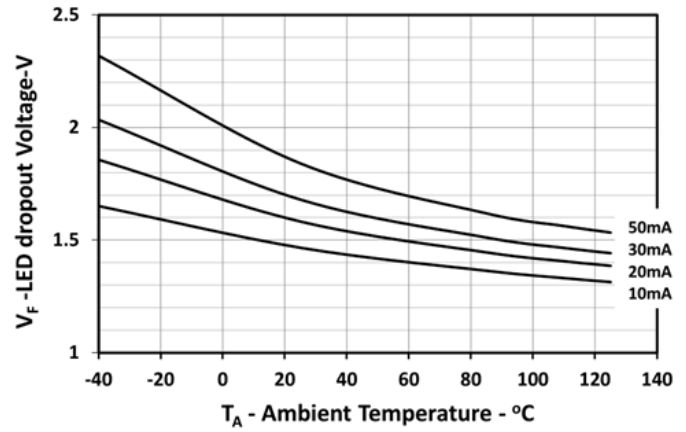


Fig. 2 Dropout Voltage vs. Ambient Temperature

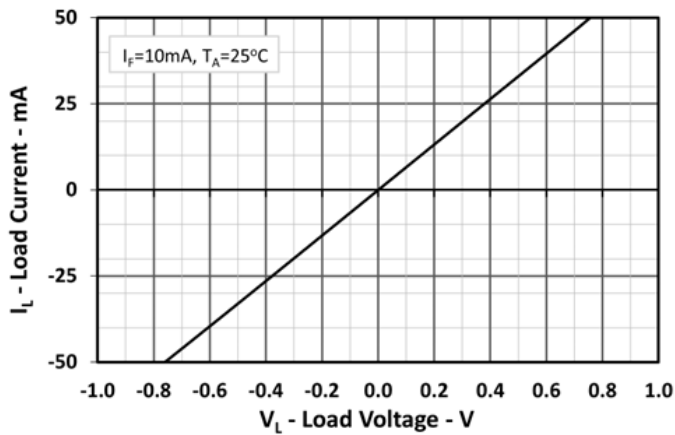


Fig. 3 On-State Current vs On-State Voltage



Fig 4 Switching Time vs Forward Current

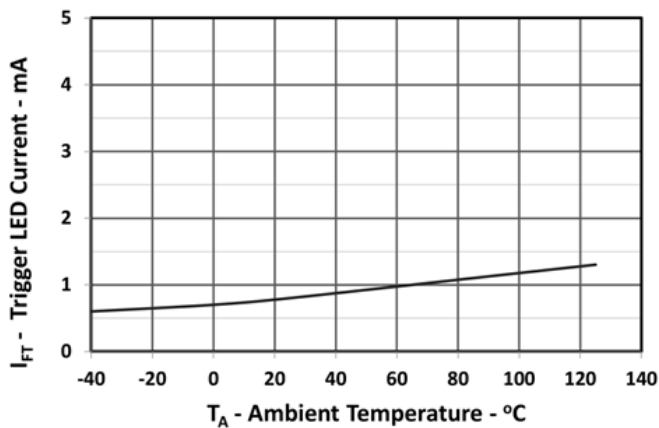


Fig. 5 Trigger Current vs Ambient Temperature

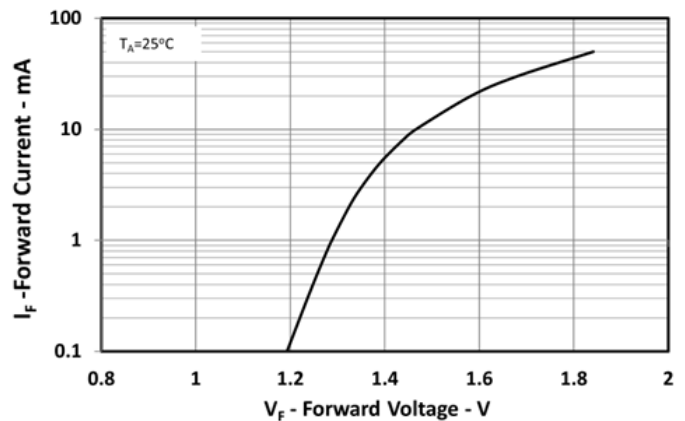


Fig. 6 Forward Current vs Forward Voltage



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ORDER INFORMATION

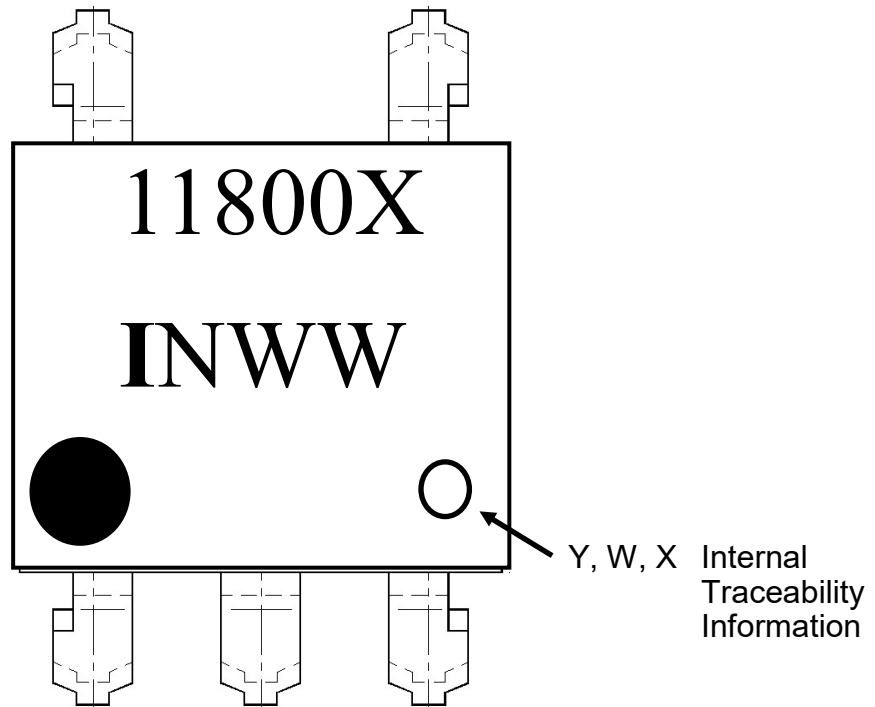
| ISSR11800X | | | |
|------------|-----------------|------------------|----------------------|
| After PN | PN | Description | Packing quantity |
| None | ISSR11800XSMT&R | SMT-Formed 5-Pin | Tape & Reel 1000 pcs |



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DEVICE MARKING



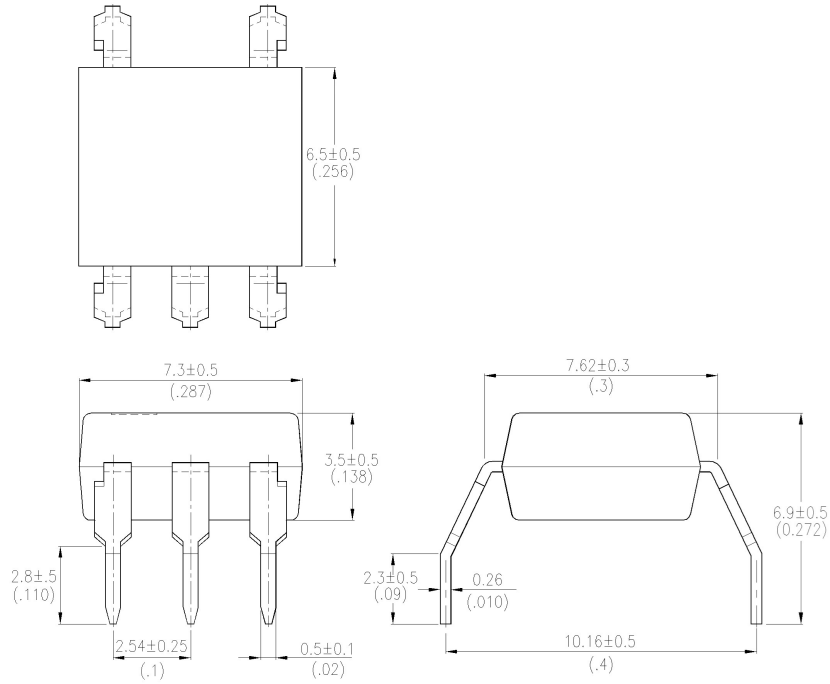
| | |
|--------|--|
| 11800X | Device Part Number |
| I | Isocom Components 2004 Ltd. |
| N | Year code (A= 2010, B = 2011, etc.) |
| WW | 2 digit Week code |



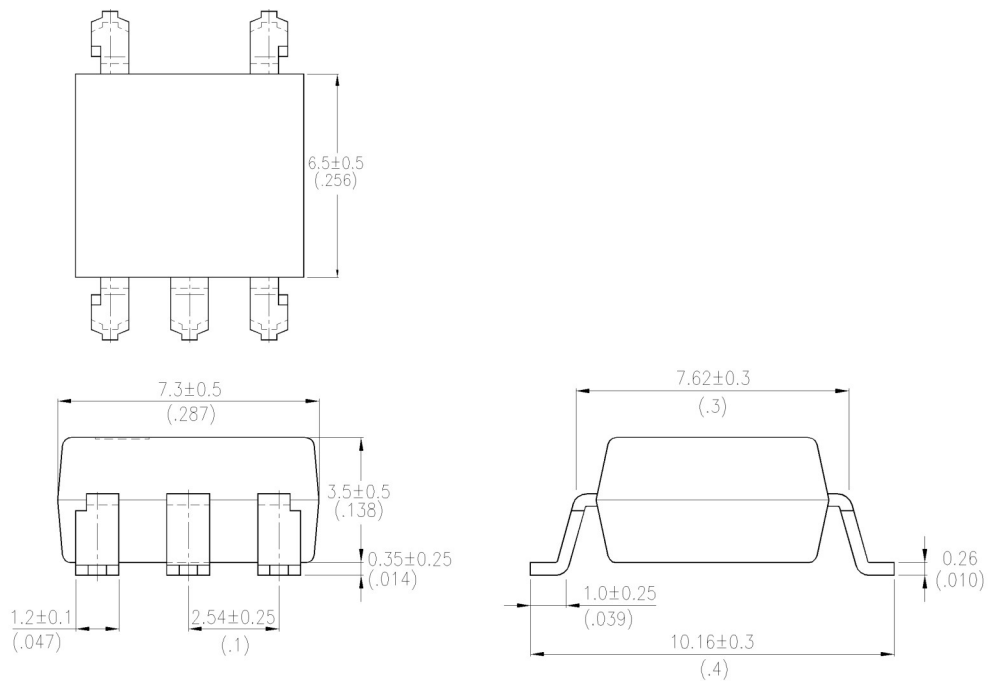
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PACKAGE DIMENSIONS in mm (inch)

DIP



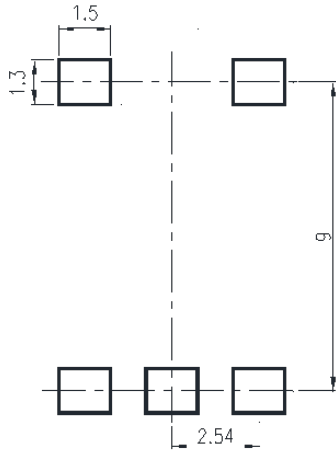
SMD



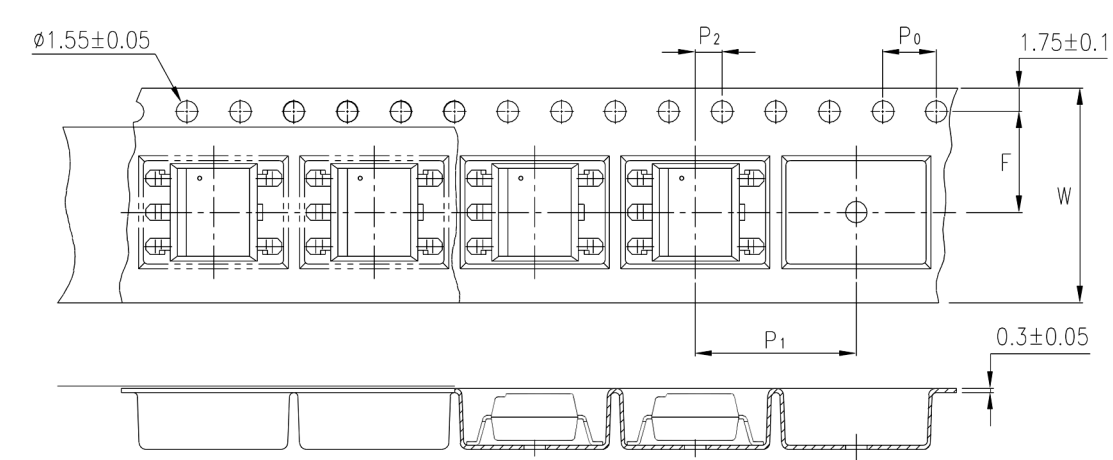


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RECOMMENDED PAD LAYOUT FOR SMD (mm)



TAPE AND REEL PACKAGING

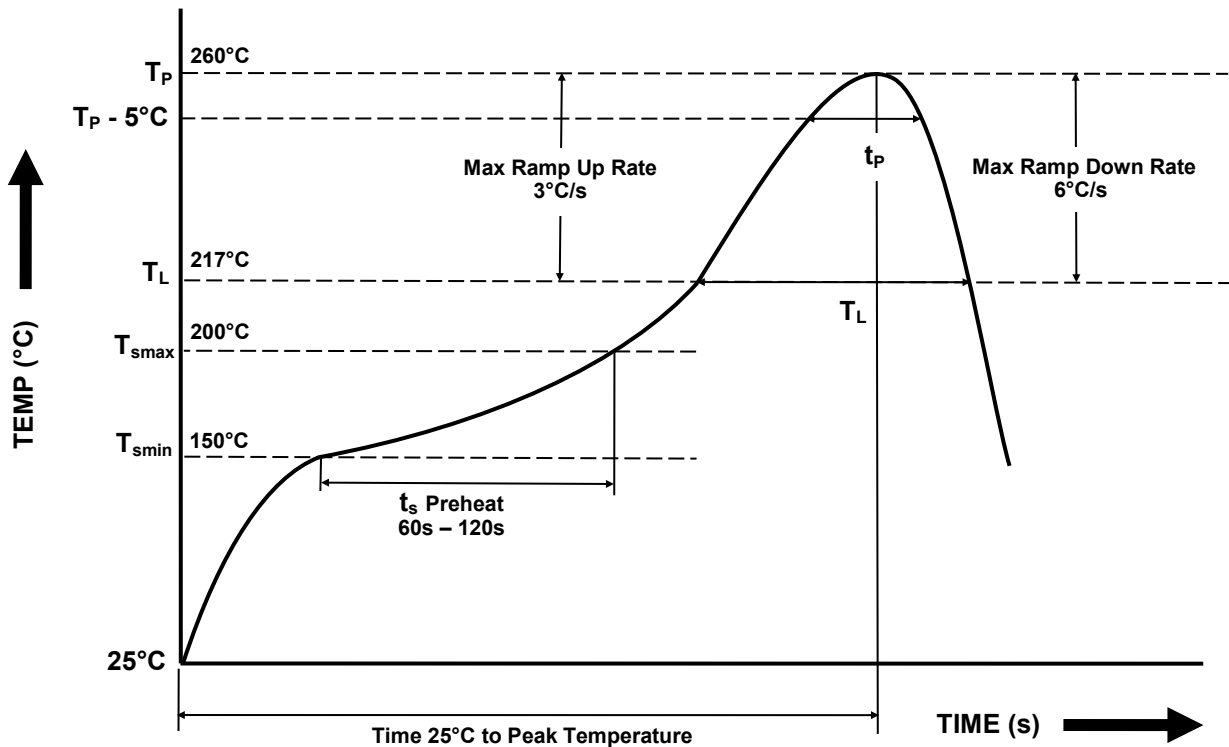


| Description | Symbol | Dimension mm (inch) |
|---|----------------|------------------------|
| Tape Width | W | 16 ± 0.3 (0.63) |
| Pitch of Sprocket Holes | P ₀ | 4 ± 0.1 (0.15) |
| Distance of Compartment to Sprocket Holes | F | 7.5 ± 0.1 (0.295) |
| | P ₂ | 2 ± 0.1 (0.079) |
| Distance of Compartment to Compartment | P ₁ | 12 ± 0.1 (0.472) |



IR REFLOW SOLDERING TEMPERATURE PROFILE

Note : 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) - Time at Peak Temperature - Liquidous Temperature (T _L) - Time within 5°C of Actual Peak Temperature (T _P - 5°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 10s max 217°C 30s max 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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Document Change Log

| Date | Document Number | Change |
|------------|-----------------|-----------------|
| 07/07/2025 | DN93331-01 | Initial Release |
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