

Features

- 2.3" (56.80mm) Digit Height
- Single Digit Display
- Black/Grey Face, White Segment
- IC compatible, Easy assembly
- Dynamic drive connects
- RoHS Compliant, Pb Free

Applications

- Consumer Electronics
- Industrial Equipment

Description

The INND-TS230 series is a 2.3" single digit display. It is a through hole type LED display which can be used in various applications.

Internal Circuit Diagram

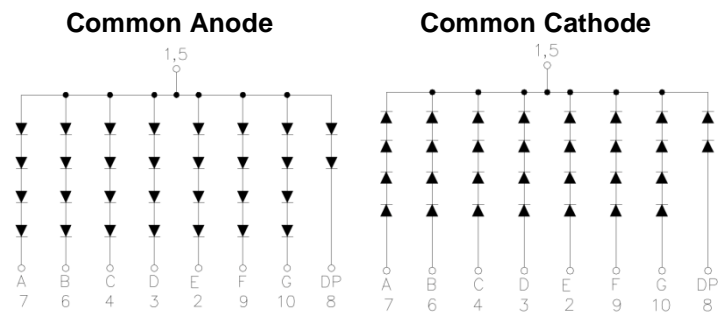


Figure 1. INND-TS230 series Internal Circuit Diagram

Package Dimensions

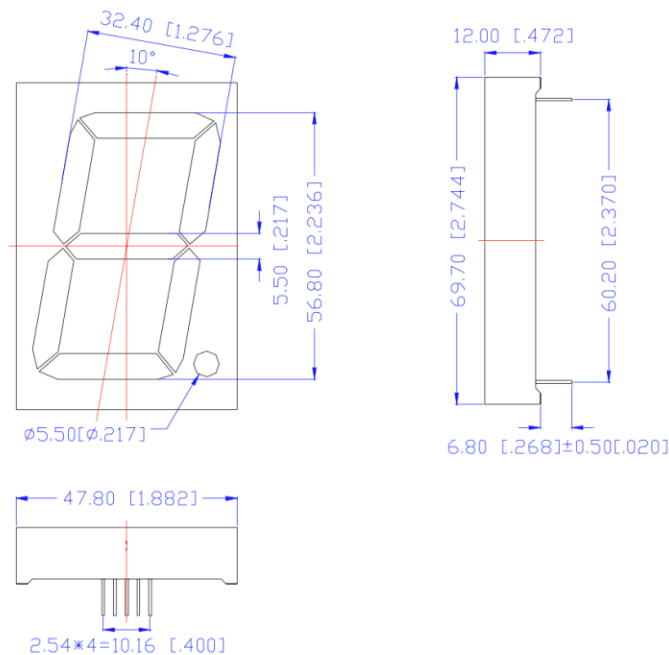
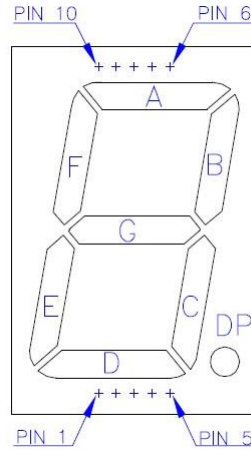


Figure 2. INND-TS230 series Package Dimensions

Notes

1. All pins are $\varnothing 0.60 [0.024] \pm 0.1 [0.004]$
2. Dimension in millimeter [inch], tolerance is $\pm 0.25 [0.010]$ and angle is $\pm 1^\circ$ unless otherwise noted.
3. Bending \leq Length * 1%.

All Light On Segments Feature & Pin Position



Absolute Maximum Rating at 25°C (Note 1)

Product (Per Segment)	Emission Color	Technology	Pd (mW)	IF (mA)	IFP* (mA)	VR (V)	Derate from 25°C (mA/°C)	T _{OP} (°C)	T _{ST} (°C)
INND-TS230YGXX	Yellow Green	AlGaInP	70	25	90	5	0.33	-35°C~+85°C	-35°C~+85°C
INND-TS230YXX	Yellow	AlGaInP	70	25	90	5	0.33	-35°C~+85°C	-35°C~+85°C
INND-TS230AXX	Amber	AlGaInP	70	25	90	5	0.33	-35°C~+85°C	-35°C~+85°C
INND-TS230RXX	Red	AlGaInP	70	25	90	5	0.33	-35°C~+85°C	-35°C~+85°C
INND-TS230DRXX	Deep Red	AlGaInP	70	25	90	5	0.33	-35°C~+85°C	-35°C~+85°C
INND-TS230GXX	Green	InGaN	114	30	100	5	0.4	-35°C~+85°C	-35°C~+85°C
INND-TS230BXX	Blue	InGaN	114	30	100	5	0.4	-35°C~+85°C	-35°C~+85°C
INND-TS230WXX	White	InGaN	114	30	100	5	0.4	-35°C~+85°C	-35°C~+85°C

Notes

1. Condition for IFP is pulse of 1/10 duty and 0.1msec width

Electrical Characteristics $T_A = 25^\circ\text{C}$ (Note 1)

Product (Per Segment)	Emission Color	$V_F(\text{V})@20\text{mA}$ Forward Voltage Per Segment (DP)			$\lambda(\text{nm})@20\text{mA}$		$I_V(\text{mcd})@10\text{mA}$			$I_R(\mu\text{A})$ @ $V_R=5\text{V}$	I_{V-M} @ $I_F=10\text{mA}$
		min	typ.	max	λ_D	λ_P	min	typ.	max	max	max
INND-TS230YGXX	Yellow Green	-	8(4)	11.2(5.6)	570	572	-	110	-	100	2:1
INND-TS230YXX	Yellow	-	8(4)	11.2(5.6)	590	592	-	283	-	100	2:1
INND-TS230AXX	Amber	-	8(4)	11.2(5.6)	605	612	-	314	-	100	2:1
INND-TS230RXX	Red	-	8(4)	11.2(5.6)	630	644	-	141	-	100	2:1
INND-TS230DRXX	Deep Red	-	8(4)	11.2(5.6)	645	660	-	114	-	100	2:1
INND-TS230GXX	Green	-	12.8(6.4)	15.2(7.6)	525	-	-	1413	-	100	2:1
INND-TS230BXX	Blue	-	9.6(3.2)	11.4(3.8)	465	-	-	195	-	50	2:1
INND-TS230WXX	White	-	9.6(3.2)	11.4(3.8)	X: 0.27 Y: 0.25	-	-	600	-	50	2:1

Notes

1. Performance guaranteed only under conditions listed in above tables.

ESD Precaution

ATTENTION: Electrostatic Discharge (ESD) protection



The symbol above denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are STATIC SENSITIVE devices. ESD precaution must be taken during design and assembly. If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

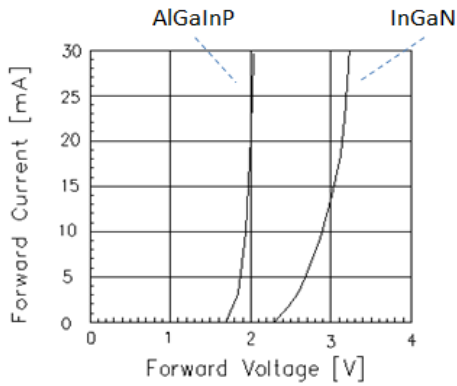
Characteristic Curves for YG, Y, A, R, DR, G


Fig 1. Forward Current vs. Forward Voltage

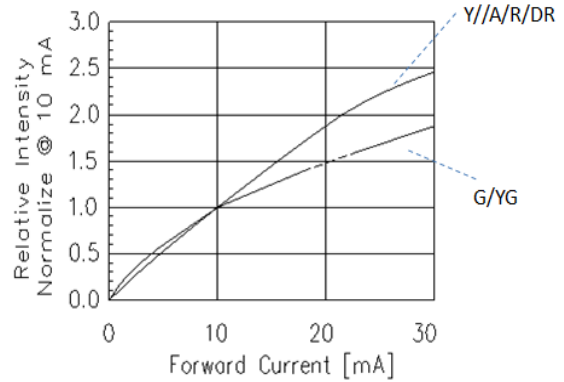


Fig 2. Relative Intensity vs. Forward Current

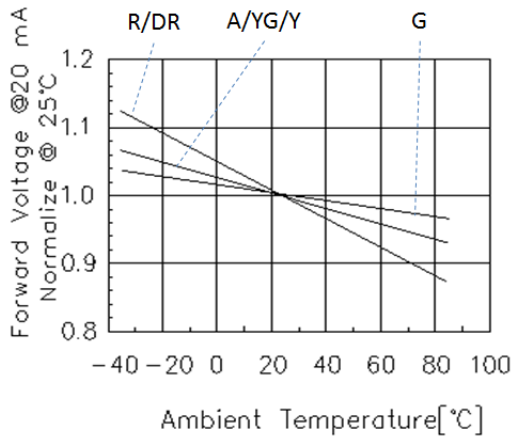


Fig 3. Forward Voltage vs. Temperature

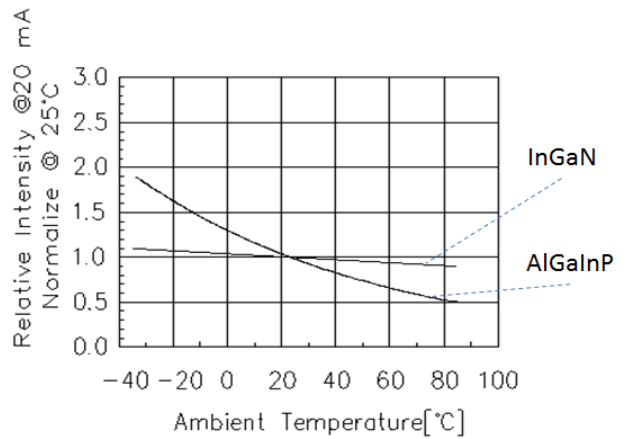


Fig 4. Relative Intensity vs. Temperature

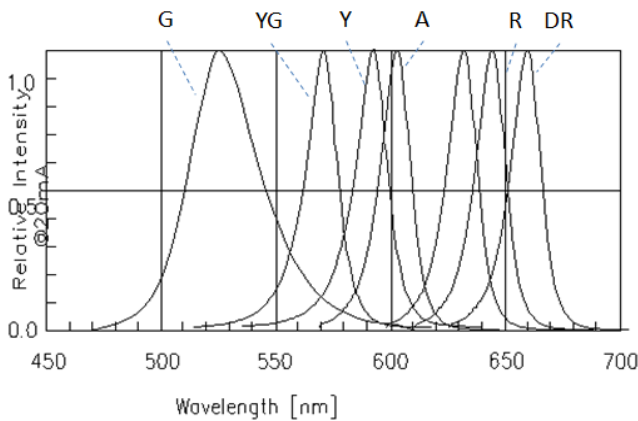


Fig 5. Relative Intensity vs. Wavelength

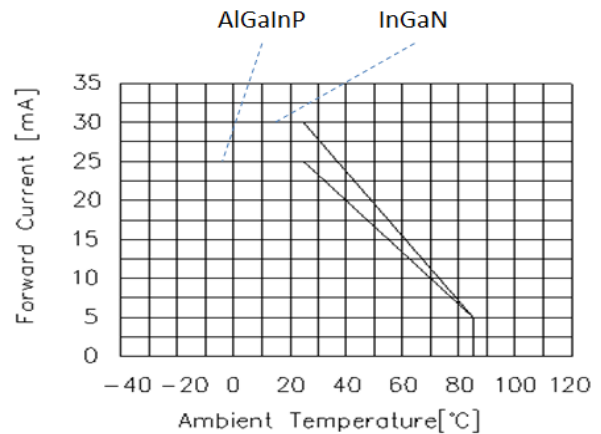


Fig 6. Forward current vs. Temperature

Characteristic Curves for B


Fig 1. Forward Current vs. Forward Voltage

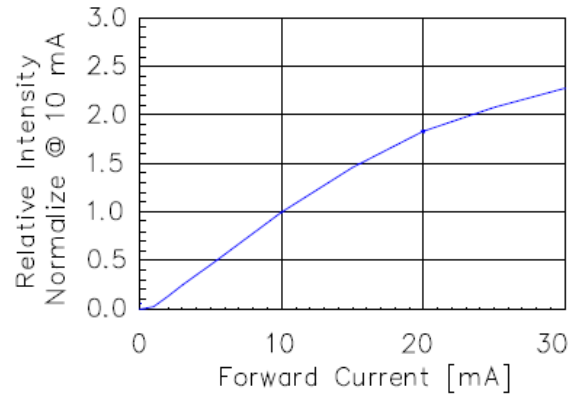


Fig 2. Relative Intensity vs. Forward Current

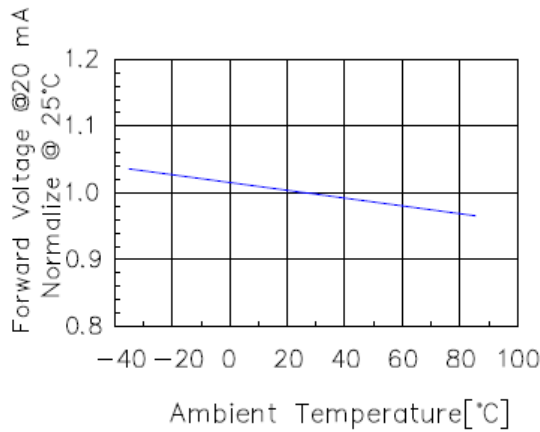


Fig 3. Forward Voltage vs. Temperature

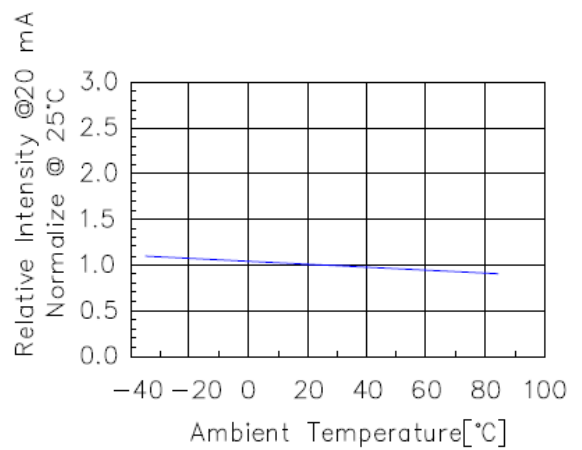


Fig 4. Relative Intensity vs. Temperature

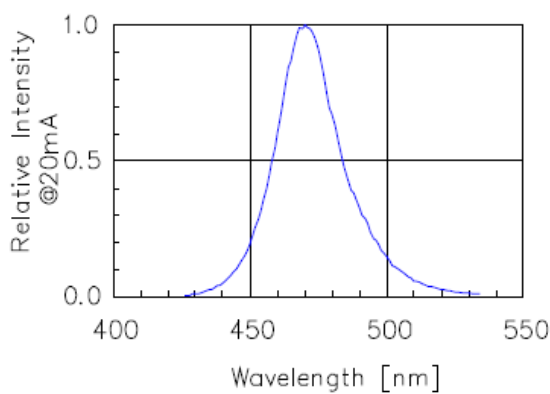


Fig 5. Relative Intensity vs. Wavelength

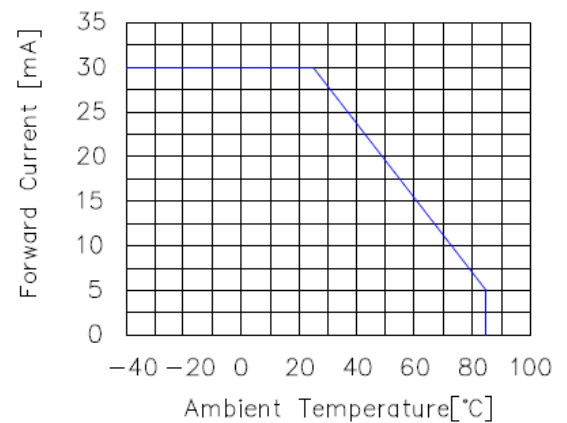


Fig 6. Forward current vs. Temperature

Characteristic Curves for W

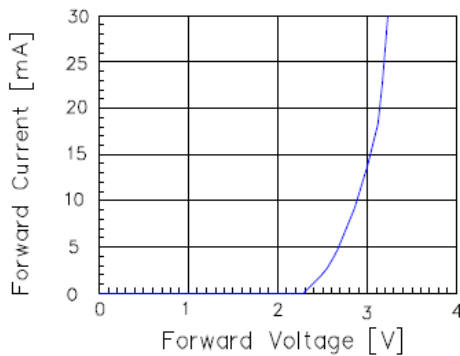


Fig 1. Forward Current vs. Forward Voltage

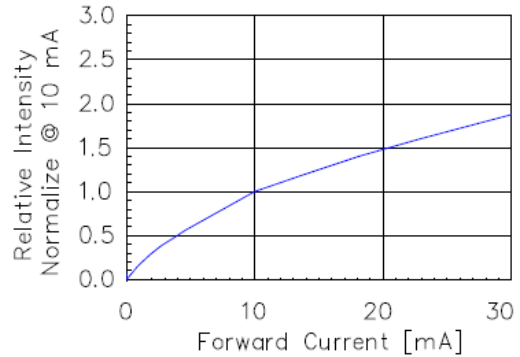


Fig 2. Relative Intensity vs. Forward Current



Fig 3. Forward Voltage vs. Temperature

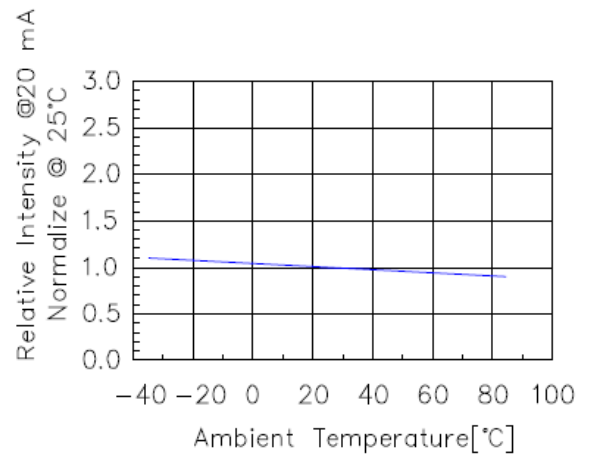


Fig 4. Relative Intensity vs. Temperature

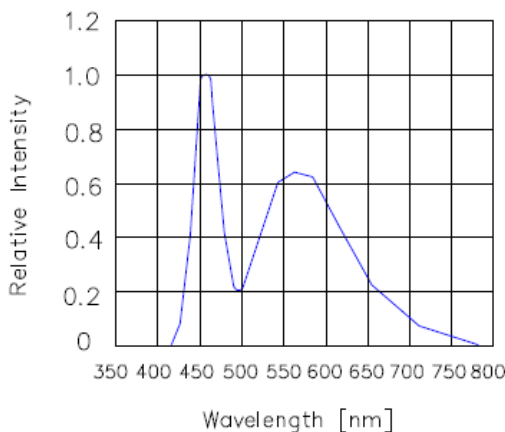


Fig 5. Relative Intensity vs. Wavelength

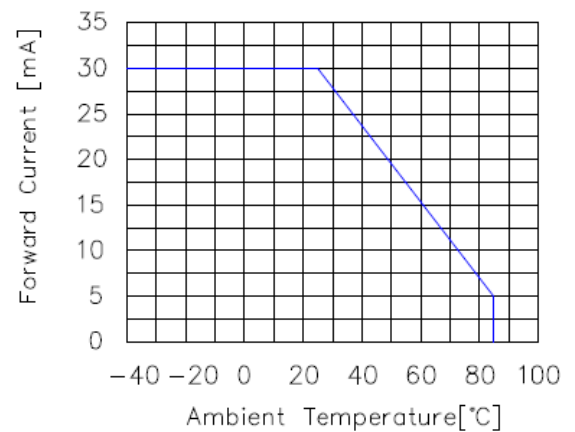


Fig 6. Forward current vs. Temperature

Chromaticity Bin (for White only)


B1				
X	0.240	0.240	0.260	0.260
Y	0.225	0.258	0.275	0.240

B2				
X	0.240	0.240	0.260	0.260
Y	0.195	0.225	0.240	0.210

C1				
X	0.260	0.260	0.280	0.280
Y	0.240	0.275	0.293	0.257

C2				
X	0.260	0.260	0.280	0.280
Y	0.210	0.240	0.257	0.227

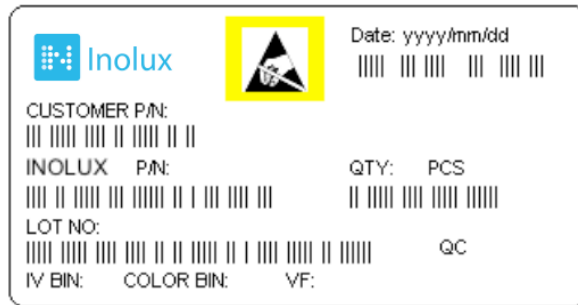
D1				
X	0.280	0.280	0.300	0.300
Y	0.244	0.293	0.310	0.260

Ordering Information

Product	Emission Color	Technology	I*V(mcd) @10mA	VF(V) @20mA	Polarity	Face Color	Orderable Part Number
INND-TS230YGXX	Yellow Green	AlGaInP	110	8(4)	Common Anode	Black	INND-TS230YGAB
					Common Cathode	Black	INND-TS230YGCB
					Common Anode	Grey	INND-TS230YGAG
					Common Cathode	Grey	INND-TS230YGCG
INND-TS230YXX	Yellow	AlGaInP	283	8(4)	Common Anode	Black	INND-TS230YAB
					Common Cathode	Black	INND-TS230YCB
					Common Anode	Grey	INND-TS230YAG
					Common Cathode	Grey	INND-TS230YCG
INND-TS230AXX	Amber	AlGaInP	314	8(4)	Common Anode	Black	INND-TS230AAB
					Common Cathode	Black	INND-TS230ACB
					Common Anode	Grey	INND-TS230AAG
					Common Cathode	Grey	INND-TS230ACG
INND-TS230RXX	Red	AlGaInP	141	8(4)	Common Anode	Black	INND-TS230RAB
					Common Cathode	Black	INND-TS230RCB
					Common Anode	Grey	INND-TS230RAG
					Common Cathode	Grey	INND-TS230RCG

Product	Emission Color	Technology	I*V(mcd) @10mA	VF(V) @20mA	Polarity	Face Color	Orderable Part Number
INND-TS230DRXX	Deep Red	AlGaInP	114	8(4)	Common Anode	Black	INND-TS230DRAB
					Common Cathode	Black	INND-TS230DRCB
					Common Anode	Grey	INND-TS230DRAG
					Common Cathode	Grey	INND-TS230DRCG
INND-TS230GX	Green	InGaN	1413	12.8(6.4)	Common Anode	Black	INND-TS230GAB
					Common Cathode	Black	INND-TS230GCB
					Common Anode	Grey	INND-TS230GAG
					Common Cathode	Grey	INND-TS230GCG
INND-TS230BXX	Blue	InGaN	195	9.6(3.2)	Common Anode	Black	INND-TS230BAB
					Common Cathode	Black	INND-TS230BCB
					Common Anode	Grey	INND-TS230BAG
					Common Cathode	Grey	INND-TS230BCG
INND-TS230WXX	White	InGaN	600	9.6(3.2)	Common Anode	Black	INND-TS230WAB
					Common Cathode	Black	INND-TS230WCB
					Common Anode	Grey	INND-TS230WAG
					Common Cathode	Grey	INND-TS230WCG

Label Specifications



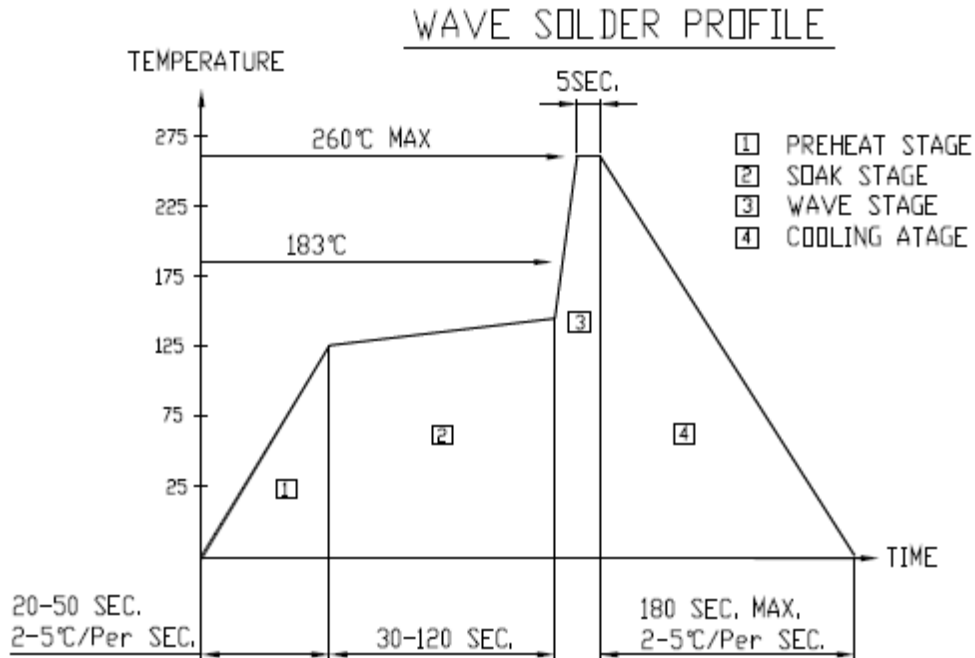
Inolux P/N:

I	N	N	D	-	T	S	2	3	0	X	X	X	-	X	X	X	X
Inolux		Display Type	Display Type	Dimension			Color	Polarity	Face Color	Customized Stamp-off							
		ND = Numeri c Display	T: Through hole S: Single	230 = 2.3" Display Height			YG: 570 nm Y: 590 nm A: 605 nm R: 624 nm DR: 660 nm G: 520 nm B: 470 nm W: X: 0.27 Y: 0.25	A = Common Anode C=Common Cathode	B = Black G = Grey								

Lot No.:

Z	2	0	1	7	01	24	001
Internal Tracker	Year (2017, 2018,)				Month	Date	Serial

Reflow Soldering



Soldering Iron

Basic Spec is ≤ 4 sec. when 260°C (+10°C \rightarrow -1 second). Power dissipation of Iron should be less than 15W. Surface temperature should be under 230°C

Rework

Rework should be completed within 4 second under 245°C

Revision History

Changes since last revision	Page	Version No.	Revision Date
Initial Release		1.0	12-26-2019

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