

Features

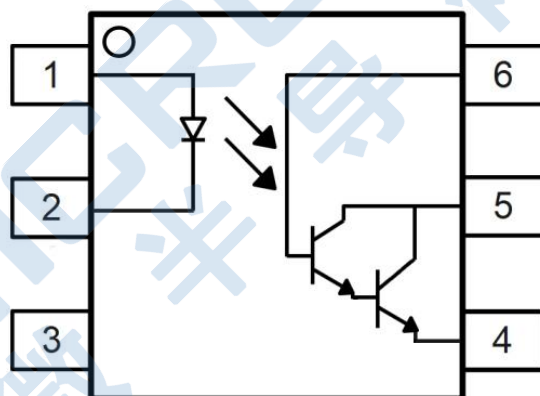
- High isolation 5000 VRMS
- DC input with transistor output
- Operating temperature range - 40 °C to 110 °C
- RoHS & REACH Compliance
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC - GB4943.1

Applications

- Low power logic circuits
- Telecommunications equipment
- Portable electronics
- Interfacing coupling systems of different potentials and impedances

Description

The 4N32, 4N33 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar darlington phototransistor detector in a plastic DIP6 package with different lead forming options.



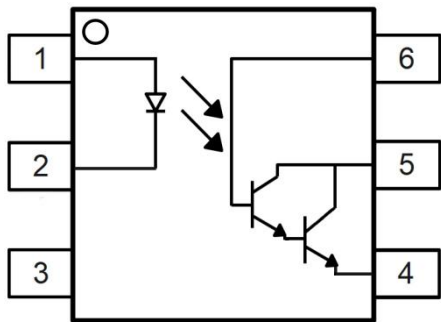
ORDERING INFORMATION

Outline	Part Number	Package	Marking	Packing	Packing Size	Quantity
	4NXX-000E	DIP6	4NXX /YYWW A	Tube	500mm	65
	4NXX-100E	DIP6-M		Tube	500mm	65
	4NXX-500E	DIP6-SL		Reel	13 "	1000

CONTENTS

Pin Configuration And Functions.	3
Absolute Maximum Ratings.	3
Electrical Optical Characteristics.	4
Transfer Characteristics.	5
Characteristic Curves.	6
Test Circuits.	8
Package Dimensions.	9
Recommended SoldeMask.	10
Carrier Tape Specifications.	11
Ordering And Marking Information.	12
Reflow Information.	13
Temperature Profile Of Soldering.	14
Disclaimer.	15

PIN CONFIGURATION AND FUNCTIONS

	Pin	Name
	1	Anode
	2	Cathode
	3	NC
	4	Emitter
	5	Collector
	6	Base

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	Note
INPUT				
Forward Current	I_F	60	mA	
Peak Forward Current($t=10\mu s$)	I_{FP}	1	A	1
Reverse Voltage	V_R	6	V	
Power Dissipation($T_a=25^\circ C$)	P_D	120	mW	
OUTPUT				
Collector - Emitter Voltage	V_{CEO}	55	V	
Collector-Base Breakdown Voltage	V_{CBO}	55	V	
Emitter - Collector Voltage	V_{ECO}	7	V	
Emitter-Base Breakdown Voltage	V_{EBO}	7	V	
Collector Current	I_C	150	mA	
Power Dissipation($T_a=25^\circ C$)	P_C	150	mW	
COMMON				
Total Power Dissipation	P_{TOT}	200	mW	
Isolation Voltage	V_{ISO}	5000	Vrms	2
Operating Temperature	T_{opr}	-40~+110	$^\circ C$	
Storage Temperature	T_{stg}	-55~+125	$^\circ C$	
Soldering Temperature	T_{sol}	260	$^\circ C$	

Note 1. AC For 1 Minute, R.H. = 40 ~ 60%

Note 2. For 10 seconds

ELECTRICAL OPTICAL CHARACTERISTICS(T_a=25°C)

Parameter	Symbol	Min	Typ.	Max	Unit	Test Condition	Note
INPUT							
Forward Voltage	V _F	-	1.24	1.4	V	I _F =10mA	
Reverse Current	I _R	-	-	10	μA	V _R =6V	
Input Capacitance	C _{in}	-	50	-	pF	V=0, f=1kHz	
OUTPUT							
Collector Dark Current	I _{CEO}	-	-	100	nA	V _{CE} =10V	
Collector-Emitter Breakdown Voltage	BV _{CEO}	55	-	-	V	I _C =0.1mA	
Collector-Base Breakdown Voltage	BV _{CBO}	55	-	-	V	I _C =0.1mA	
Emitter-Collector Breakdown Voltage	BV _{ECO}	7	-	-	V	I _E =0.1mA	
Emitter-Base Breakdown	BV _{EBO}	7	-	-	V	I _E = 0.1mA, I _F =0	

TRANSFER CHARACTERISTICS

Parameter	Symbol	Min	Typ.	Max	Unit	Test Condition	Note
Current Transfer Ratio	CTR	500	-	-	%	$I_F=10\text{mA}$, $V_{CE}=10\text{V}$	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	-	1.0	V	$I_F=8\text{mA}$, $I_C=2\text{mA}$	
Isolation Resistance	R_{IO}	10^{11}	-	-	Ω	$V_{IO}=500\text{Vdc}$	
Floating Capacitance	C_{IO}	-	0.8	-	pF	$V=0$, $f=1\text{MHz}$	
Turn On Time	t_{on}	-	-	5	μs	$I_C=10\text{mA}$, $V_{CC}=2\text{V}$, $R_L=100\Omega$	
Turn Off Time	t_{off}	-	-	100	μs	$I_C=10\text{mA}$, $V_{CC}=2\text{V}$, $R_L=100\Omega$	

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

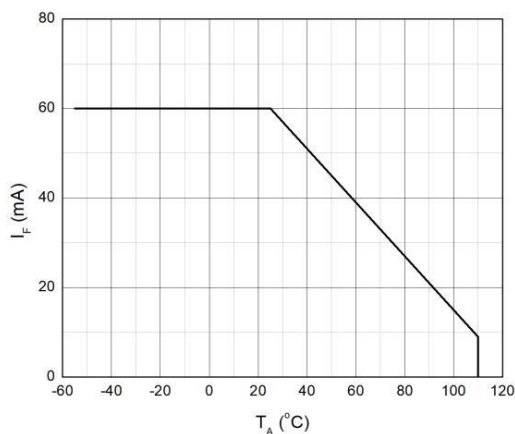


Fig.2 Collector Power Dissipation vs. Ambient Temperature

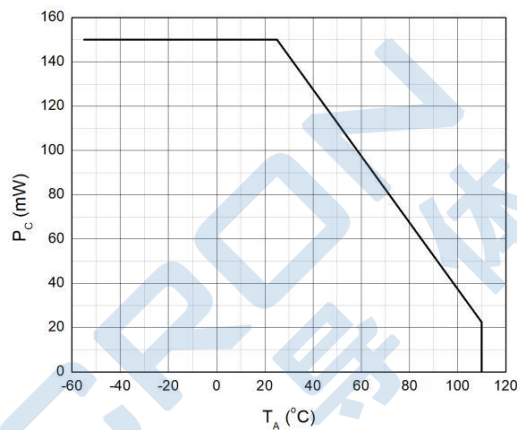


Fig.3 Forward Current vs. Forward Voltage

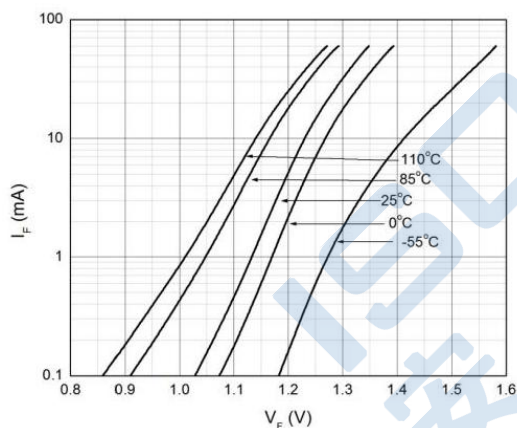


Fig.4 Collector Dark Current vs. Ambient Temperature

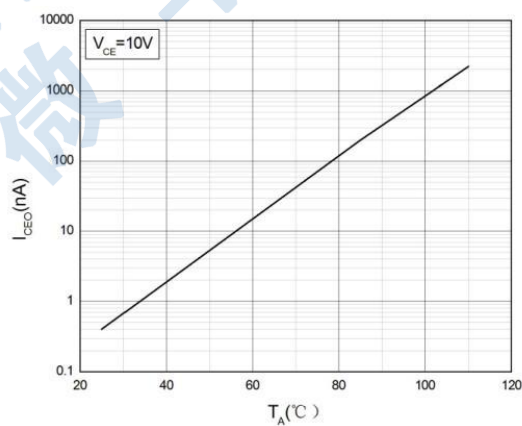


Fig.5 Collector Current vs. Collector-emitter Voltage

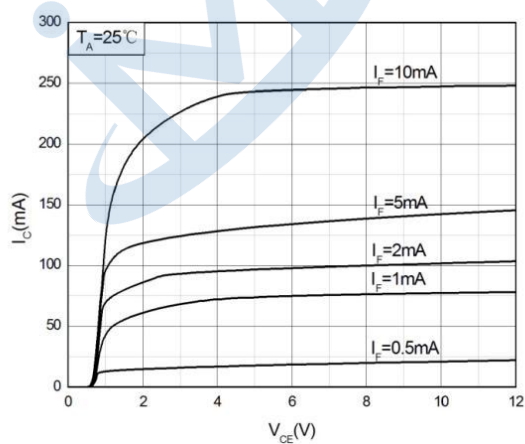


Fig.6 Collector Current vs. Collector-emitter Voltage

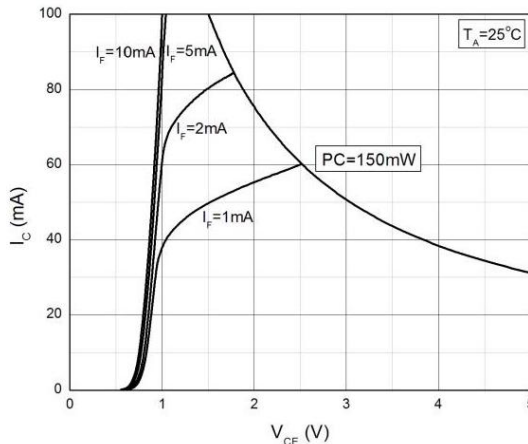
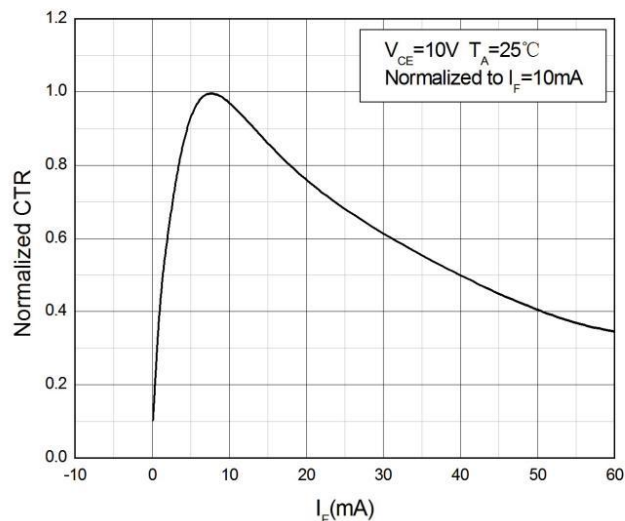
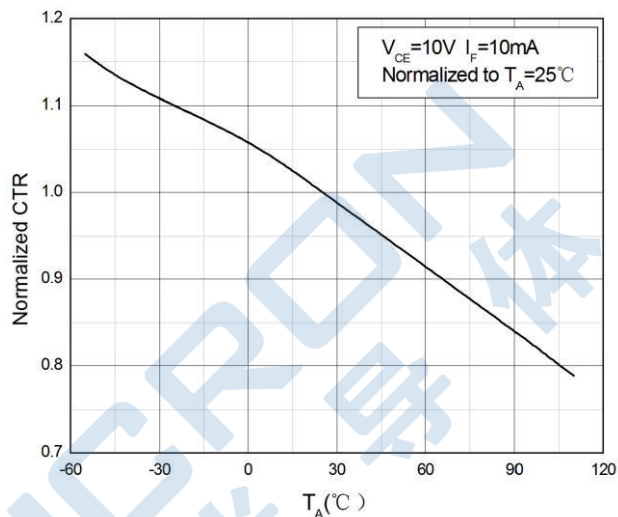
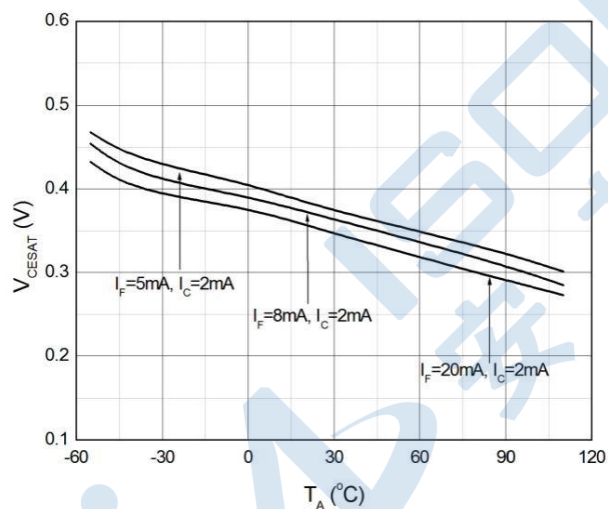
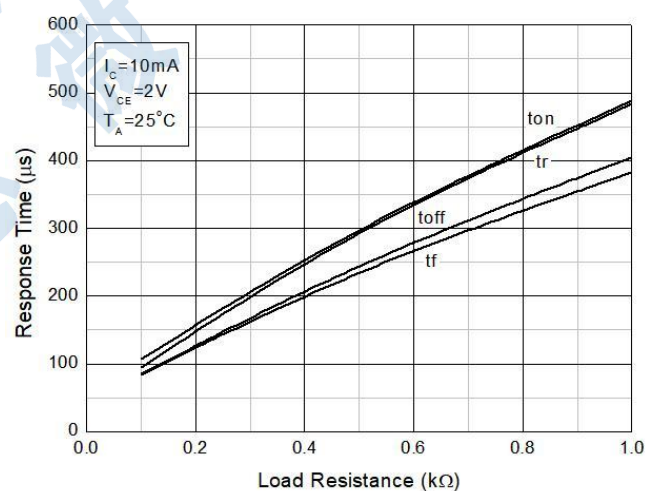


Fig.7 Normalized Current Transfer Ratio vs. Forward Current

Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

Fig.10 Switching Time vs. Load Resistance


TEST CIRCUITS

Fig.11 Test Circuits of Response Time

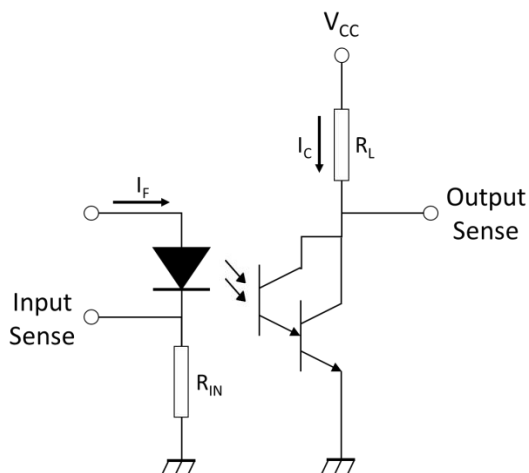


Fig.12 Curves of Response Time

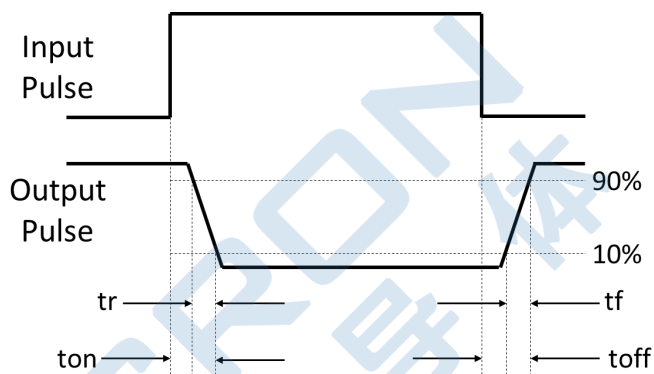
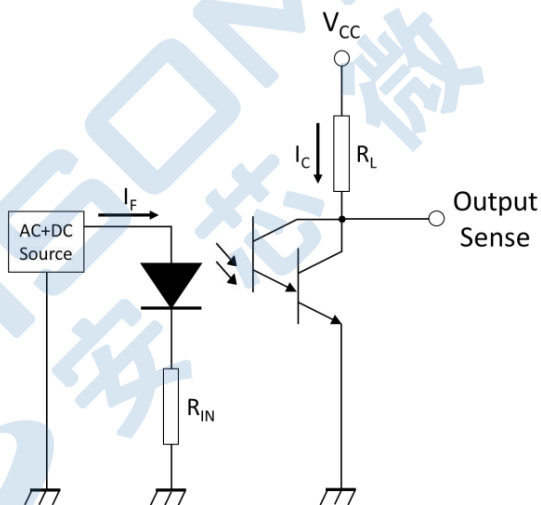
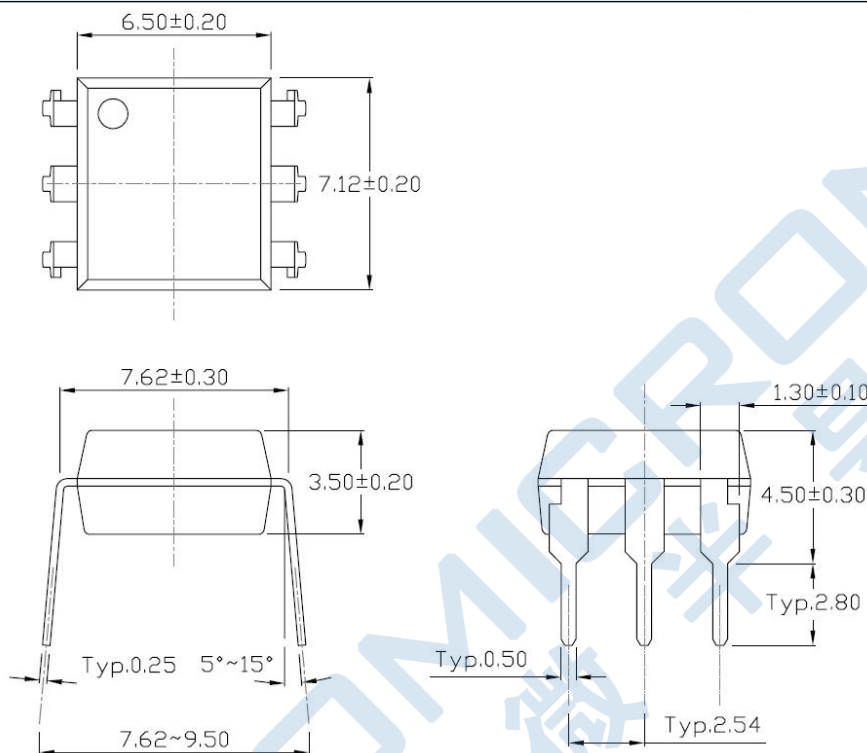


Fig.13 Test Circuits of Frequency Response

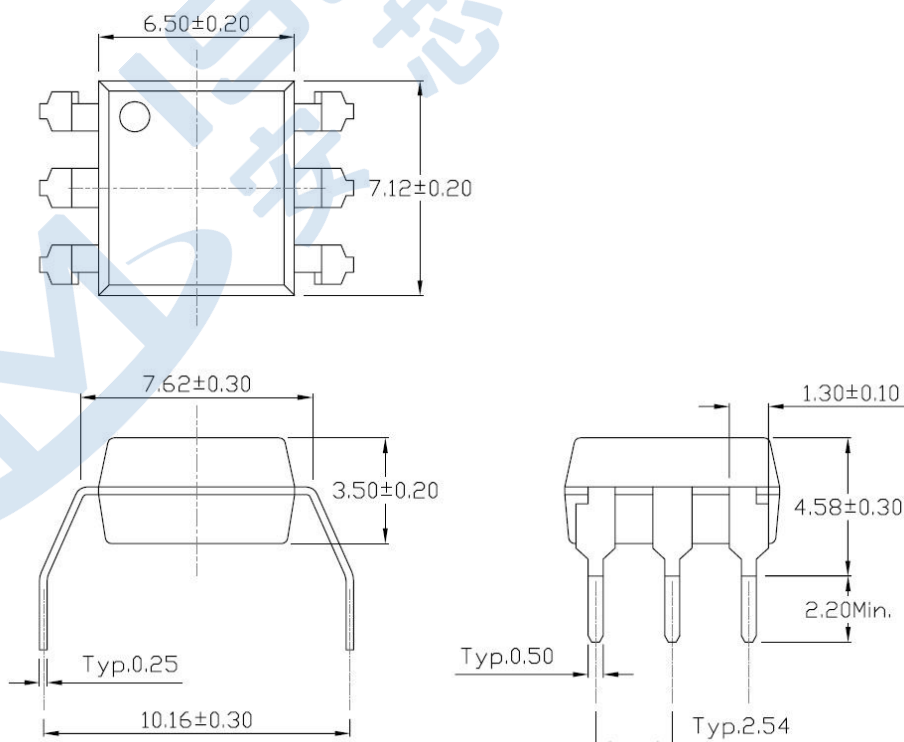


PACKAGE DIMENSIONS

Standard DIP – Through Hole (DIP Type)

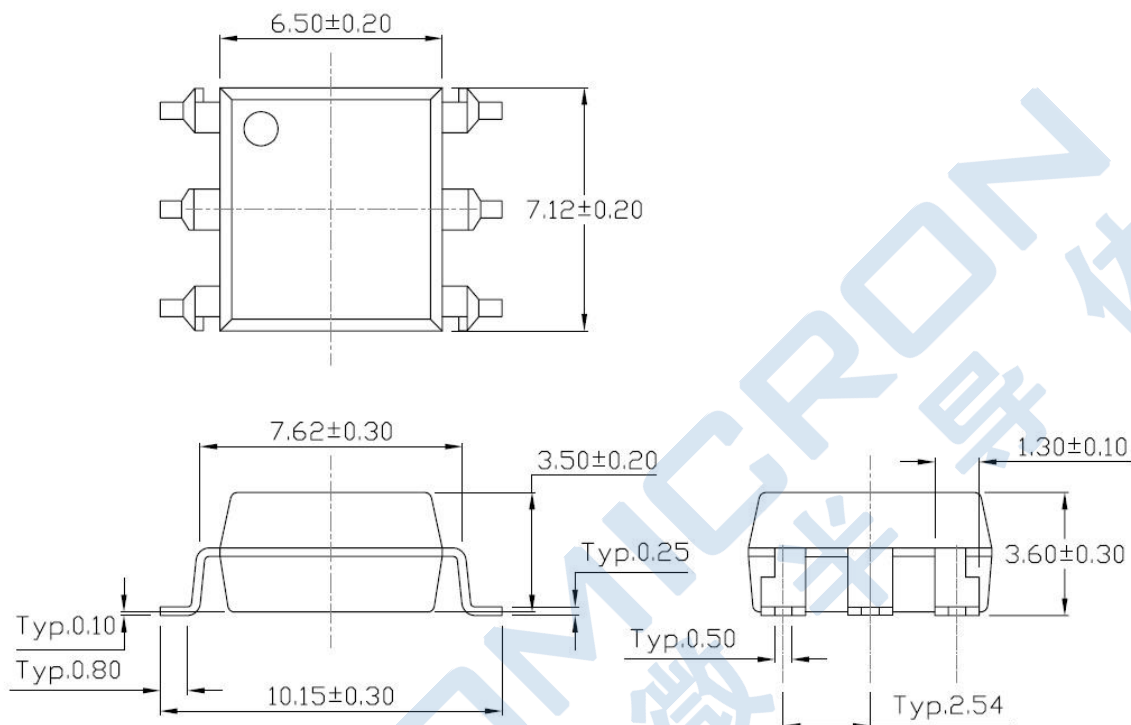


Gullwing (400mil) Lead Forming – Through Hole (M Type)



PACKAGE DIMENSIONS

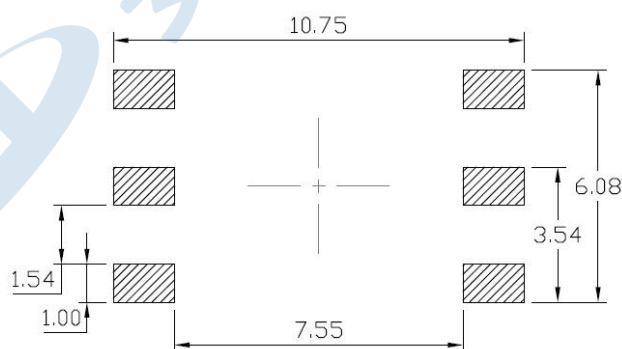
Surface Mount (Low Profile) Lead Forming (SL Type)



- Dimensions in mm unless otherwise stated

Recommended Solder Mask

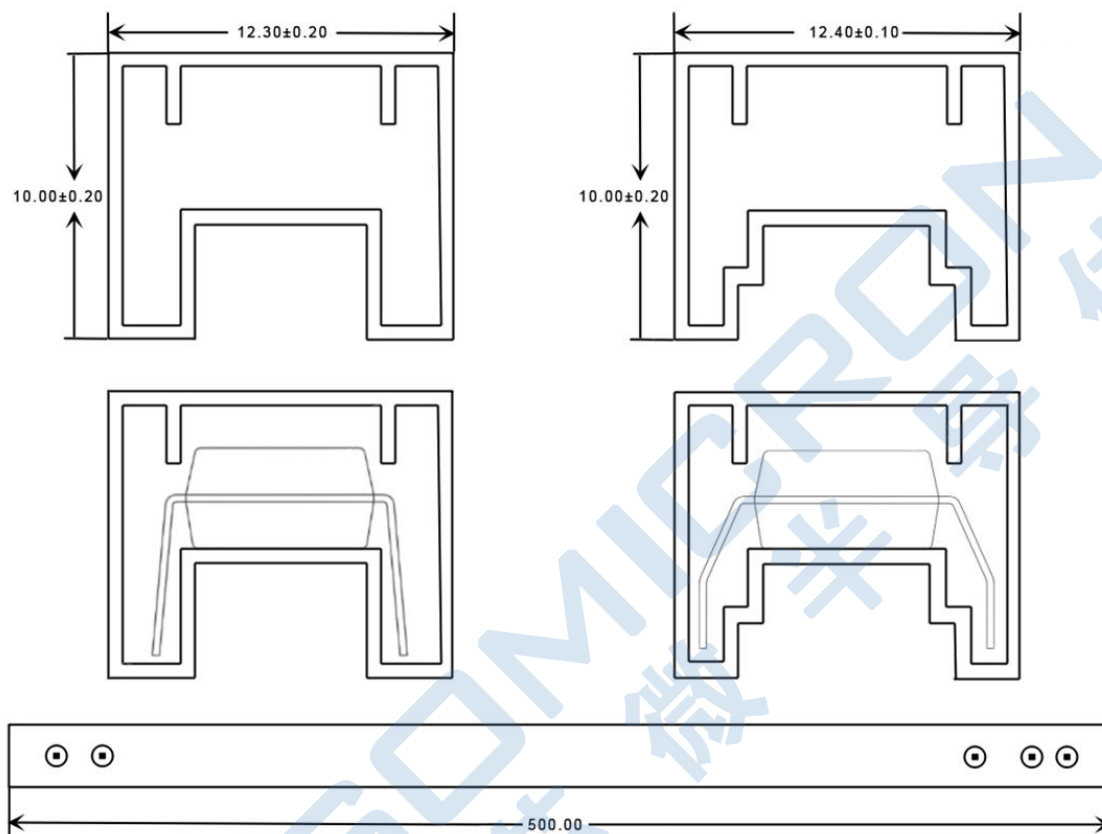
Surface Mount (Low Profile) Lead Forming



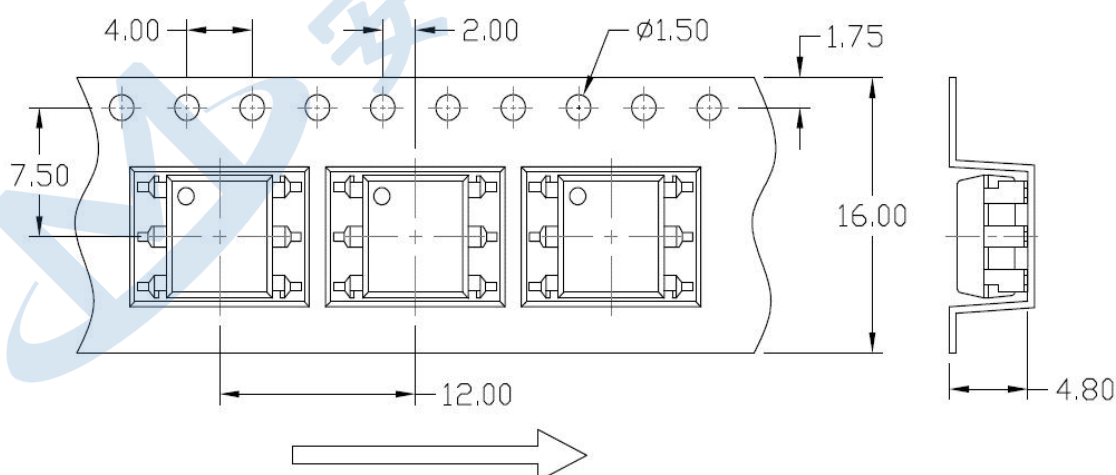
- Dimensions in mm unless otherwise stated

CARRIER TAPE SPECIFICATIONS

Option DIP6 & DIP6-M



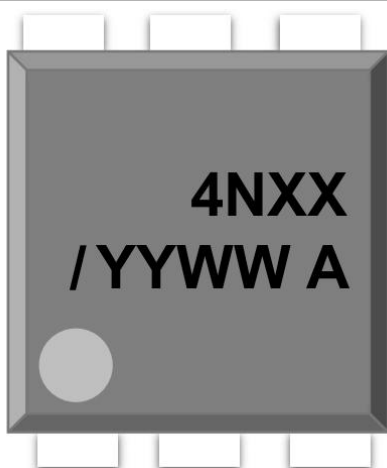
Option DIP6-SL



● Dimensions in mm unless otherwise stated
4N32/4N33

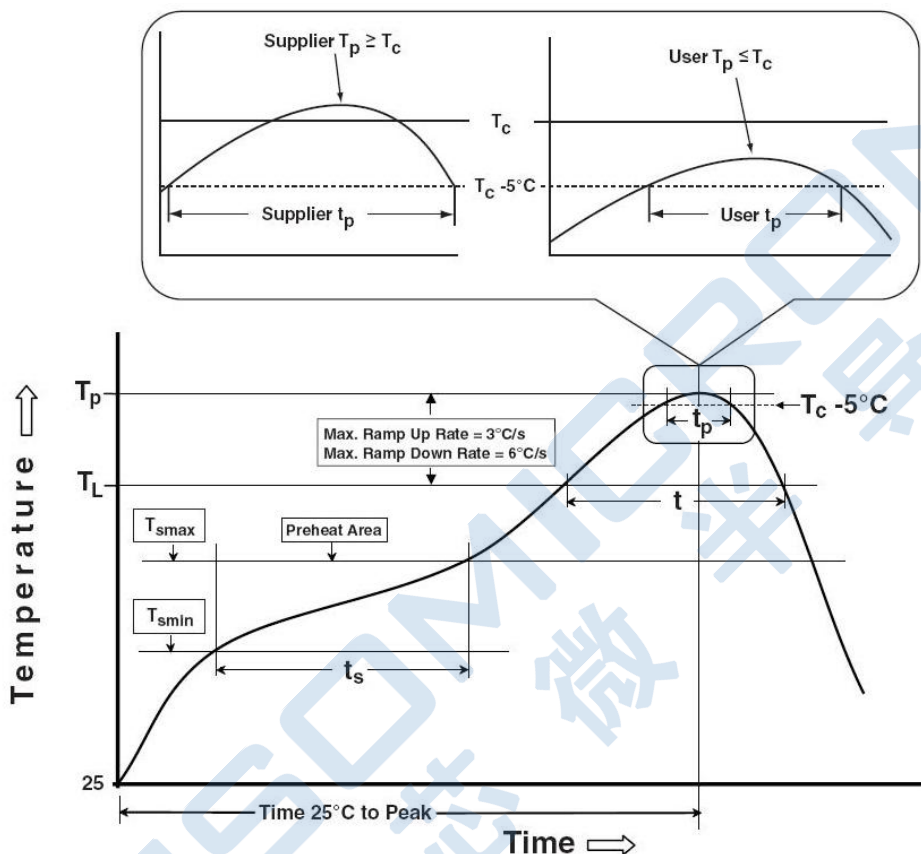
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ORDERING AND MARKING INFORMATION

Marking Information			
		4NXX : Product Series & Rank / : ISOMICRON YY : Fiscal Year WW : Work Week A : Manufacturing Code	
Order Code			
4NXX - XXXX Product Series Rank 32/33 Lead Forming 0: DIP-Standard 1: DIP-M Type 5: SM-SL Type Halogen Free E: Halogen-free, Lead-free Z: Halogen, Lead-free CTR Rank Performance 0: Normal 1: Enhanced 2: Industrial level 3: Auto level 4: Military level			
Packing Quantity			
Option	Quantity	Quantity – Inner box	Quantity – Outer box
DIP-Standard	65 Units/Tube	20 Tubes/Inner box	6 Inner box/Outer box = 7.8k Units
DIP-M	65 Units/Tube	20 Tubes/Inner box	6 Inner box/Outer box = 7.8k Units
SM-SL	1000 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box = 10k Units

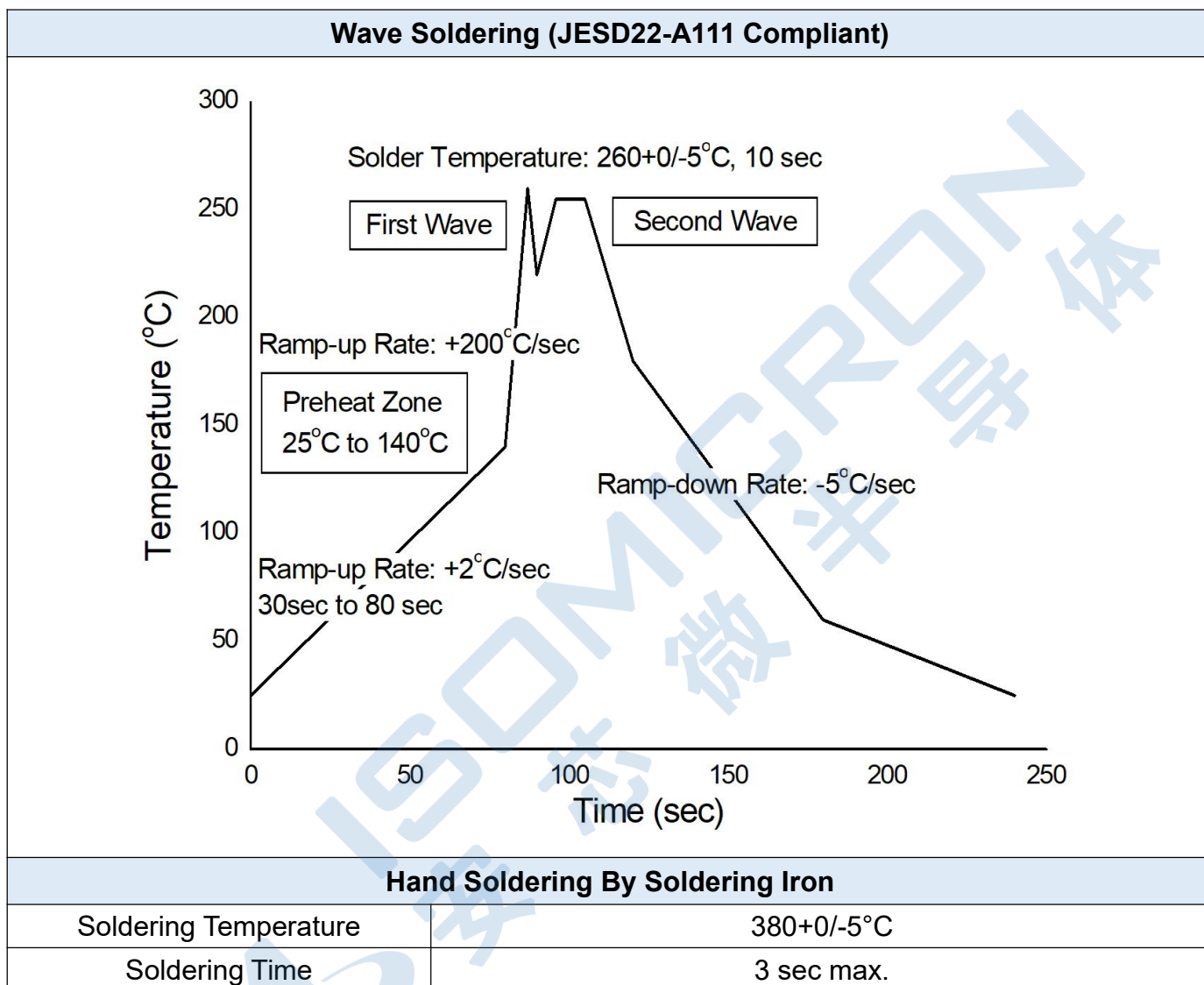
REFLOW INFORMATION

Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100	150°C
Temperature Max. (Tsmax)	150	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

TEMPERATURE PROFILE OF SOLDERING



- One time soldering is recommended for all soldering method.
- Do not solder more than three times for IR reflow soldering.

DISCLAIMER

- ISOMICRON is continually improving the quality, reliability, function and design. ISOMICRON reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
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- Please contact ISOMICRON sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
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- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.