Features

- 214: 4 pin, single channel (1 form A)
- 224: 8 pin, dual channel (2 form A)
- Normally opened (SPST)
- Control 400V AC or DC voltage
- Switch 120mA load
- Controls low-level analog signal
- High sensitivity, low on-resistance
- Low-level off state leakage current
- High isolation voltage 5000Vrms
- Lead free, meet RoHS standards

Applications

- Communications products (Personal computers, Laptops)
- Modem/Sensor
- Mobile phones/Security equipment
- Measuring and Testing equipment
- Plant automation equipment
- High-speed inspection machines

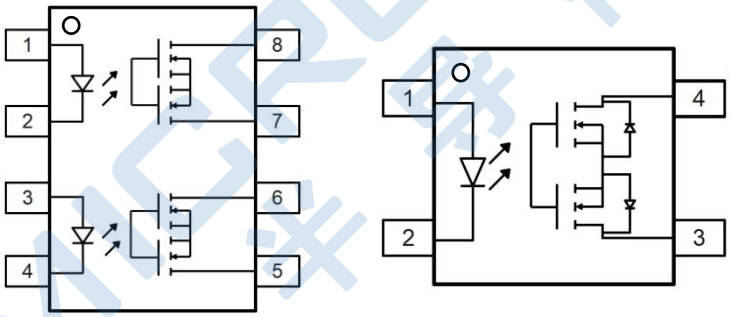
Description

The ICPR214/224 series Photo Relay consist of photo MOSFET、Photoelectric voltage generator and infrared LED.

The ICPR214/224 series achieves low on-resistance and has a good cost-performance.

ICPR214 is packaged in a 4-pin package (DIP/SMD).

ICPR224 is packaged in a 8-pin package (DIP/SMD).

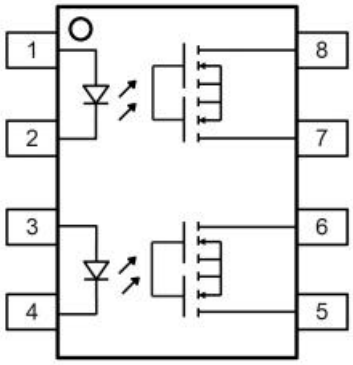


ORDERING INFORMATION

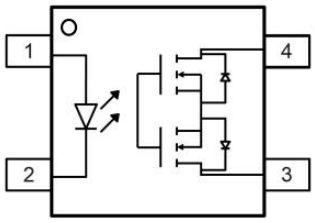
Outline	Part Number	Package	Marking	Packing	Packing Size	Quantity
	ICPR214-400E	DIP4	ICPR 214 /YYWW B	Tube	500mm	100
	ICPR214-450E	DIP4-SL		Reel	13 "	1000
	ICPR224-800E	DIP8	ICPR 224 /YYWW B	Tube	500mm	45
	ICPR224-850E	DIP8-SL		Reel	13 "	1000

CONTENTS

PIN CONFIGURATION AND FUNCTIONS



Pin	Name
1	Anode
2	Cathode
3	Anode
4	Cathode
5	Drain 1
6	Drain 2
7	Drain 3
8	Drain 4



Pin	Name
1	Anode
2	Cathode
3	Drain 1
4	Drain 2

ABSOLUTE MAXIMUM RATINGS

Item			Symbol	Value	Unit	Note
Input	LED forward current		I_F	50	mA	
	LED reverse voltage		V_R	5	V	
	Peak forward current		I_{FP}	1	A	f = 100 Hz duty cycle = 0.1%
	Power dissipation		P	75	mW	
Output	Load Voltage (Peak AC)		V_L	400	V	
	Continuous load current		I_L	0.12	A	
	Peak load current		Ipeak	0.3	A	tm= 1min, duty cycle = 0.1%, cumulative of 5minutes over lifetime
	Power Dissipation	214	P_{OUT}	500	mW	
		224		800	mW	
I/O isolation voltage			V_{iso}	5000	V_{rms}	RH ≤ 50% tm =1minute
Operating Temperature			T_{opr}	–40°C ~ 85°C	°C	
Storage Temperature			T_{stg}	–40°C ~ 100°C	°C	
Soldering Temperature			T_{sol}	260	°C	

ELECTRICAL OPTICAL CHARACTERISTICS (T_a=25°C)

Parameter		Symbol	Min	Typ	Max	Unit	Test Condition
Input	LED operate current	I_{Fon}	-	0.5	3	mA	I_L = 0.12A
	LED turn off current	I_{Foff}	0.1	0.4	-	mA	I_L = 0.12A
	LED dropout Voltage	V_F	1	1.3	1.5	V	I_F= 5mA
Output	On resistance	R_{on}	-	15	20	Ω	I_F= 5mA ; I_L= 0.12A. Within 1s on time
	Off state leakage current	I_{Leak}	-	-	1000	nA	I_F= 0mA； V_L= 400V
Transfer Characteristics	Turn on time*	t_{on}	-	60	2000	us	I_F= 5mA ; I_L=0.12A
	Turn off time*	t_{off}	-	400	1000	us	
	I/O capacitance	C_{iso}	-	0.8	1.5	pF	f = 1 MHz,V_B=0V
	Initial I/O isolation	R_{iso}	1000	-	-	MΩ	500V DC

CHARACTERISTIC CURVES

Fig.1 LED Dropout Voltage vs. Ambient Temperature

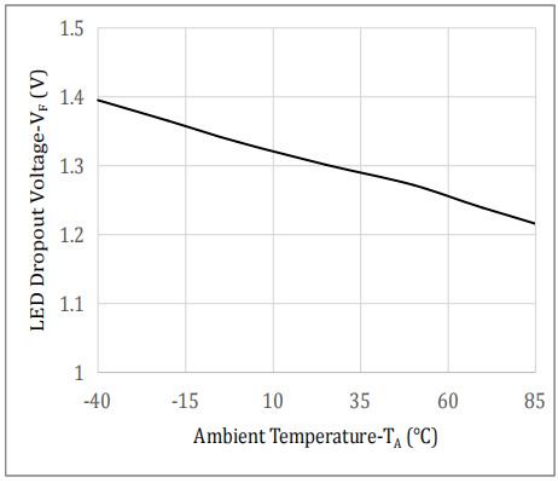


Fig.2 Output Current vs. Output Voltage

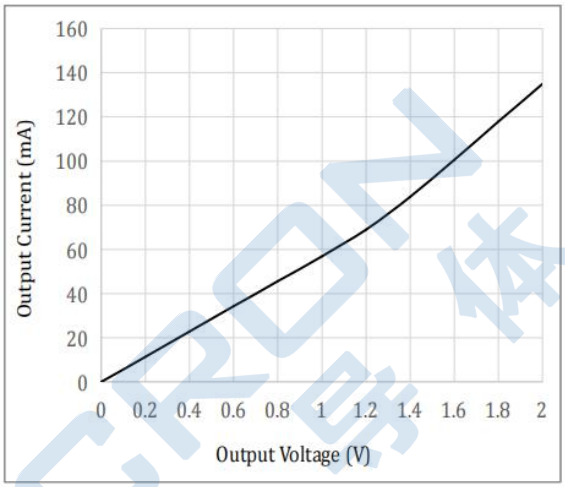


Fig.3 On Resistance vs. Ambient Temperature

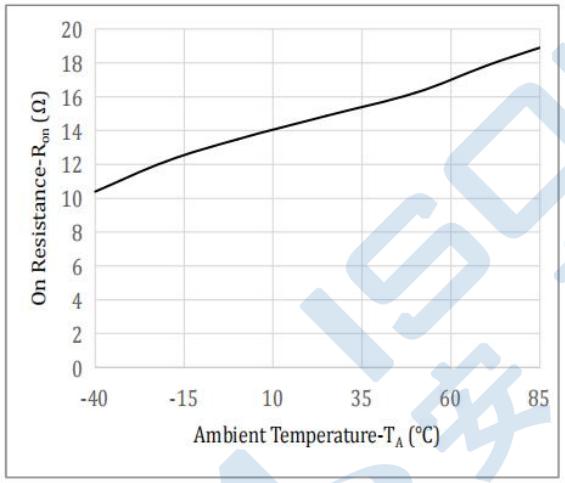


Fig.4 Load Current vs. Ambient Temperature

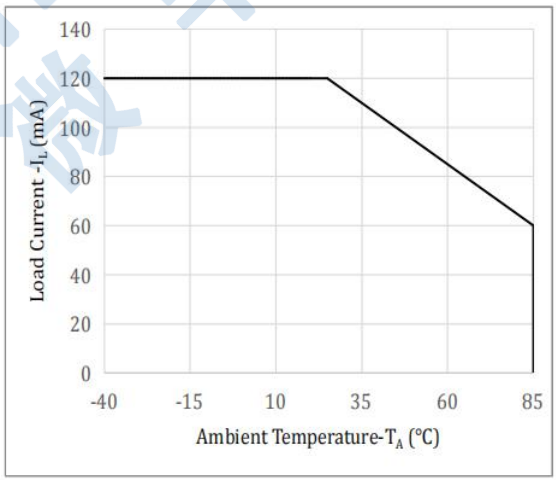


Fig.5 LED Operate Current vs. Ambient Temperature

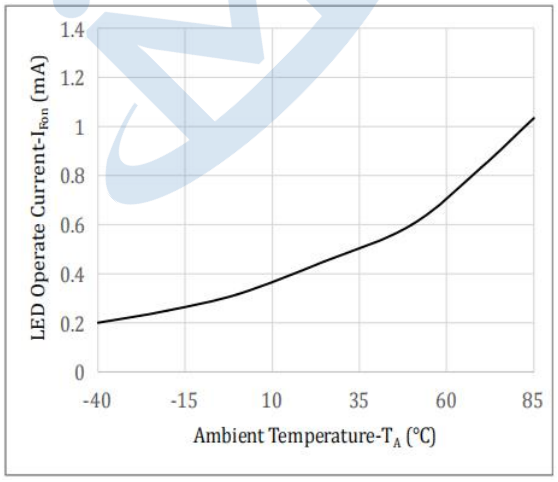


Fig.6 LED Turn Off Current vs. Ambient Temperature

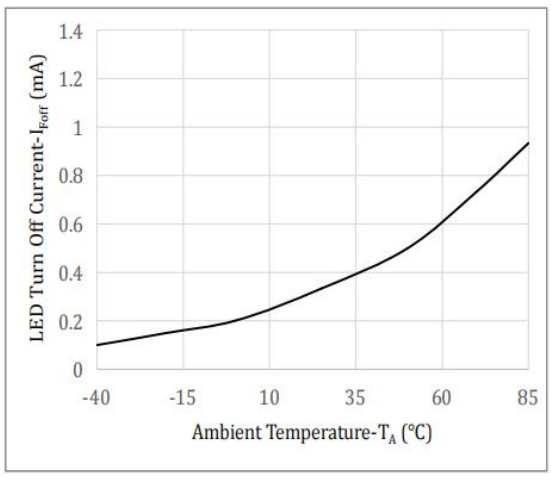


Fig.7 Turn On Time vs. Ambient Temperature

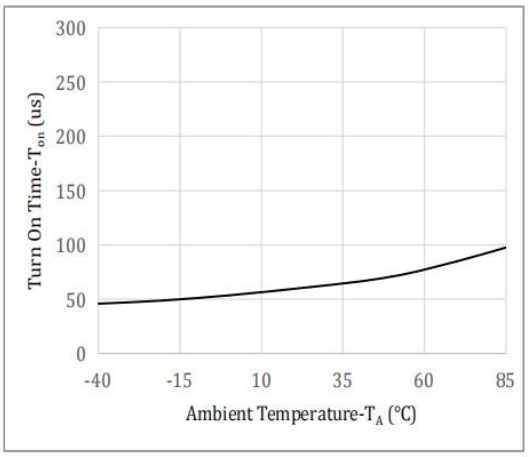


Fig.8 Turn Off Time vs. Ambient Temperature

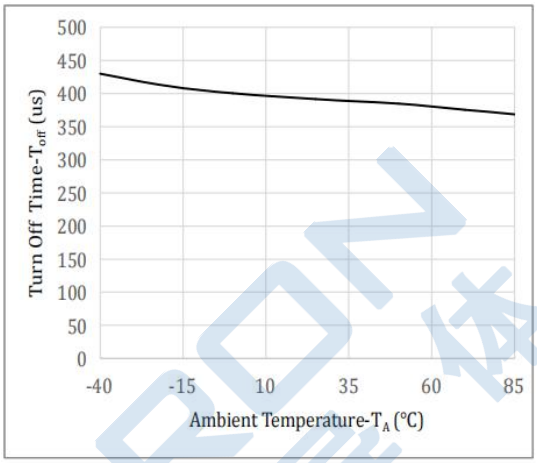


Fig.9 Turn On Time vs. LED Forward Current

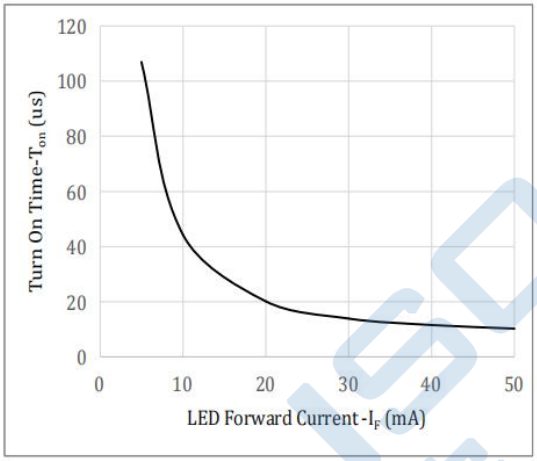


Fig.10 Turn Off Time vs. LED Forward Current

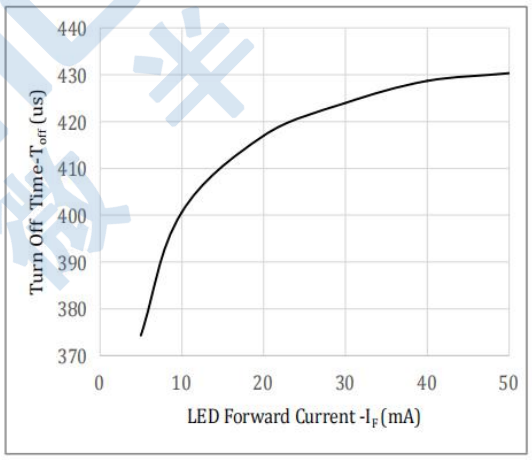
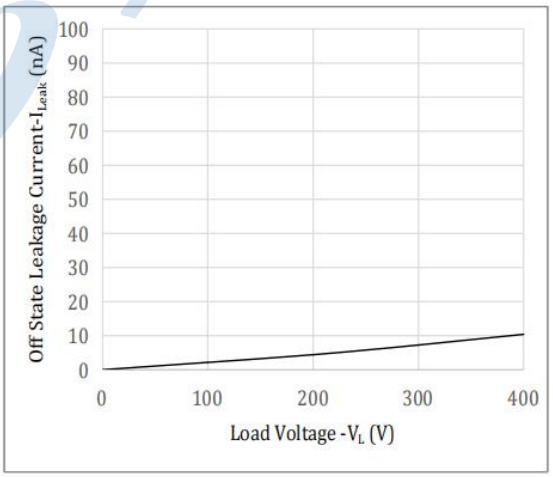
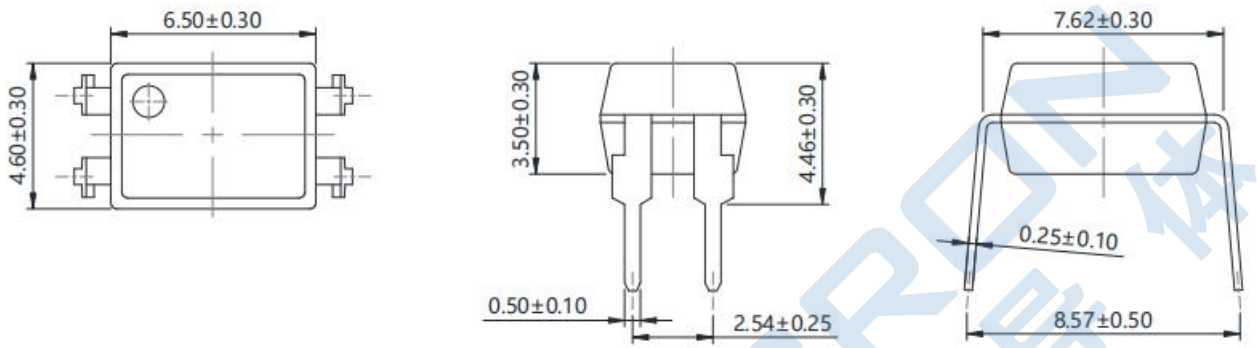


Fig.11 Off State Leakage Current vs Load Voltage

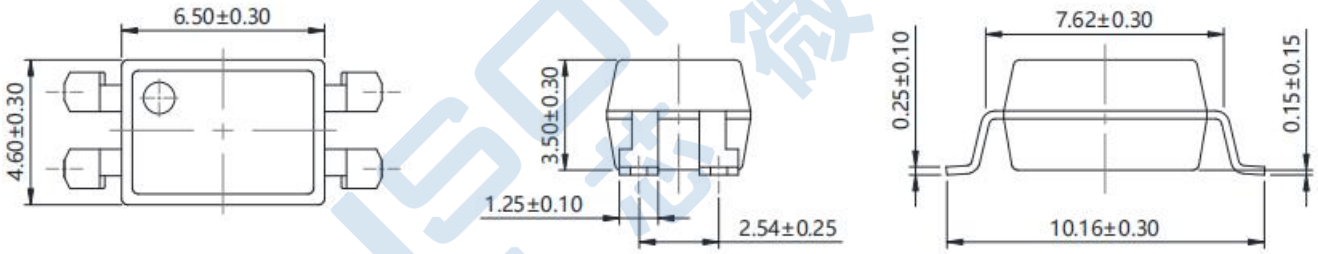


PACKAGE DIMENSIONS

Standard DIP – Through Hole (DIP4)



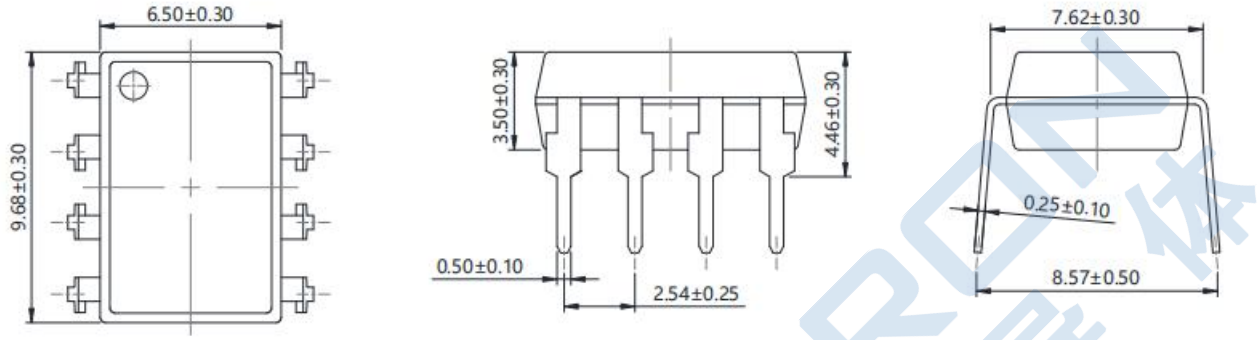
Surface Mount (Low Profile) - (DIP4-SL)



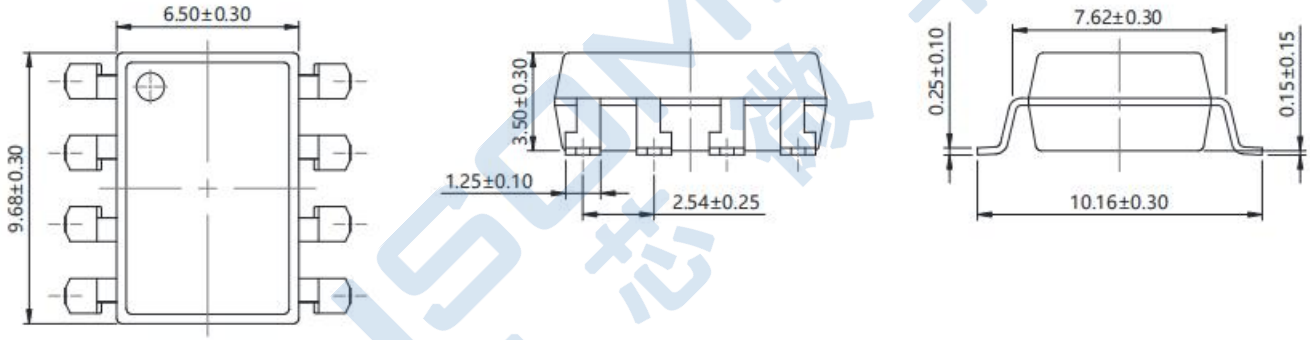
- **Dimensions in mm unless otherwise stated**

PACKAGE DIMENSIONS

Standard DIP – Through Hole (DIP8)



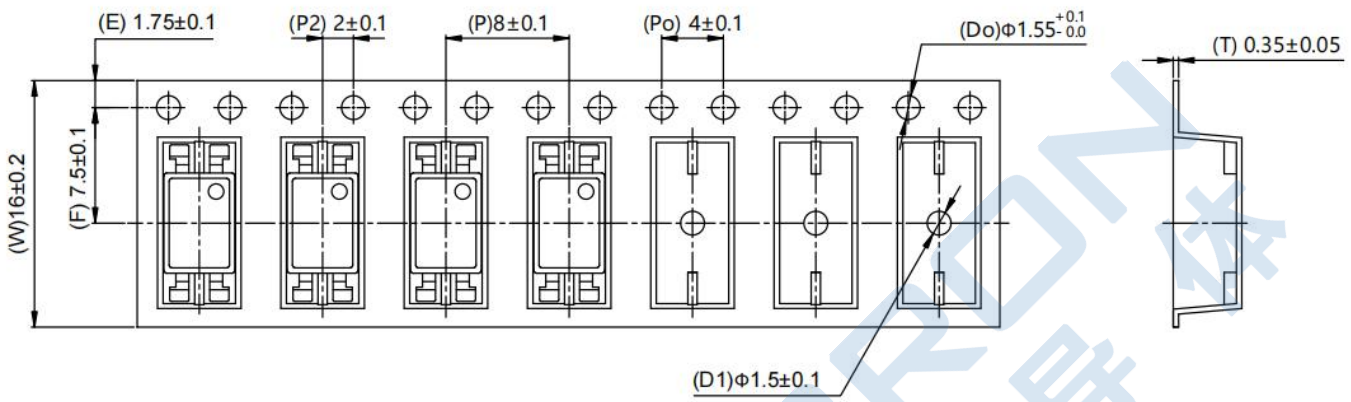
Surface Mount (Low Profile) - (DIP8-SL)



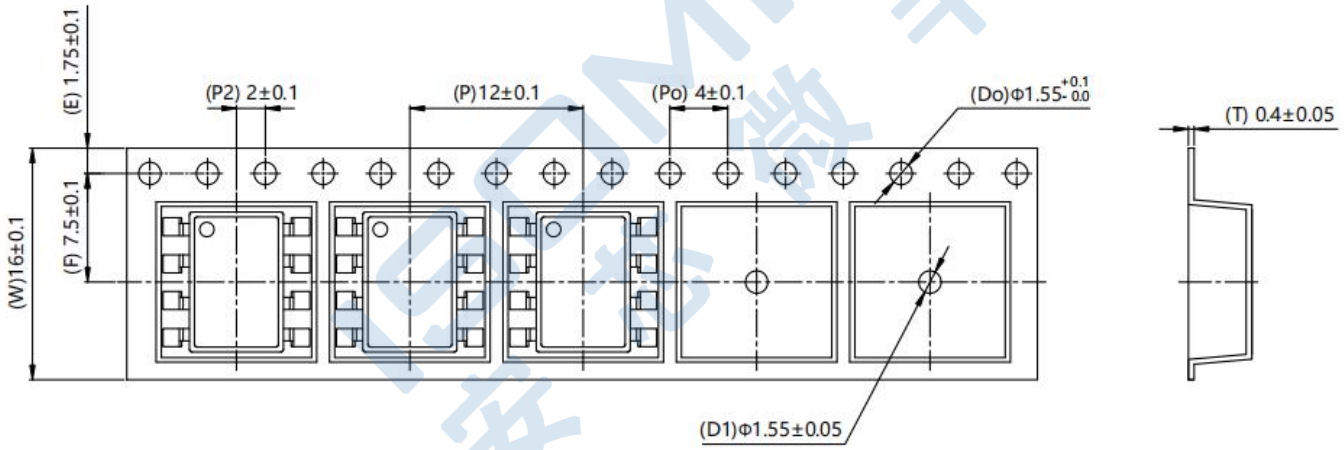
- **Dimensions in mm unless otherwise stated**

CARRIER TAPE SPECIFICATIONS

Option DIP4-SL



Option DIP8-SL



- **Dimensions in mm unless otherwise stated**

ORDERING AND MARKING INFORMATION

Marking Information

ICPR	:	Company Abbr.
214	:	Part Number
/	:	ISOMICRON
YY	:	Fiscal Year
WW	:	Work Week
B	:	Manufacturing Code

Order Code

ICPR 2XY - 4 0 0 E

Company Abbr.

Part Number
X=1: Single channel
2: Dual channel
Y=0~9,Load Voltage

Lead Frame Option
4: Pin4

Halogen Free
E: Halogen-free,Lead-free
Z: Halogen, Lead-free

Performance
0: Normal
1: Enhanced
2: Industrial level
3: Auto level
4: Military level

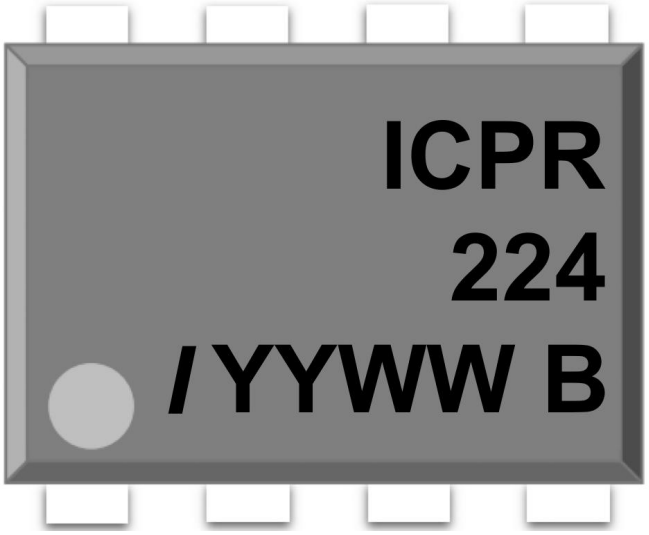
Lead Forming
0: DIP-Standard
5: SM-SL

Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity – Outer box
DIP4	100 Units/Tube	50 Tubes/Inner box	10 Inner box/Outer box = 50k Units
DIP4-SL	2000 Units/Reel	2 Reels/Inner box	10 Inner box/Outer box = 40k Units

ORDERING AND MARKING INFORMATION

Marking Information



ICPR	:	Company Abbr.
222	:	Part Number
/	:	ISOMICRON
YY	:	Fiscal Year
WW	:	Work Week
B	:	Manufacturing Code

Order Code

ICPR 2XY - 8 0 0 E

Company Abbr.

Part Number
X=1: Single channel
2: Dual channel
Y=0~9,Load Voltage

Lead Frame Option
8: Pin8

Halogen Free
E: Halogen-free,Lead-free
Z: Halogen, Lead-free

Performance
0: Normal
1: Enhanced
2: Industrial level
3: Auto level
4: Military level

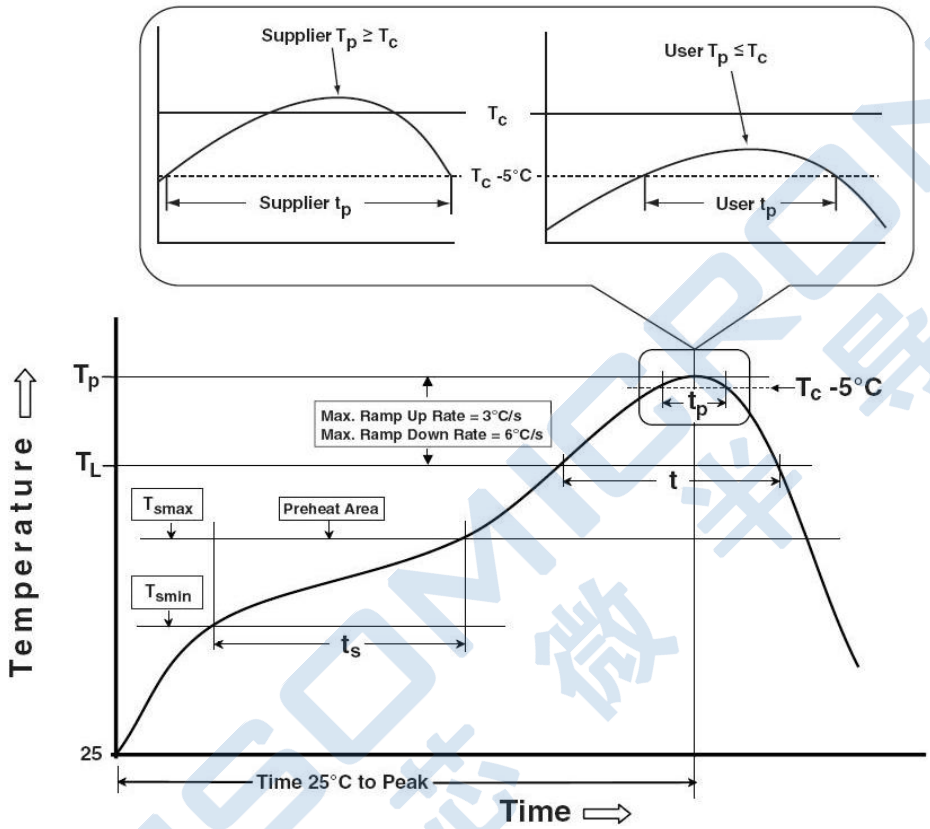
Lead Forming
0: DIP-Standard
5: SM-SL

Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity – Outer box
DIP8	45 Units/Tube	50 Tube/ Inner box	10 Inner box/Outer box=22.5k Units
DIP8-SL	1000 Units/Reel	2 Reels/Inner box	10 Inner box/Outer box = 20k Units

REFLOW INFORMATION

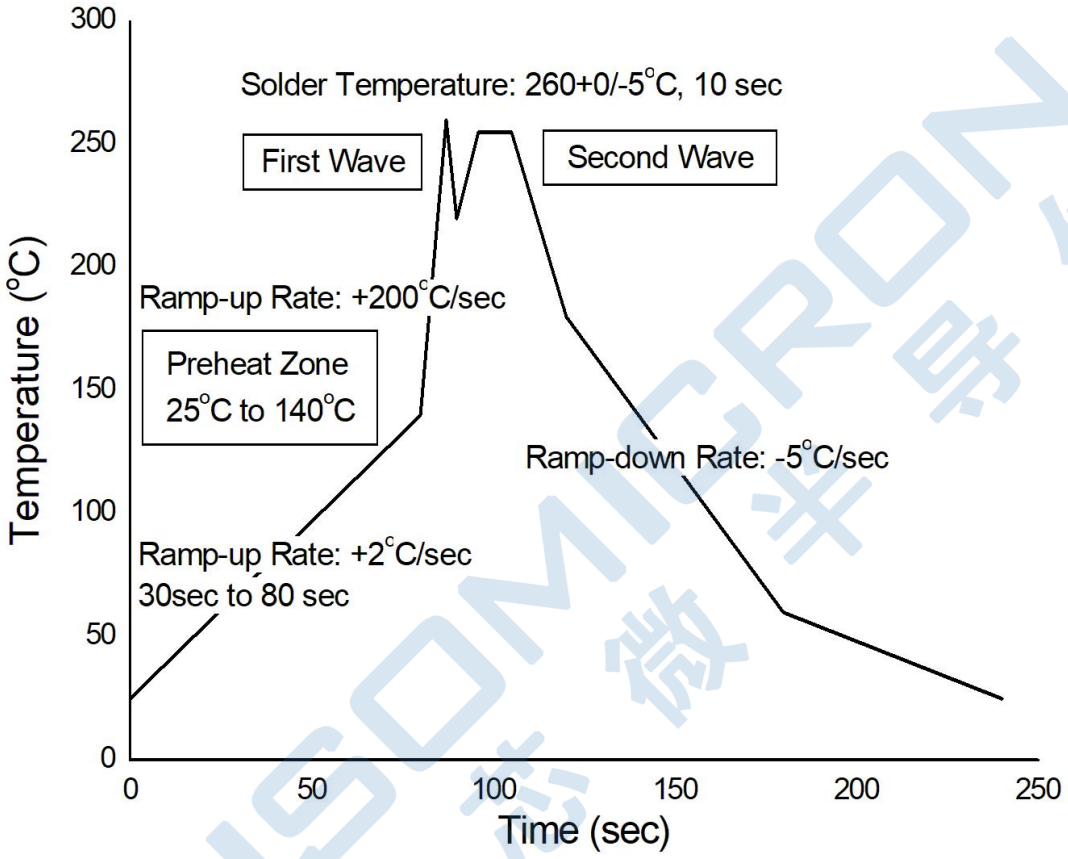
Reflow Profile



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

Wave Soldering (JESD22-A111 Compliant)



Hand Soldering By Soldering Iron	
Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.

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

DISCLAIMER

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- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
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- Please contactISOMICRON sales agent for special application request.
- Immerge unit’s body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modifyISOMICRON’s terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.