



ISPQ1202X & ISPQ1204X

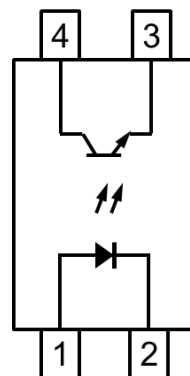


DESCRIPTION

The ISPQ1202X and ISPQ1204X are high-performance single-channel optocouplers in a compact LSOP-4 SMT package, engineered for reliable isolation.

They feature a 5000 V_{rms} isolation rating and 8 mm creepage distance, delivering robust and safe isolation.

The ISPQ12XX series is offered in two CTR options, providing a combined coverage of 100% to 600%.



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

KEY FEATURES

- AEC-Q102 testing or automotive-grade reliability
- Two current transfer ratio (CTR) options
- High isolation performance with 5000V_{rms} input-output isolation voltage (V_{iso})
- Rated for a maximum collector-emitter voltage of 80V (V_{CEO})
- Compact and efficient LSOP-4 package with superior 8mm creepage distance
- UL 1577
- VDE Approval Certificate No. 40062505
- Fully compliant with RoHS regulations (EU RoHS directive No. 2002/95/EC, 2011/65/EU, and 2015/863)
- MSL Class 1, ensuring minimal sensitivity to moisture and ideal for automated assembly

APPLICATIONS

- Ideal for BMS (Battery Management Systems)
- Power Management Circuits (PMCs)
- EV & Hybrid Electric Industry
- PLCs & Other control systems

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	6V
Power dissipation	70mW
Junction Temperature	125°C

Output

Collector to Emitter V _{CEO}	80V
Emitter to Collector V _{ECO}	7V
Collector Current	50mA
Collector Power Dissipation	150mW
Junction Temperature	125°C

Total Package

Isolation Voltage	5000V _{RMS}
Total Power Dissipation	250mW
Operating Temperature	-55 to 125°C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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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	$I_F = 10\text{ mA}$	-	-	1.6	V
Reverse Current	I_R	$V_R = 4\text{ V}$	-	-	10	μA
Terminal Capacitance	C_t	$V = 0, f = 1\text{ KHz}$	-	30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Dark Current	I_{CEO}	$V_{CE} = 48\text{ V}, I_F = 0\text{ mA}$	-	-	100	nA
Collector - Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0.5\text{ mA}, I_F = 0\text{ mA}$	80	-	-	V
Emitter - Collector Breakdown Voltage	BV_{ECO}	$I_E = 0.1\text{ mA}, I_F = 0\text{ mA}$	7	-	-	V

TRANSFER

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector Current	I_C	$I_F = 5\text{ mA}, V_{CE} = 5\text{ V}$	2.5	-	30	mA
Current Transfer Ratio	CTR	$I_F = 5\text{ mA}, V_{CE} = 5\text{ V}$				
		ISPQ1202X ISPQ1204X	100 200	- -	300 600	% %
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 8\text{ mA}, I_C = 2.4\text{ mA}$	-	-	0.4	V
Isolation Resistance	R_{iso}	500V DC, 40–60% RH	10^{12}	-	-	Ω
Floating Capacitance	C_f	$V=0, f=1\text{MHz}$	-	0.6	1	pF
Response Time (Rise)	t_r	$V_{CE} = 2\text{ V}, I_C = 2\text{ mA}, R_L = 100\Omega$	-	4	18	μs
Response Time (Fall)	t_f	$V_{CE} = 2\text{ V}, I_C = 2\text{ mA}, R_L = 100\Omega$	-	3	18	μs



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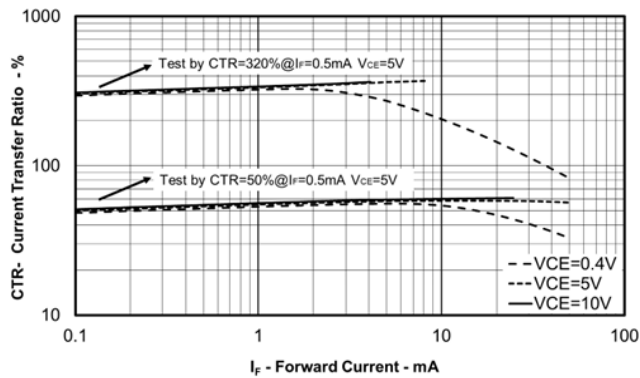


Fig 1 CTR vs Forward Current

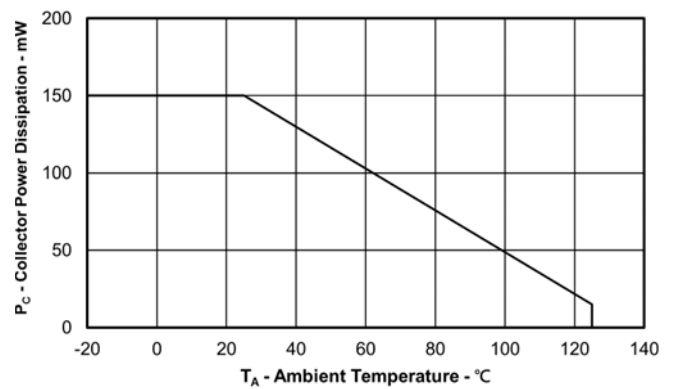


Fig. 2 Collector Dissipation vs Ambient Temp

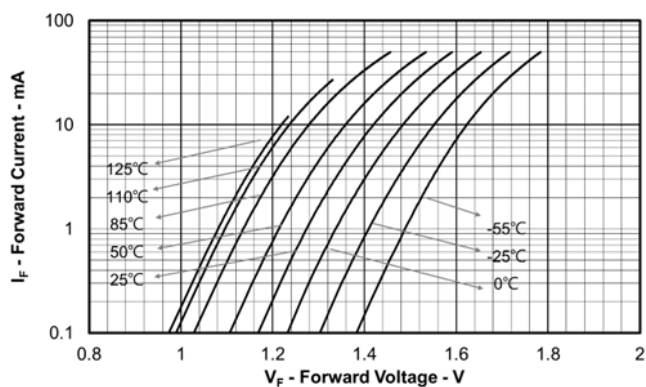


Fig. 3 Forward current vs Forward Voltage

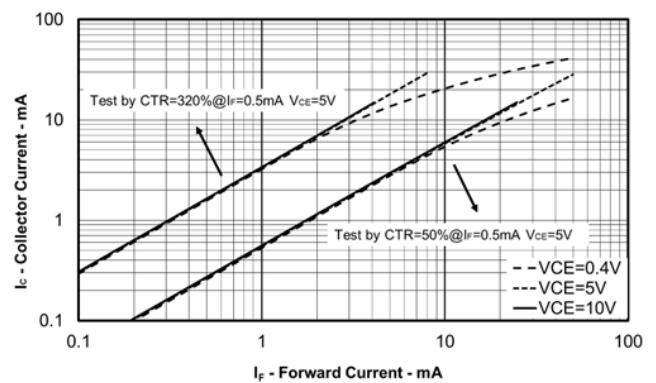


Fig 4 Collector Current vs Forward Current

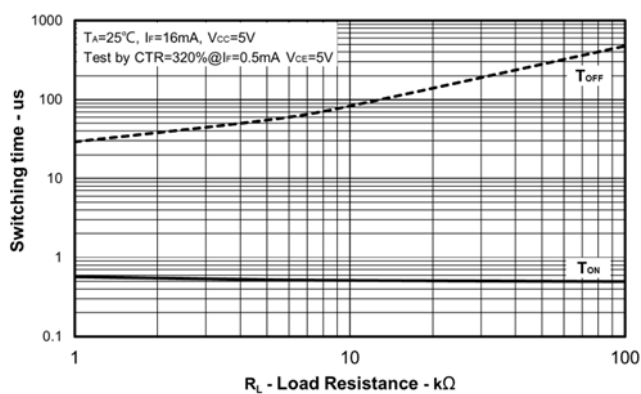


Fig. 5 Response time vs Load

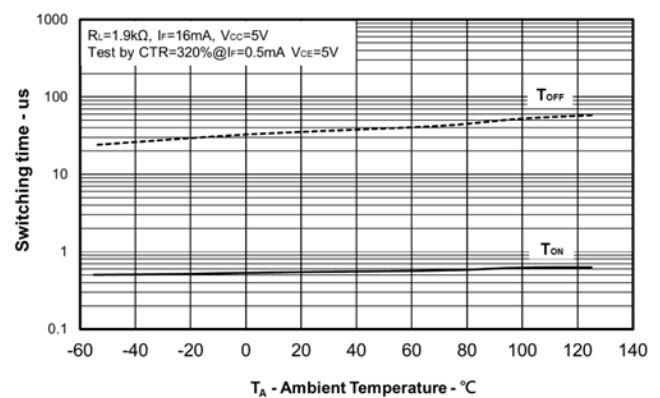


Fig. 6 Response time vs Ambient Temp

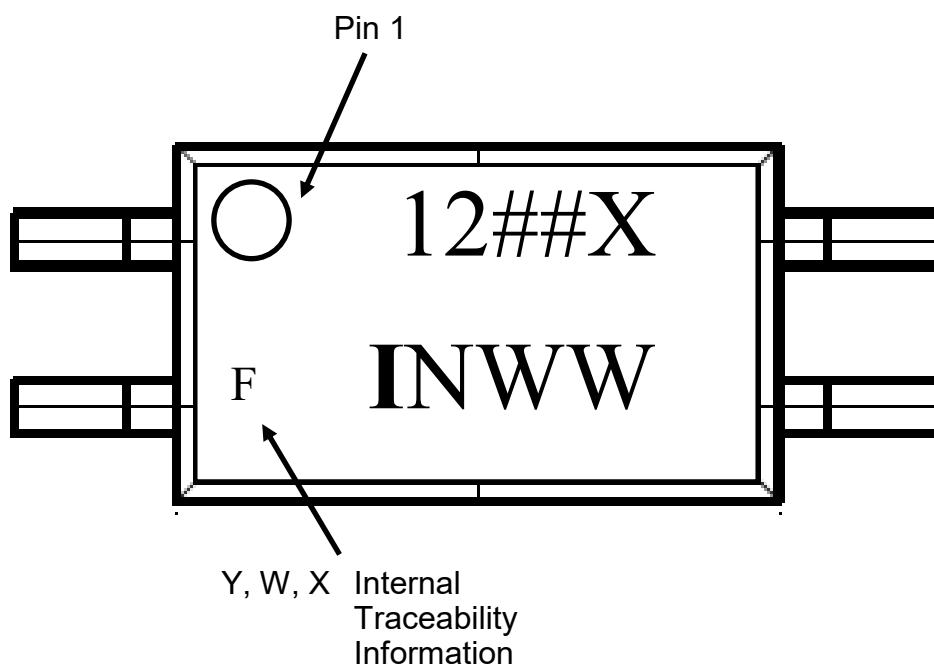
ISPQ1202X & ISPQ1204X**ORDER INFORMATION**

ISPQ1202X & ISPQ1204X			
After PN	PN	Description	Packing quantity
None	ISPQ1202X, ISPQ1204X	SMT LSOP4 T&R VDE & UL	3000



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DEVICE MARKING

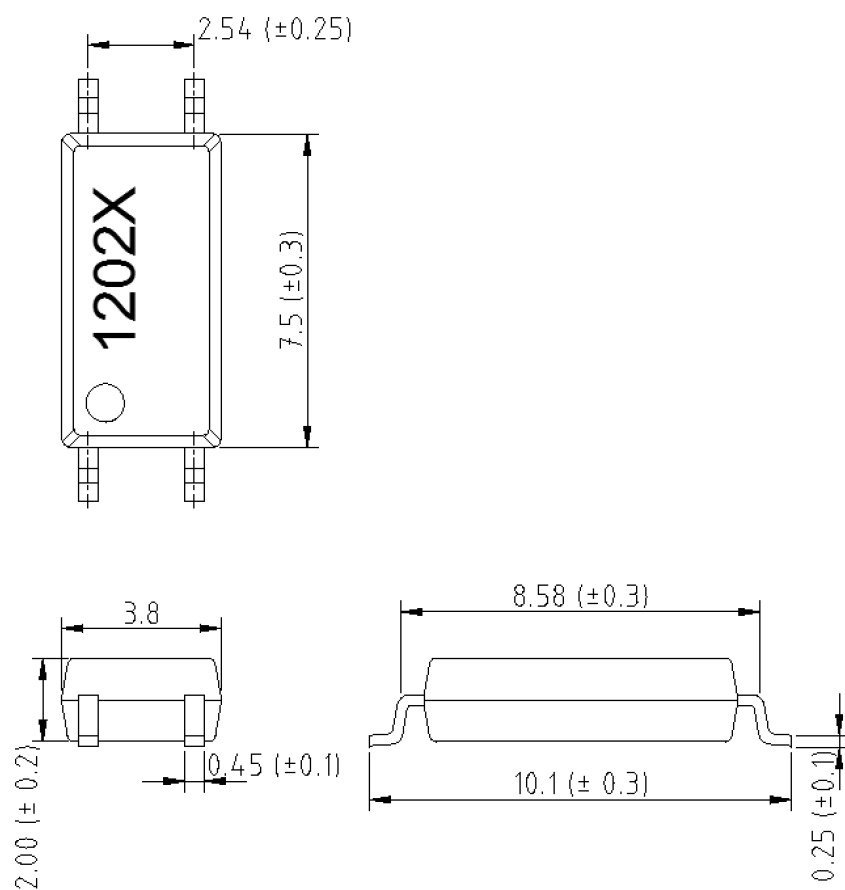


12##X	Device Part Number (1202X or 1204X)
I	Isocom Components 2004 Ltd.
N	Year Code (P=2025, Q=2026, etc...)
WW	2 digit Week code



ISPQ1202X & ISPQ1204X

PACKAGE DIMENSIONS

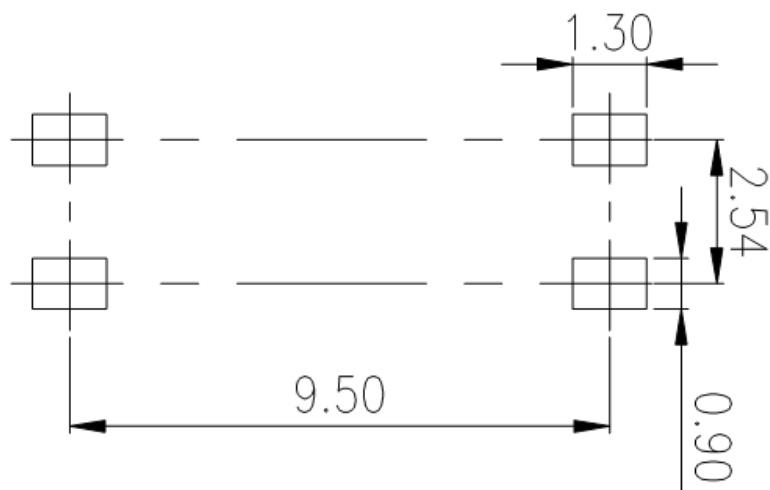


All dimensions in mm

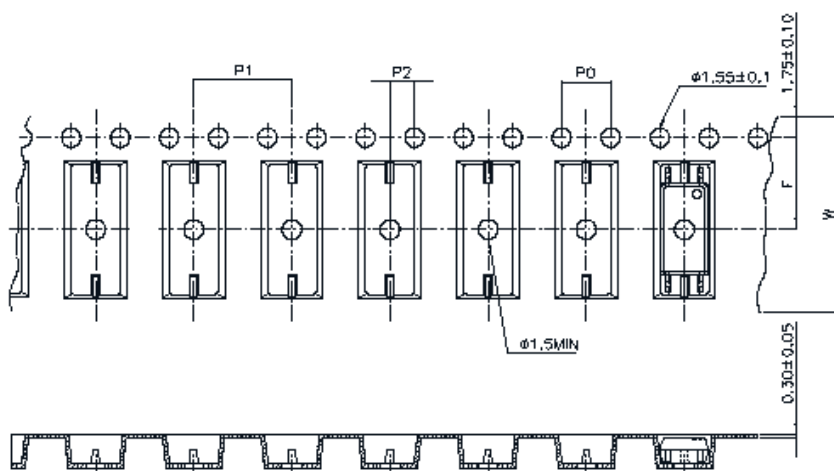


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RECOMMENDED PAD LAYOUT FOR SMD (mm)



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	8 ± 0.1 (0.315)

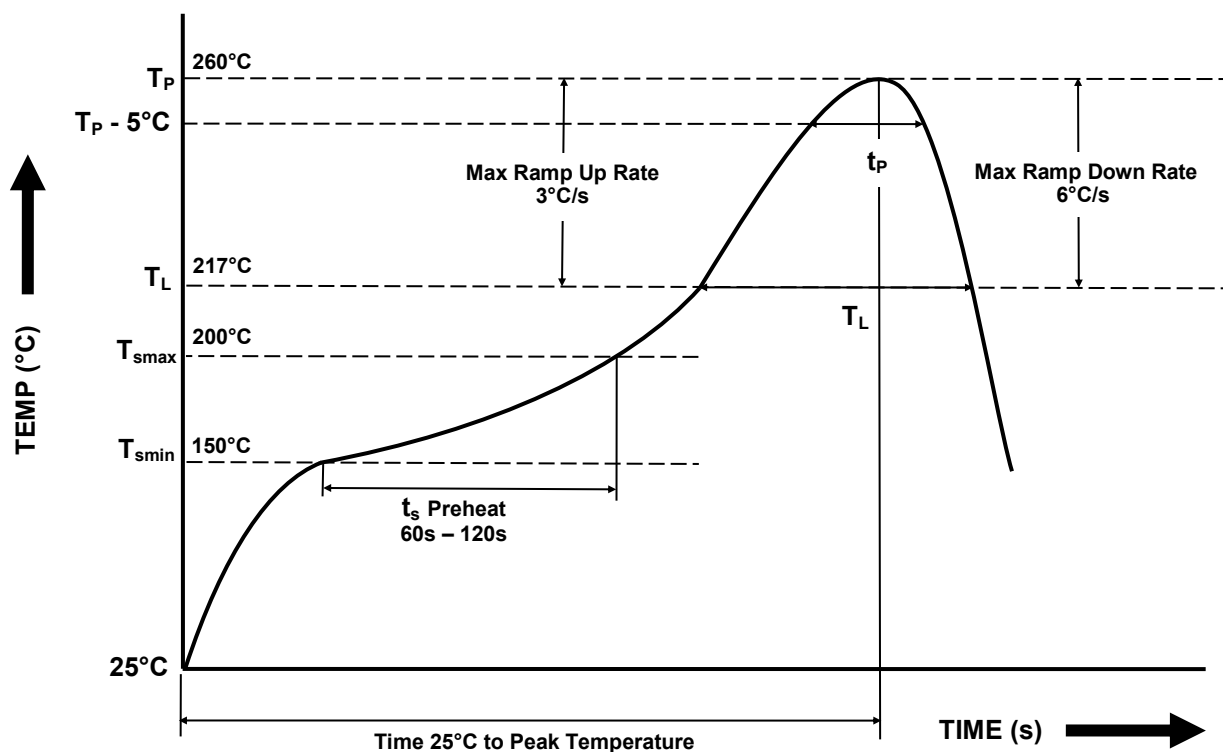


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IR REFLOW SOLDERING TEMPERATURE PROFILE

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 90s - 120s
Soldering Zone - Peak Temperature (T_P) - Time at Peak Temperature - Liquidous Temperature (T_L) - 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 20 Sec max 217°C 60s 3°C/s max 3-6°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

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