

TLP621, TLP621-2, TLP621-4

DESCRIPTION



The TLP621, TLP621-2 and TLP621-4 series of optically coupled isolator consist of an infrared light emitting diode and an NPN silicon photo transistor in a space efficient Dual In Line Plastic Package.

FEATURES

- AC Isolation Voltage 5300V_{RMS}
- CTR Selections Available
- Wide Operating Temperature Range -55°C to +100°C
- ESD HBM 8000V/MM2000V
- Lead Free and RoHS Compliant
- UL File E91231 Package Code "EE"
- VDE Approval Certificate No. 40028086

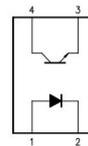
APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

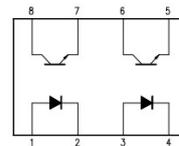
ORDER INFORMATION

- Add X after PN for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel (Available for TLP621SM and TLP621-2SM)
- Optional Order Part No. TLP621-1 for TLP621

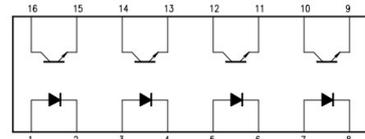
TLP621



TLP621-2



TLP621-4



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

Output

Collector to Emitter Voltage BV _{CEO}	55V
Emitter to Collector Voltage BV _{ECO}	6V
Collector Current	50mA
Power Dissipation	150mW

Total Package

Isolation Voltage	5300V _{RMS}
Total Power Dissipation	200mW
Operating Temperature	-55 to 100 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

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ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
Reverse Voltage	V_R	$I_R = 10\mu\text{A}$	5.0			V
Reverse Leakage	I_R	$V_R = 5\text{V}$			10	μA
Terminal Capacitance	C_t	$V = 0\text{V}, f = 1\text{KHz}$		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector—Emitter breakdown Voltage	BV_{CEO}	$I_C = 0.5\text{mA}, I_F = 0\text{mA}$	55			V
Emitter—Collector breakdown Voltage	BV_{ECO}	$I_E = 100\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector-Emitter Dark Current	I_{CEO}	$V_{CE} = 24\text{V}, I_F = 0\text{mA}$			100	nA

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ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	50		600	%
		Optional CTR Grades				
		GR	100		300	
		BL	200		600	
		GB	100		600	
		GB ($I_F = 1\text{mA}, V_{CE} = 0.4\text{V}$)	30			
Collector—Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 8\text{mA}, I_C = 2.4\text{mA}$ GB ($I_F = 1\text{mA}, I_C = 0.2\text{mA}$)			0.4 0.4	V
Output Rise Time	t_r	$V_{CE} = 10\text{V},$ $I_C = 2\text{mA},$ $R_L = 100\Omega$		2		μs
Output Fall Time	t_f			3		
Turn-on Time	t_{on}			3		
Turn-off Time	t_{off}			3		

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	AC 1 minute, RH = 40 to 60% Note 1	5300			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{V}$ Note 1	5×10^{10}			Ω

Note 1 : Measure with input leads shorted together and output leads shorted together.

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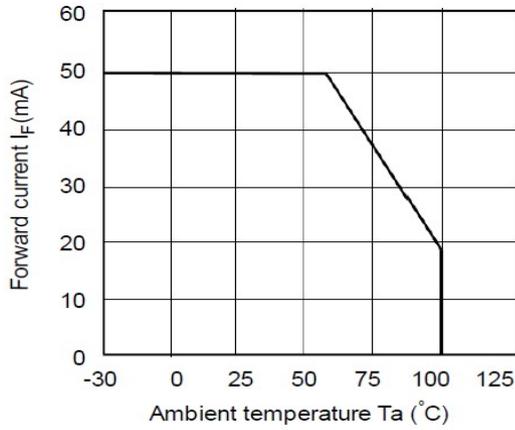


Fig 1 Forward Current vs T_A

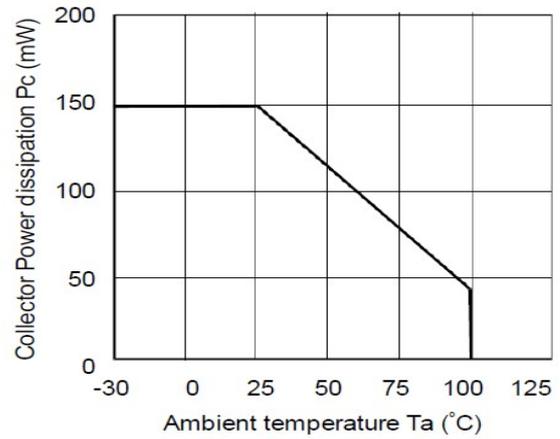


Fig 2 Collector Power Dissipation vs T_A

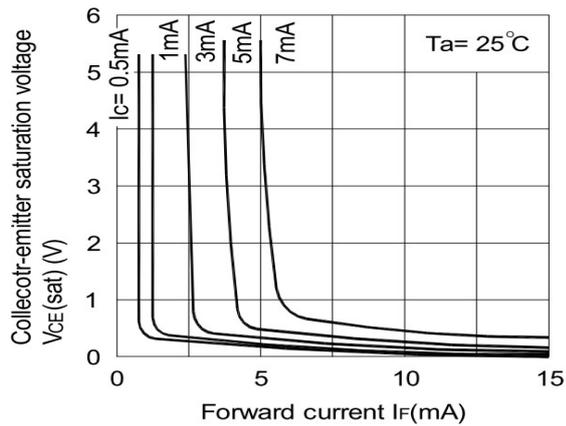


Fig 3 Collector-emitter Saturation Voltage vs Forward Current

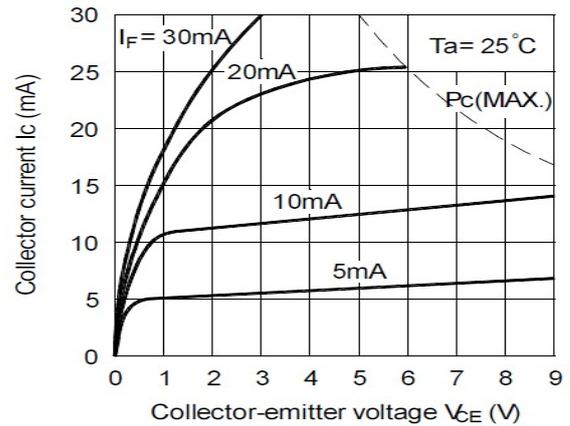


Fig 4 Collector Current vs Collector-emitter Voltage

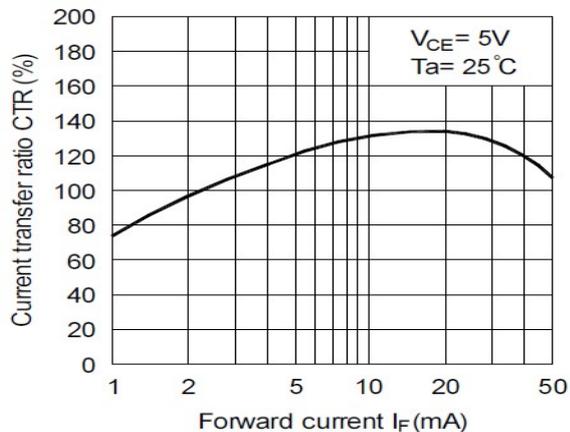


Fig 5 Current Transfer Ratio vs Forward Current

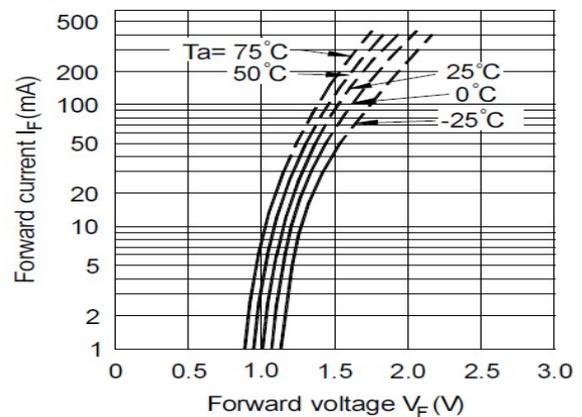


Fig 6 Forward Current vs Forward Voltage



TLP621, TLP621-2, TLP621-4

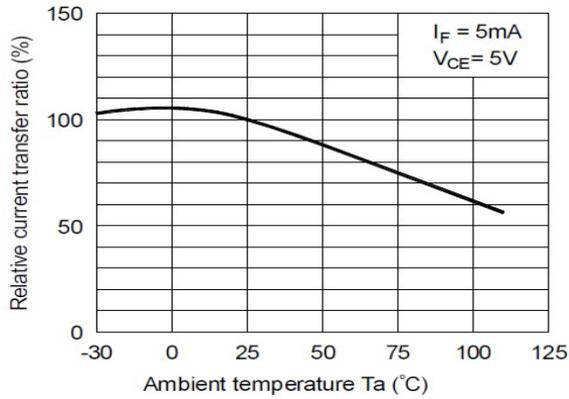


Fig 7 Relative CTR vs T_A

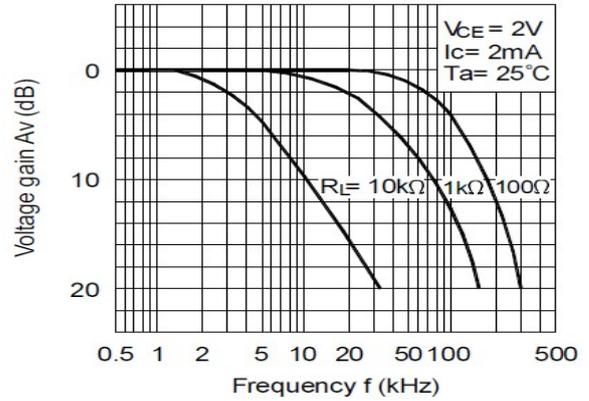


Fig 8 Frequency Response

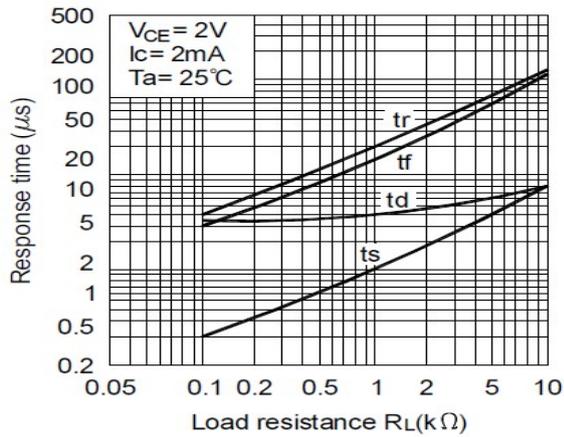
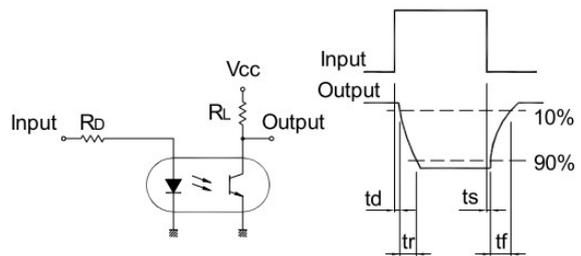


Fig 9 Response Time vs Load Resistance



Response Time Test Circuit

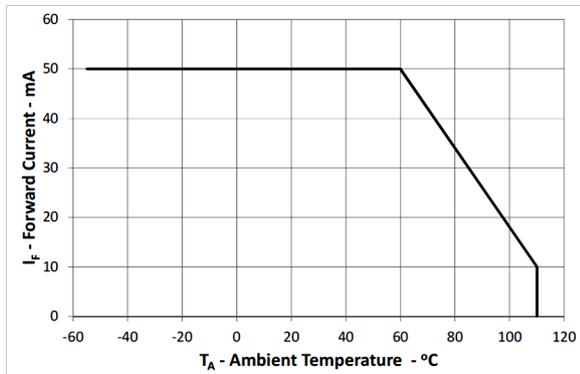


Fig 10 Forward Current vs Ambient Temp

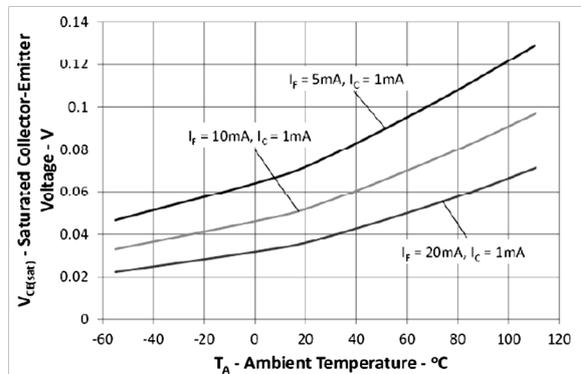


Fig 11 Saturation Voltage vs Ambient Temp

TLP621, TLP621-2, TLP621-4

ORDER INFORMATION

TLP621, TLP621-1 (UL Approval)			
After PN	PN	Description	Packing quantity
None	TLP621, TLP621-1 TLP621GR, TLP621-1GR TLP621BL, TLP621-1BL TLP621GB, TLP621-1GB	Standard DIP4	100 pcs per tube
G	TLP621G, TLP621-1G TLP621GRG, TLP621-1GRG TLP621BLG, TLP621-1BLG TLP621GBG, TLP621-1GBG	10mm Lead Spacing	100 pcs per tube
SM	TLP621SM, TLP621-1SM TLP621GRSM, TLP621-1GRSM TLP621BLSM, TLP621-1BLSM TLP621GBSM, TLP621-1GBSM	Surface Mount	100 pcs per tube
SMT&R	TLP621SMT&R TLP621-1SMT&R TLP621GRSMT&R TLP621-1GRSMT&R TLP621BLSMT&R TLP621-1BLSMT&R TLP621GBSMT&R TLP621-1GBSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

Note : Optional Order Part No. TLP621-1 for TLP621.

Devices with suffix "X" (UL and VDE approvals) may be supplied when ordering the above Part Numbers (UL approval only).

TLP621, TLP621-2, TLP621-4

ORDER INFORMATION

TLP621-2 (UL Approval)			
After PN	PN	Description	Packing quantity
None	TLP621-2, TLP621-2GR, TLP621-2BL, TLP621-2GB	Standard DIP8	50 pcs per tube
G	TLP621-2G, TLP621-2GRG, TLP621-2BLG, TLP621-2GBG	10mm Lead Spacing	50 pcs per tube
SM	TLP621-2SM, TLP621-2GRSM, TLP621-2BLSM, TLP621-2GBSM	Surface Mount	50 pcs per tube
SMT&R	TLP621-2SMT&R, TLP621-2GRSMT&R, TLP621-2BLSMT&R, TLP621-2GBSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

TLP621-4 (UL Approval)			
After PN	PN	Description	Packing quantity
None	TLP621-4, TLP621-4GR, TLP621-4BL, TLP621-4GB	Standard DIP16	25 pcs per tube
G	TLP621-4G, TLP621-4GRG, TLP621-4BLG, TLP621-4GBG	10mm Lead Spacing	25 pcs per tube
SM	TLP621-4SM, TLP621-4GRSM, TLP621-4BLSM, TLP621-4GBSM	Surface Mount	25 pcs per tube

TLP621, TLP621-2, TLP621-4

ORDER INFORMATION

TLP621X, TLP621-1X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	TLP621X, TLP621-1X TLP621XGR, TLP621-1XGR TLP621XBL, TLP621-1XBL TLP621XGB, TLP621-1XGB	Standard DIP4	100 pcs per tube
G	TLP621XG, TLP621-1XG TLP621XGRG, TLP621-1XGRG TLP621XBLG, TLP621-1XBLG TLP621XGBG, TLP621-1XGBG	10mm Lead Spacing	100 pcs per tube
SM	TLP621XSM, TLP621-1XSM TLP621XGRSM TLP621-1XGRSM TLP621XBLSM TLP621-1XBLSM TLP621XGBSM TLP621-1XGBSM	Surface Mount	100 pcs per tube
SMT&R	TLP621XSMT&R TLP621-1XSMT&R TLP621XGRSMT&R TLP621-1XGRSMT&R TLP621XBLSMT&R TLP621-1XBLSMT&R TLP621XGBXSMT&R TLP621-1XGBXSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

Note : Optional Order Part No. TLP621-1X for TLP621X.

Devices with suffix "X" (UL and VDE approvals) may be supplied when ordering the above Part Numbers (UL approval only).

TLP621, TLP621-2, TLP621-4

ORDER INFORMATION

TLP621-2X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	TLP621-2X, TLP621-2XGR, TLP621-2XBL, TLP621-2XGB	Standard DIP8	50 pcs per tube
G	TLP621-2XG, TLP621-2XGRG, TLP621-2XB LG, TLP621-2XGBG	10mm Lead Spacing	50 pcs per tube
SM	TLP621-2XSM, TLP621-2XGRSM, TLP621-2XBLSM, TLP621-2XGBSM	Surface Mount	50 pcs per tube
SMT&R	TLP621-2XSMT&R, TLP621-2XGRSMT&R, TLP621-2XBLSMT&R, TLP621-2XGBSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

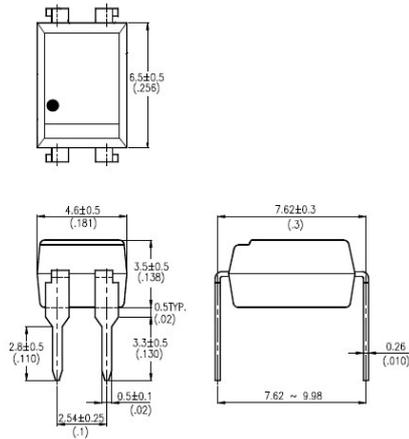
TLP621-4X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	TLP621-4X, TLP621-4XGR, TLP621-4XBL, TLP621-4XGB	Standard DIP16	25 pcs per tube
G	TLP621-4XG, TLP621-4XGRG, TLP621-4XB LG, TLP621-4XGBG	10mm Lead Spacing	25 pcs per tube
SM	TLP621-4XSM, TLP621-4XGRSM, TLP621-4XBLSM, TLP621-4XGBSM	Surface Mount	25 pcs per tube

TLP621, TLP621-2, TLP621-4

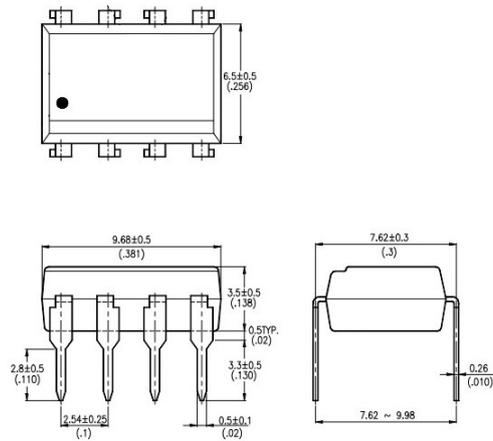
PACKAGE DIMENSIONS in mm (inch)

DIP

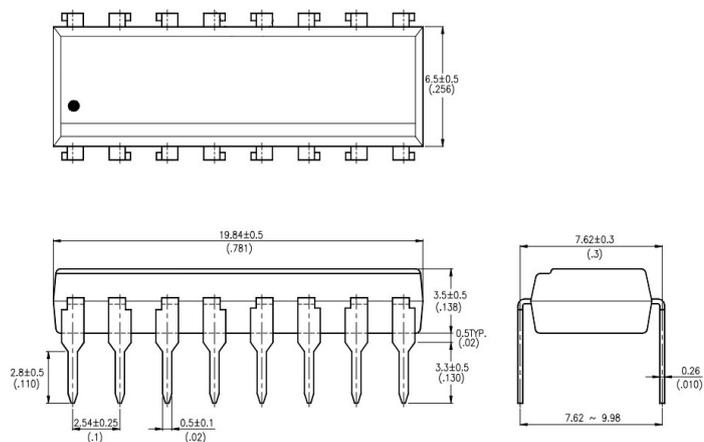
TLP621



TLP621-2



TLP621-4

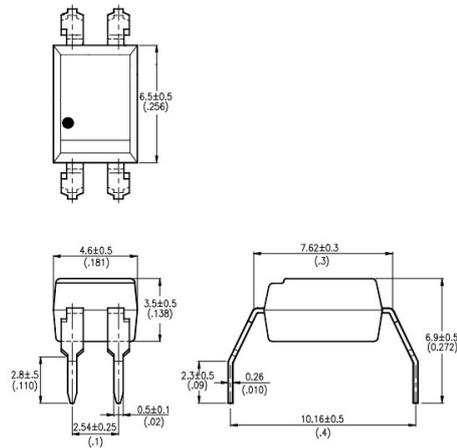


TLP621, TLP621-2, TLP621-4

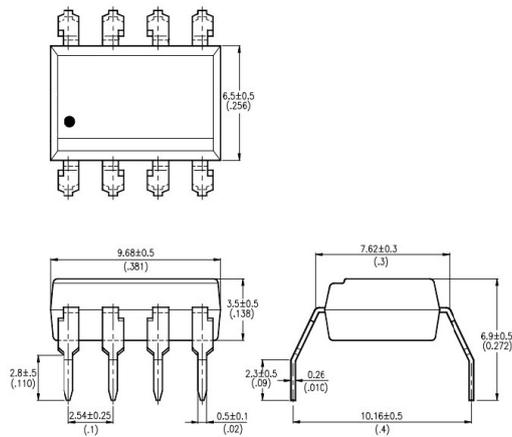
PACKAGE DIMENSIONS in mm (inch)

G Form

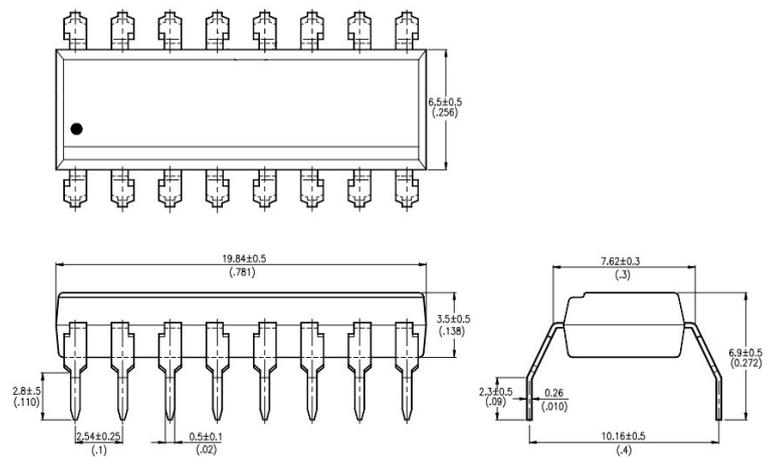
TLP621G



TLP621-2G



TLP621-4G

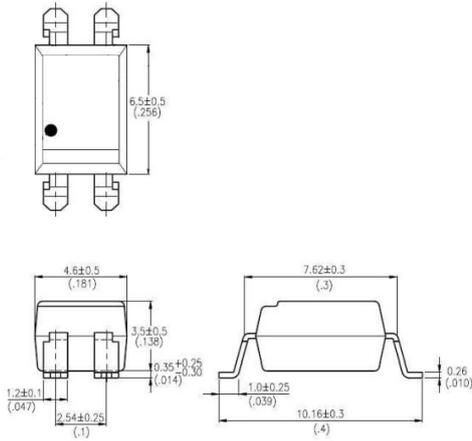


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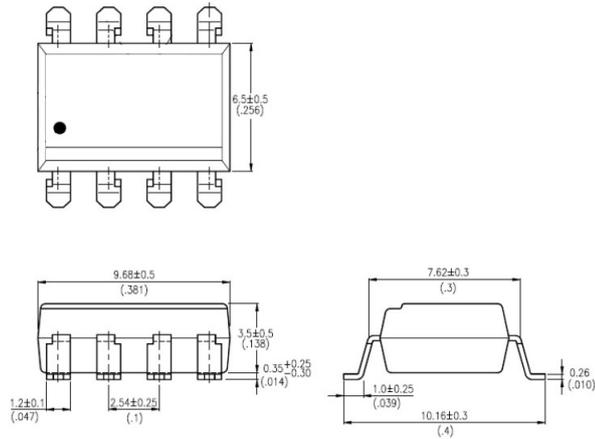
PACKAGE DIMENSIONS in mm (inch)

SMD

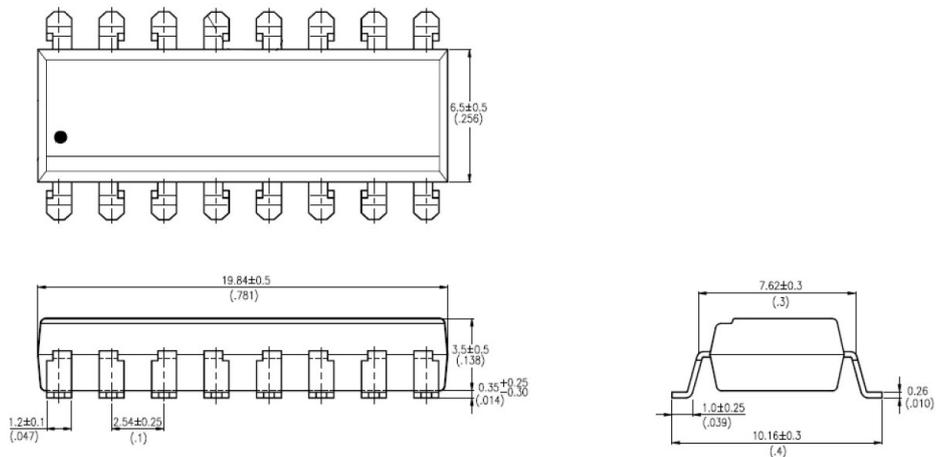
TLP621SM



TLP621-2SM



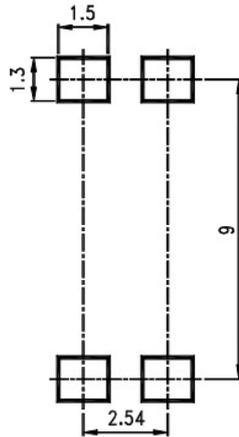
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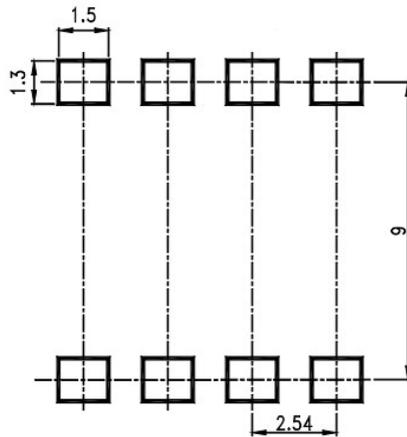
TLP621, TLP621-2, TLP621-4

RECOMMENDED PAD LAYOUT FOR SMD (mm)

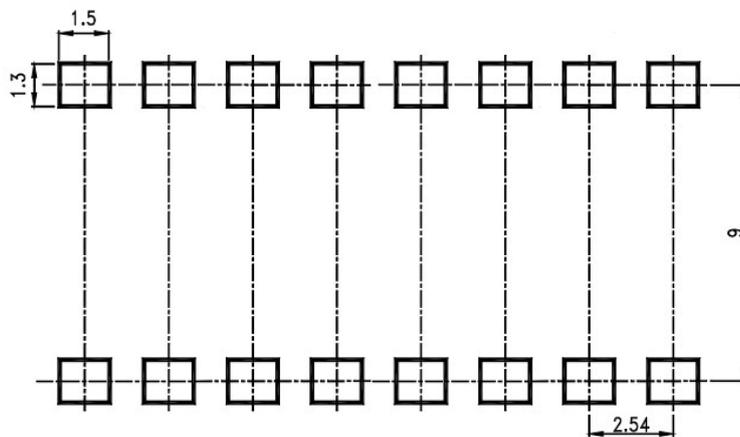
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TLP621-2SM



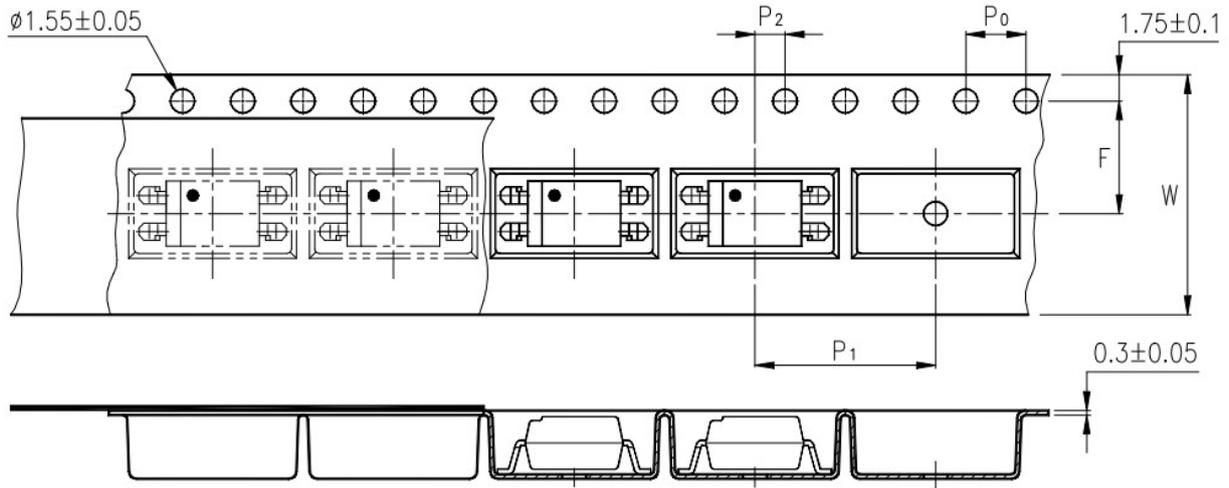
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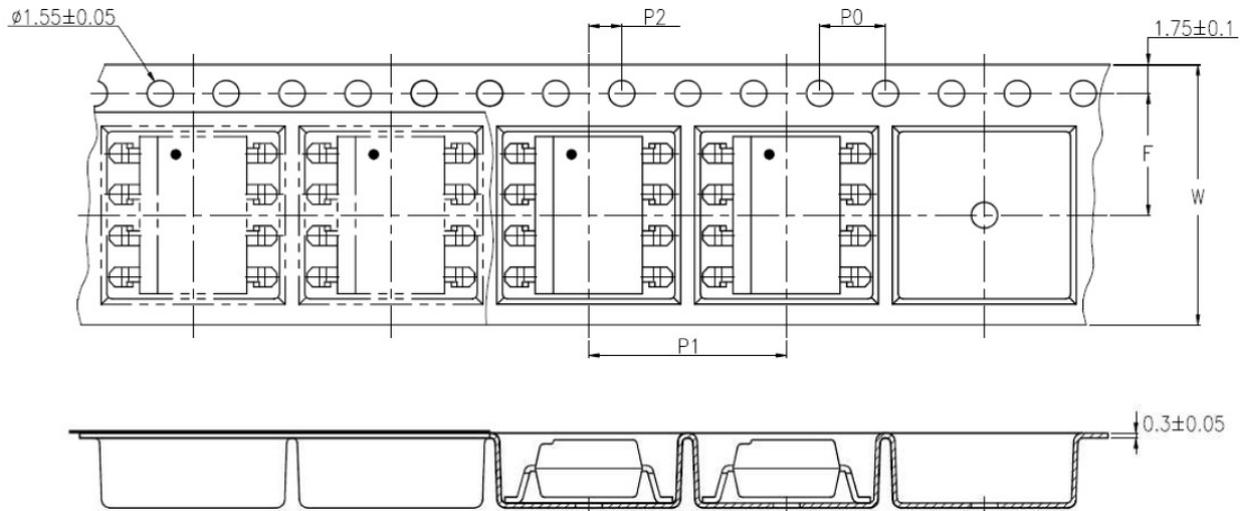
TLP621, TLP621-2, TLP621-4

TAPE AND REEL PACKAGING

TLP621SMT&R



TLP621-2SMT&R

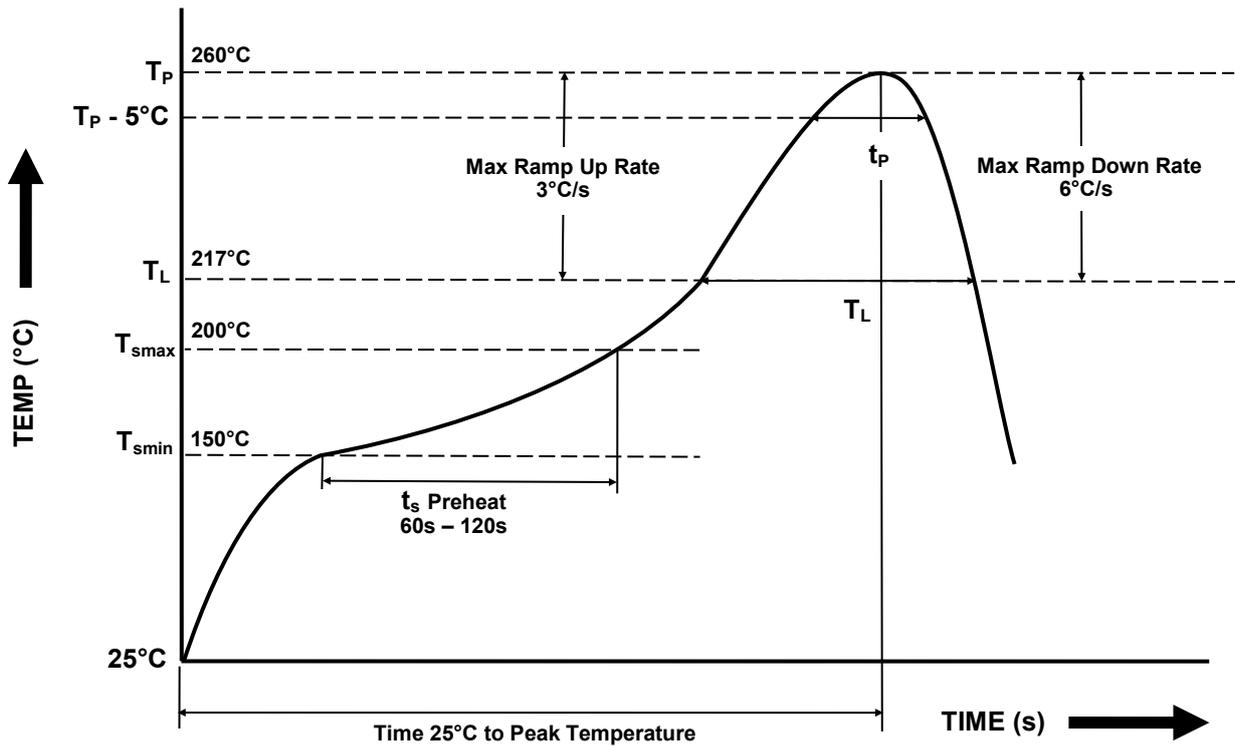


Description	Symbol	Dimensions in mm (inches)
Tape wide	W	16 ± 0.3 (.63)
Pitch of sprocket holes	P_0	4 ± 0.1 (.15)
Distance of compartment	F	7.5 ± 0.1 (.295)
Distance of compartment to compartment	P_1	2 ± 0.1 (.079)
Distance of compartment to compartment	P_1	12 ± 0.1 (.472)



TLP621, TLP621-2, TLP621-4

IR REFLOW SOLDERING TEMPERATURE PROFILE FOR SMD
(One Time Reflow Soldering is Recommended)



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 ($T_P - 5^\circ C$) - 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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