

TLP521, TLP521-2, TLP521-4

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	$I_R = 10\mu\text{A}$	6.0			V
Reverse Leakage	I_R	$V_R = 4\text{V}$			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}	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

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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	$V_{CE} = 2\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$		4		μs
Output Fall Time	t_f			3		
Turn-on Time	t_{on}			3		
Turn-off Time	t_{off}			3		
Turn-on Time	t_{ON}	$V_{CC} = 5\text{V}$, $I_F = 16\text{mA}$, $R_L = 1.9\text{k}\Omega$		2		μs
Turn-off Time	t_{OFF}			25		

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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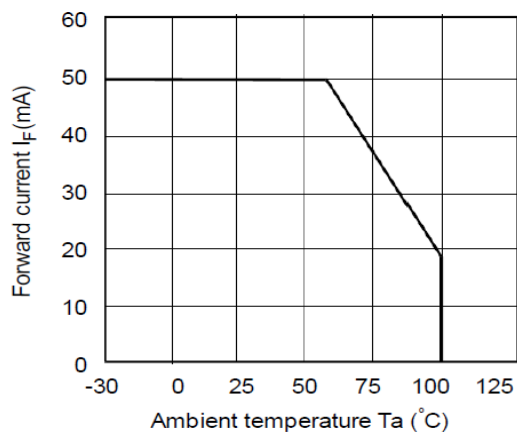


Fig 1 Forward Current vs T_A

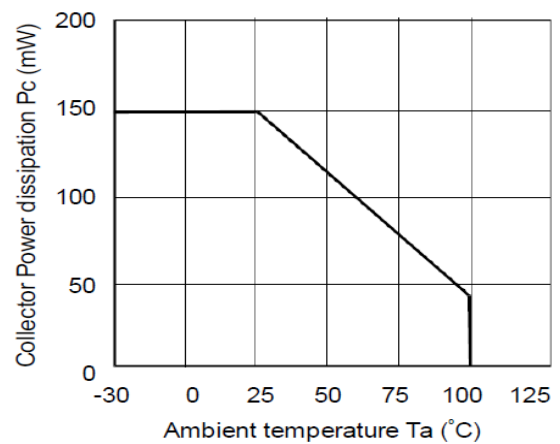


Fig 2 Collector Power Dissipation vs T_A

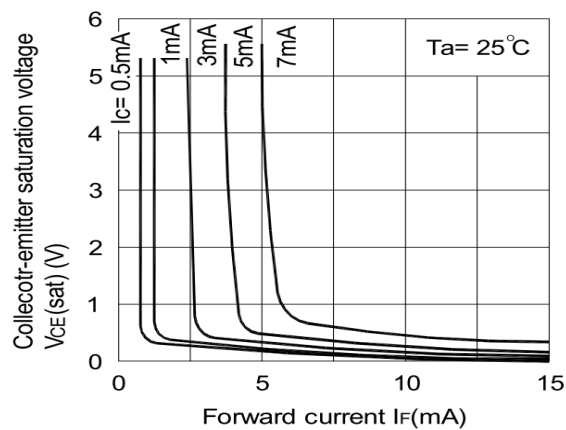


Fig 3 Collector-emitter Saturation Voltage vs Forward Current

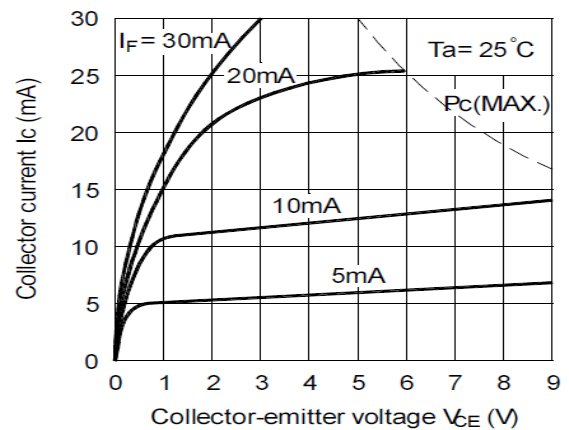


Fig 4 Collector Current vs Collector-emitter Voltage

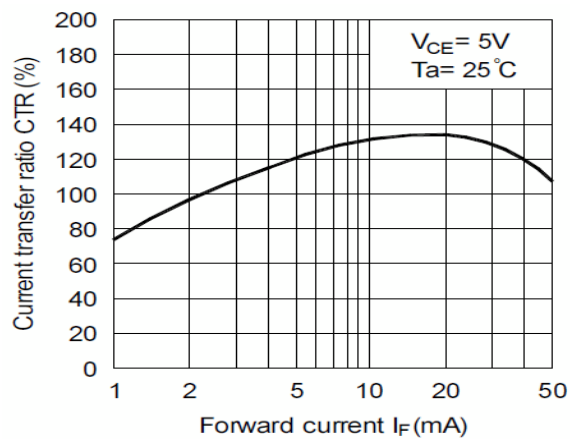


Fig 5 Current Transfer Ratio vs Forward Current

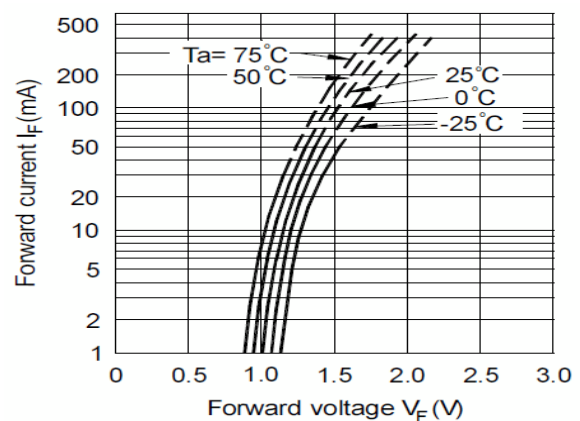


Fig 6 Forward Current vs Forward Voltage



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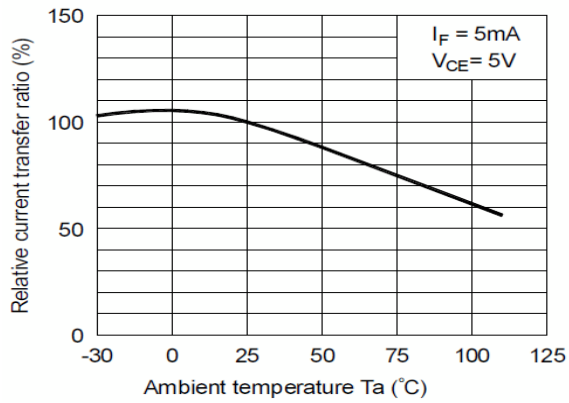


Fig 7 Relative CTR vs T_A

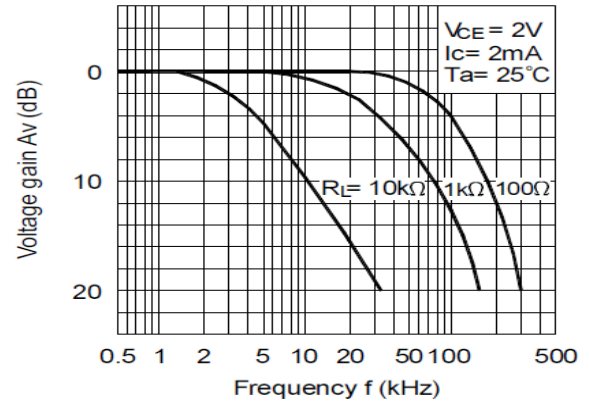


Fig 8 Frequency Response

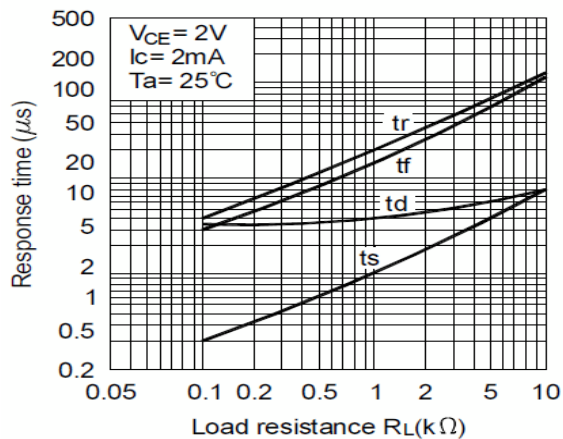
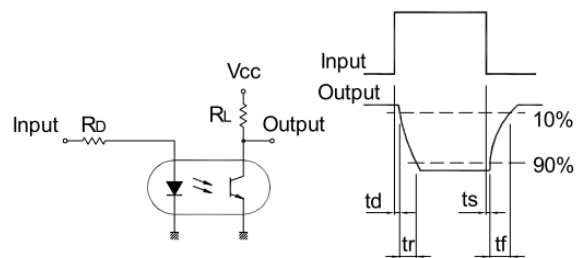


Fig 9 Response Time vs Load Resistance



Response Time Test Circuit

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ORDER INFORMATION

TLP521 (UL Approval)			
After PN	PN	Description	Packing quantity
None	TLP521, TLP521GR, TLP521BL, TLP521GB	Standard DIP4	100 pcs per tube
G	TLP521G, TLP521GRG, TLP521BLG, TLP521GBG	10mm Lead Spacing	100 pcs per tube
SM	TLP521SM, TLP521GRSM, TLP521BLSM, TLP521GBSM	Surface Mount	100 pcs per tube
SMT&R	TLP521SMT&R, TLP521GRSMT&R, TLP521BLSMT&R, TLP521GBSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

TLP521-2 (UL Approval)			
After PN	PN	Description	Packing quantity
None	TLP521-2, TLP521-2GR, TLP521-2BL, TLP521-2GB	Standard DIP8	50 pcs per tube
G	TLP521-2G, TLP521-2GRG, TLP521-2BLG, TLP521-2GBG	10mm Lead Spacing	50 pcs per tube
SM	TLP521-2SM, TLP521-2GRSM, TLP521-2BLSM, TLP521-2GBSM	Surface Mount	50 pcs per tube
SMT&R	TLP521-2SMT&R, TLP521-2GRSMT&R, TLP521-2BLSMT&R, TLP521-2GBSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

TLP521-4 (UL Approval)			
After PN	PN	Description	Packing quantity
None	TLP521-4, TLP521-4GR, TLP521-4BL, TLP521-4GB	Standard DIP16	25 pcs per tube
G	TLP521-4G, TLP521-4GRG, TLP521-4BLG, TLP521-4GBG	10mm Lead Spacing	25 pcs per tube
SM	TLP521-4SM, TLP521-4GRSM, TLP521-4BLSM, TLP521-4GBSM	Surface Mount	25 pcs per tube

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ORDER INFORMATION

TLP521X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	TLP521X, TLP521XGR, TLP521XBL, TLP521XGB	Standard DIP4	100 pcs per tube
G	TLP521XG, TLP521XGRG, TLP521XBLG, TLP521XGBG	10mm Lead Spacing	100 pcs per tube
SM	TLP521XSM, TLP521XGRSM, TLP521XBLSM, TLP521XGBSM	Surface Mount	100 pcs per tube
SMT&R	TLP521XSMT&R, TLP521XGRSMT&R, TLP521XBLSMT&R, TLP521XGBXSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

TLP521-2X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	TLP521-2X, TLP521-2XGR, TLP521-2XBL, TLP521-2XGB	Standard DIP8	50 pcs per tube
G	TLP521-2XG, TLP521-2XGRG, TLP521-2XBLG, TLP521-2XGBG	10mm Lead Spacing	50 pcs per tube
SM	TLP521-2XSM, TLP521-2XGRSM, TLP521-2XBLSM, TLP521-2XGBSM	Surface Mount	50 pcs per tube
SMT&R	TLP521-2XSMT&R, TLP521-2XGRSMT&R, TLP521-2XBLSMT&R, TLP521-2XGBSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

TLP521-4X (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	TLP521-4X, TLP521-4XGR, TLP521-4XBL, TLP521-4XGB	Standard DIP16	25 pcs per tube
G	TLP521-4XG, TLP521-4XGRG, TLP521-4XBLG, TLP521-4XGBG	10mm Lead Spacing	25 pcs per tube
SM	TLP521-4XSM, TLP521-4XGRSM, TLP521-4XBLSM, TLP521-4XGBSM	Surface Mount	25 pcs per tube



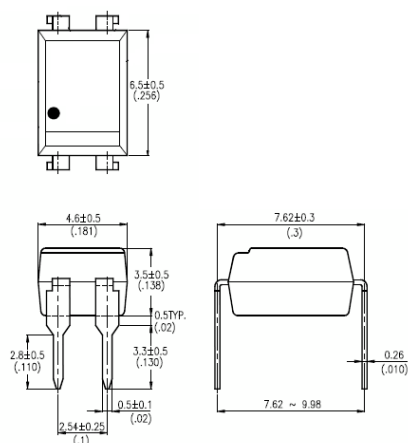
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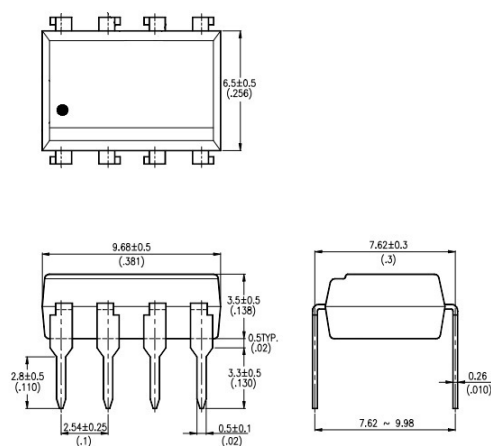
PACKAGE DIMENSIONS in mm (inch)

DIP

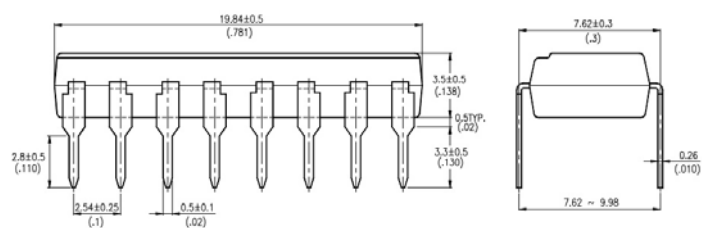
TLP521



TLP521-2



TLP521-4



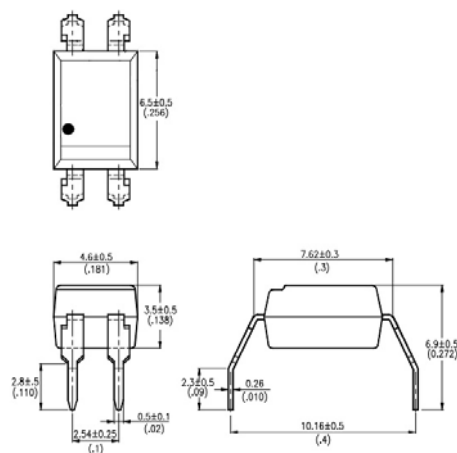


TLP521, TLP521-2, TLP521-4

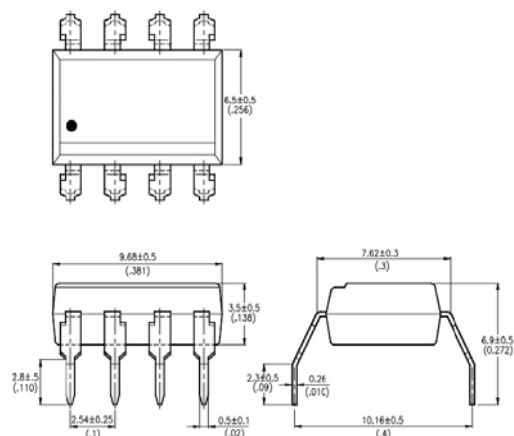
PACKAGE DIMENSIONS in mm (inch)

G Form

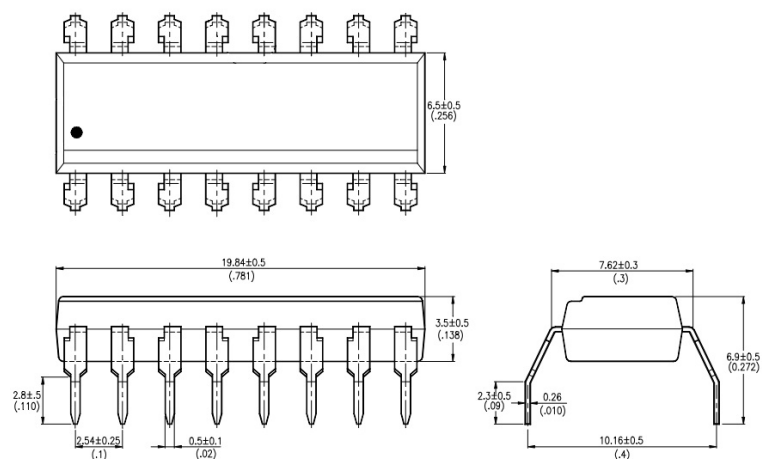
TLP521



TLP521-2



TLP521-4





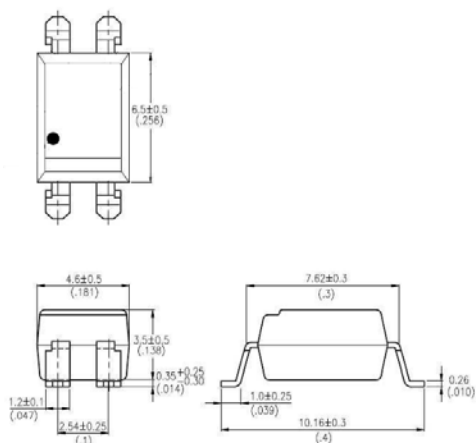
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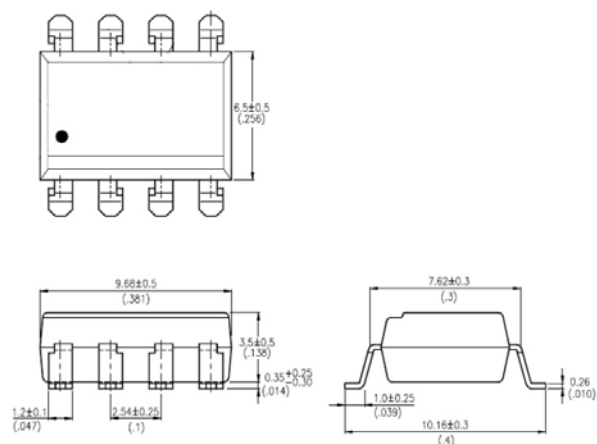
PACKAGE DIMENSIONS in mm (inch)

SMD

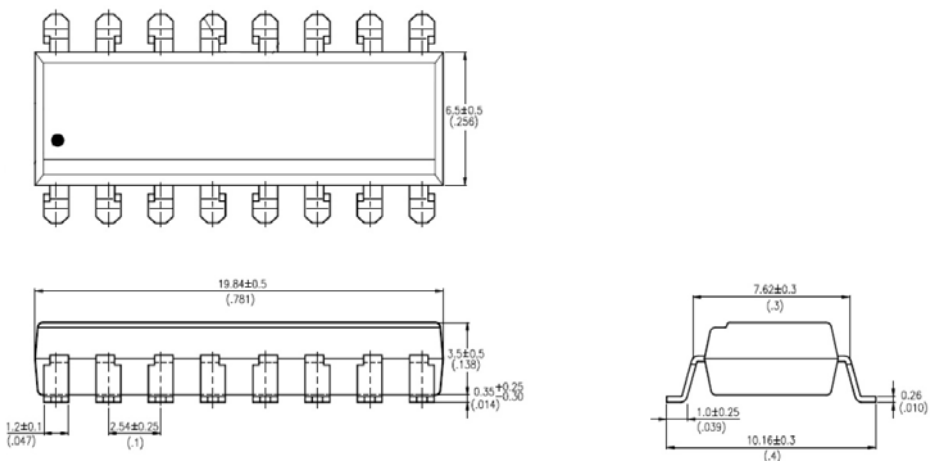
TLP521



TLP521-2



TLP521-4

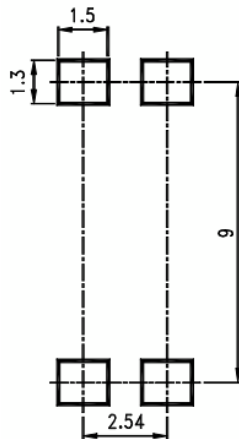




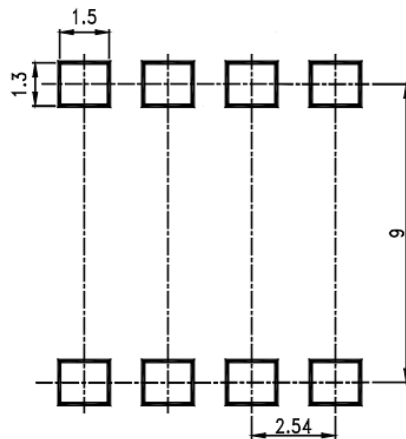
TLP521, TLP521-2, TLP521-4

RECOMMENDED PAD LAYOUT FOR SMD (mm)

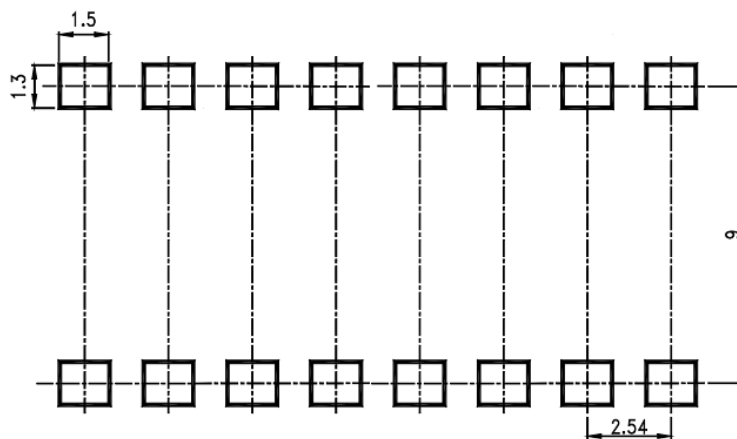
TLP521SM



TLP521-2SM



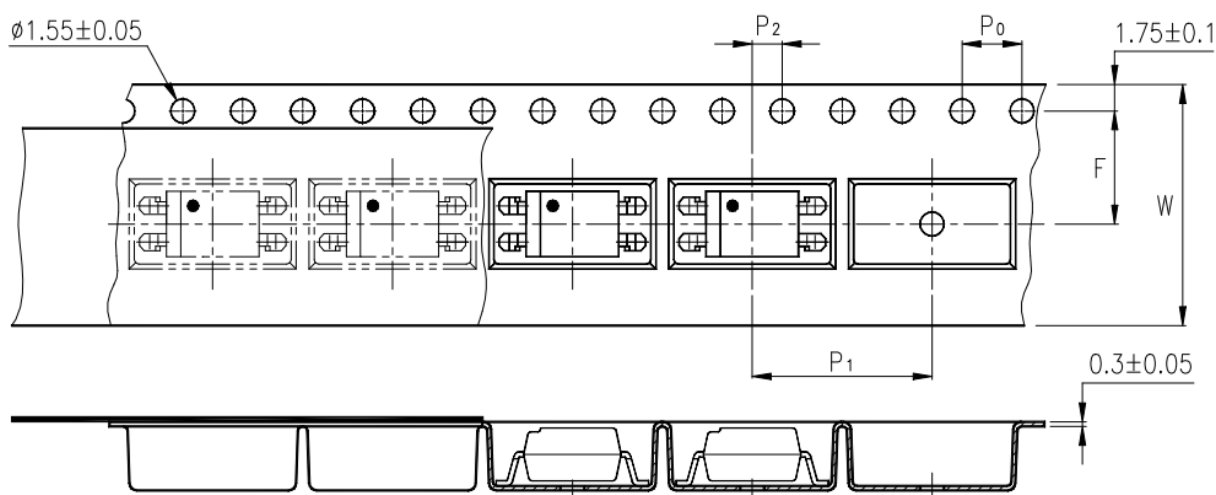
TLP521-4SM



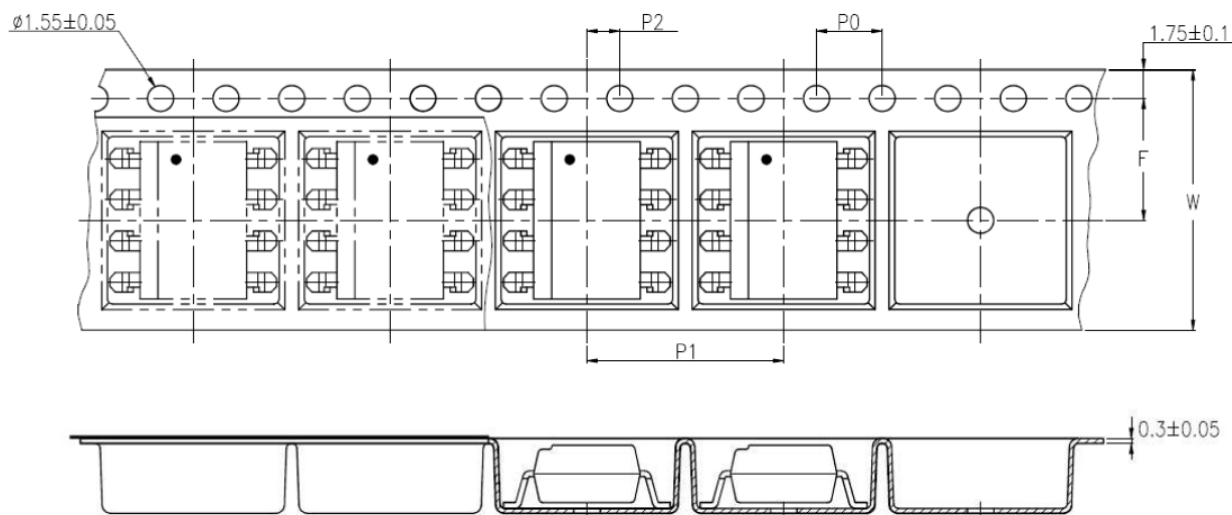


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TAPE AND REEL PACKAGING



TLP521SMT&R



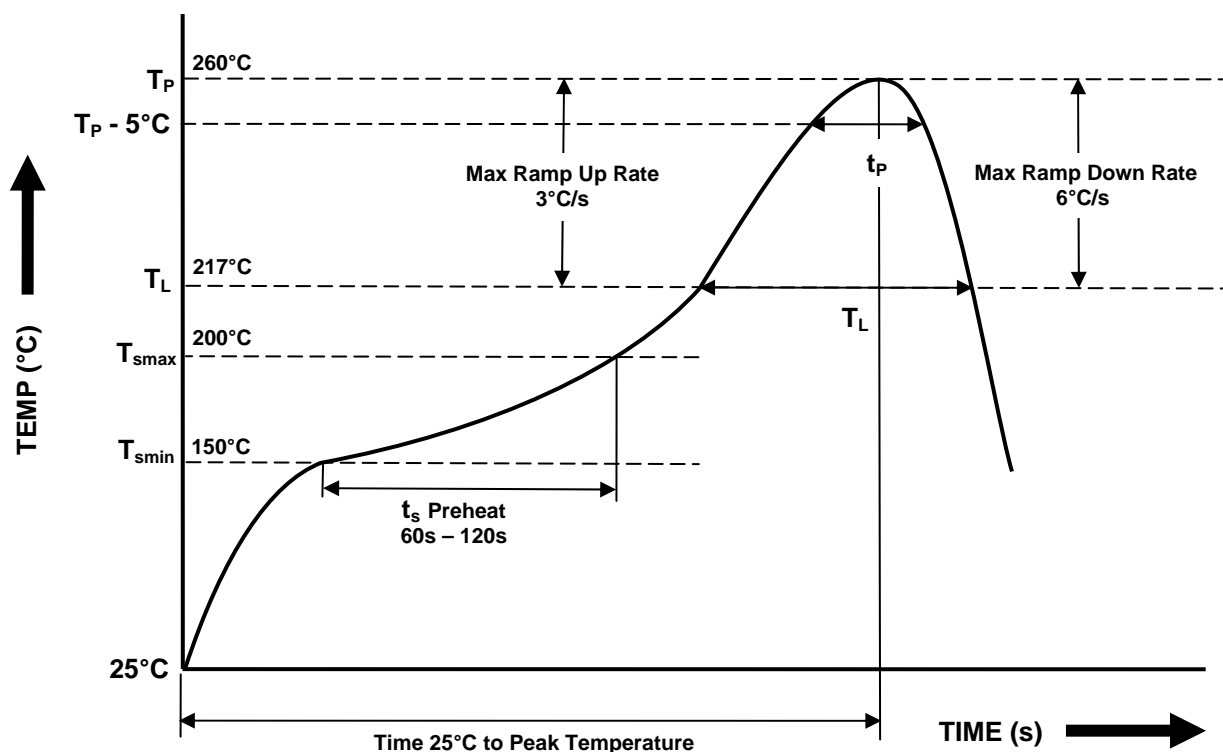
TLP521-2SMT&R

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_2	2 ± 0.1 (.079)
Distance of compartment to compartment	P_1	12 ± 0.1 (.472)



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



Profile Details	Conditions
Preheat <ul style="list-style-type: none">- Min Temperature (T_{SMIN})- Max Temperature (T_{SMAX})- Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s - 120s
Soldering Zone <ul style="list-style-type: none">- Peak Temperature (T_P)- Time at Peak Temperature- Liquidous Temperature (T_L)- Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$)- 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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