



PS2505-1, PS2505-2, PS2505-4



DESCRIPTION

The PS2505-1, PS2505-2 and PS2505-4 series of optocouplers consist of two infrared light emitting diodes connected in reverse parallel optically coupled to an NPN silicon photo transistor in a space efficient Dual In Line Plastic Package.

FEATURES

- AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range
PS2505-1 : -50°C to +110°C
PS2505-2 / PS2505-4 : -30°C to +100°C
- RoHS Compliant
- UL File E91231 Model "EE"
- VDE Approval Certificate No. 40028086

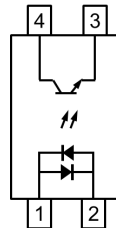
APPLICATIONS

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

ORDER INFORMATION

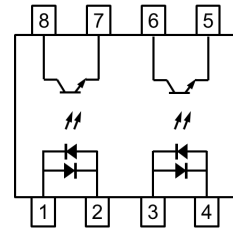
- Add X after PN for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount version
- Add SMT&R after PN for Surface Mount Tape & Reel version available for PS2505-1SM PS2505-2SM
- Consult Factory for Tape and Reel version of PS2505-4SM

PS2505-1



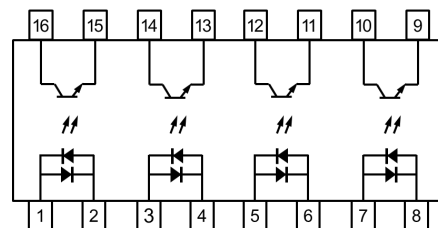
- | | |
|---|---------------|
| 1 | Anode/Cathode |
| 2 | Cathode/Anode |
| 3 | Emitter |
| 4 | Collector |

PS2505-2



- | | |
|------|---------------|
| 1, 3 | Anode/Cathode |
| 2, 4 | Cathode/Anode |
| 5, 7 | Emitter |
| 6, 8 | Collector |

PS2505-4



- | | |
|----------------|---------------|
| 1, 3, 5, 7 | Anode/Cathode |
| 2, 4, 6, 8 | Cathode/Anode |
| 9, 11, 13, 15 | Emitter |
| 10, 12, 14, 16 | Collector |

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PS2505-1, PS2505-2, PS2505-4

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

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	$\pm 50\text{mA}$
Power dissipation	70mW

Output

Collector to Emitter Voltage BV_{CEO}	80V
Emitter to Collector Voltage BV_{ECO}	6V
Collector Current	50mA
Power Dissipation	150mW

Total Package

Isolation Voltage	5000V _{RMS}
Total Power Dissipation	200mW
Operating Temperature	
	PS2505-1 -50 to 110°C
	PS2505-2 / PS2805-4 -30 to 100°C
Storage Temperature	-55 to 125°C
Junction Temperature	125°C
Lead Soldering Temperature (10s)	260°C

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PS2505-1, PS2505-2, PS2505-4

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

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = \pm 20\text{mA}$		1.2	1.4	V
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}	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	80			V
Emitter—Collector breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector-Emitter Dark Current	I_{CEO}	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = \pm 5\text{mA}, V_{CE} = 5\text{V}$	80		600	%
Collector—Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$		0.1	0.2	V
Floating Capacitance	C_f	$V = 0\text{V}, f = 1\text{MHz}$		0.6	1	pF
Output Rise Time	t_r	$V_{CE} = 2\text{V}$ $I_C = 2\text{mA}$ $R_L = 100\Omega$		4	18	μs
Output Fall Time	t_f			3	18	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	R.H. = 40% to 60% $t = 1\text{min}$	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{VDC}$ R.H. = 40% to 60%	5×10^{10}	1×10^{11}		Ω

Device is considered a two terminal device : Input pins are shorted together and Output pins are shorted together.



PS2505-1, PS2505-2, PS2505-4

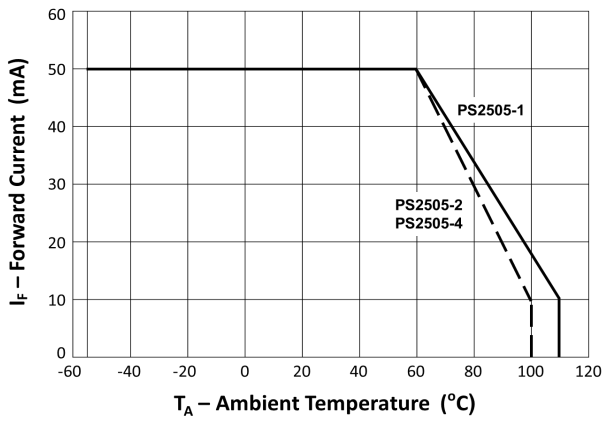


Fig 1 Forward Current vs Ambient Temperature

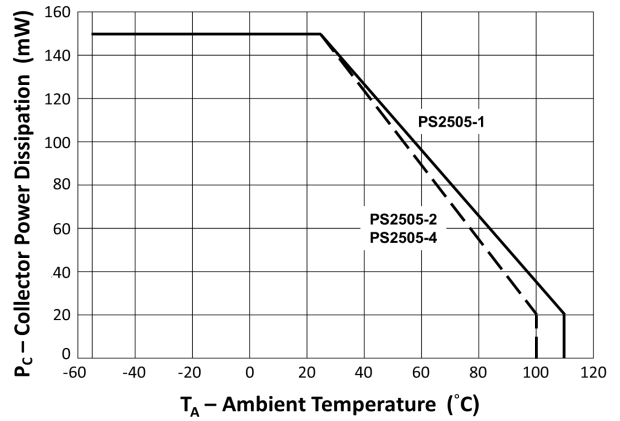


Fig 2 Collector Power Dissipation vs Ambient Temperature

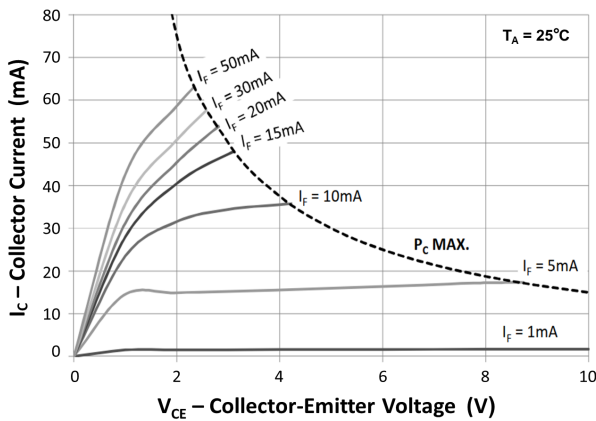


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

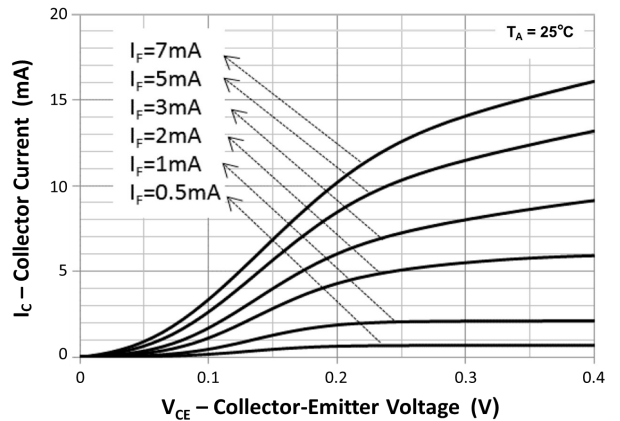


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

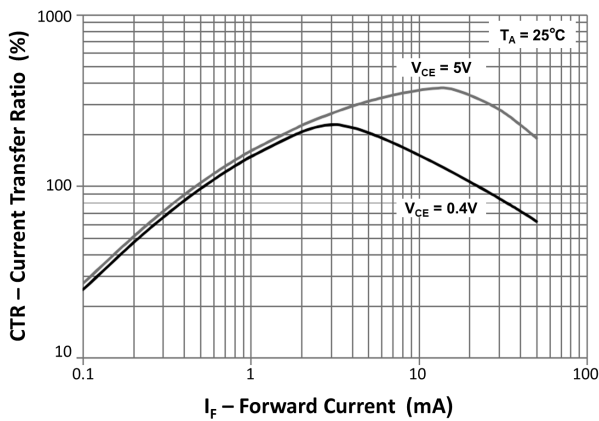


Fig 5 Current Transfer Ratio vs Forward Current

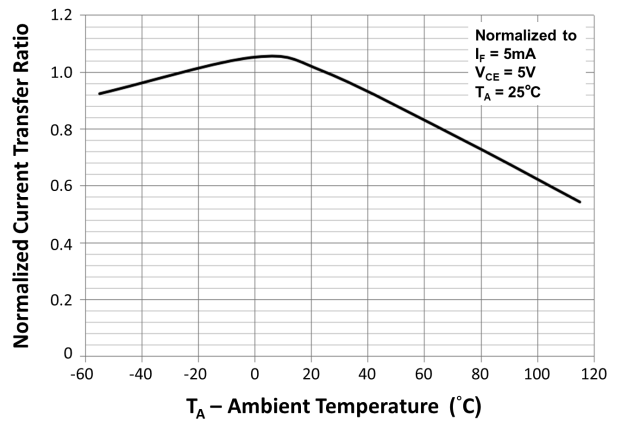


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature

PS2505-1, PS2505-2, PS2505-4

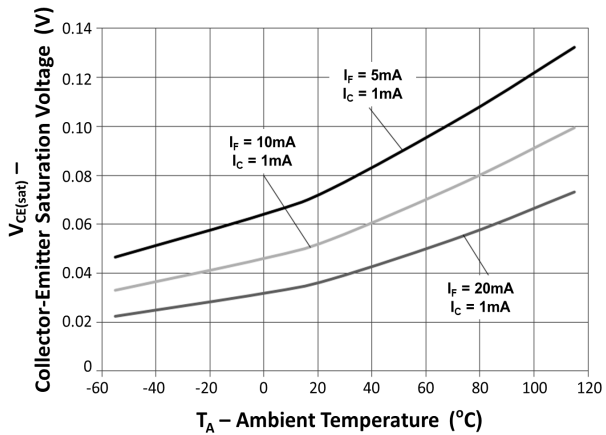


Fig 7 Collector-Emitter Saturation Voltage vs Ambient Temperature

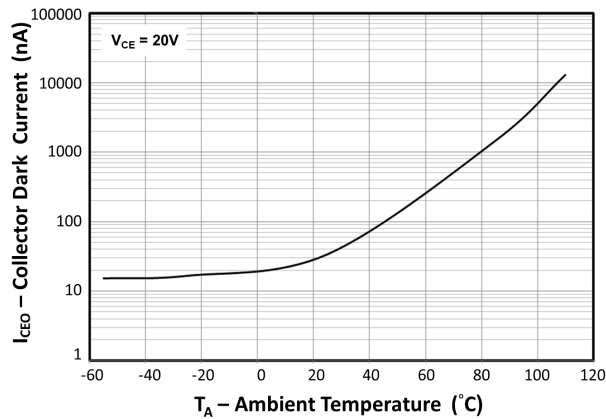


Fig 8 Collector Dark Current vs Ambient Temperature

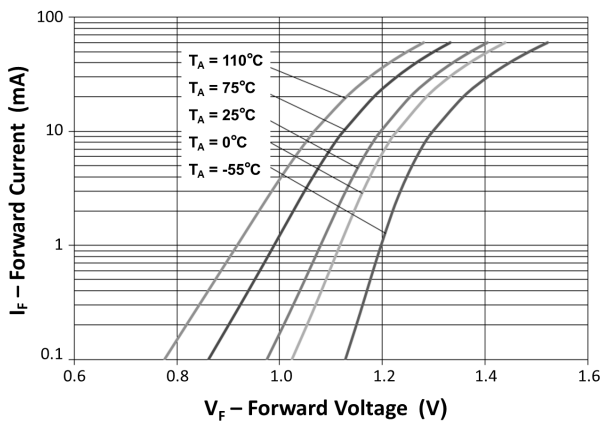


Fig 9 Forward Current vs Forward Voltage

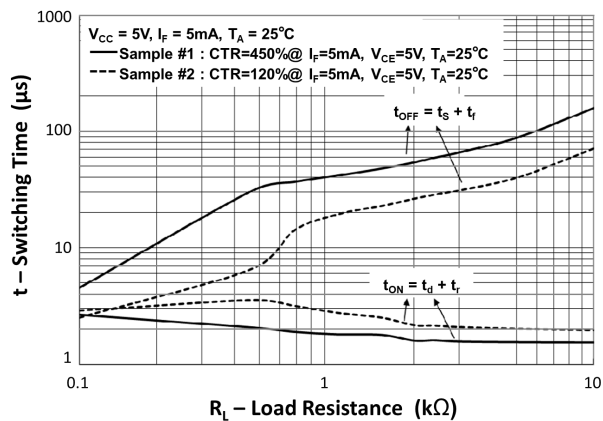


Fig 10 Switching Time vs Load Resistance

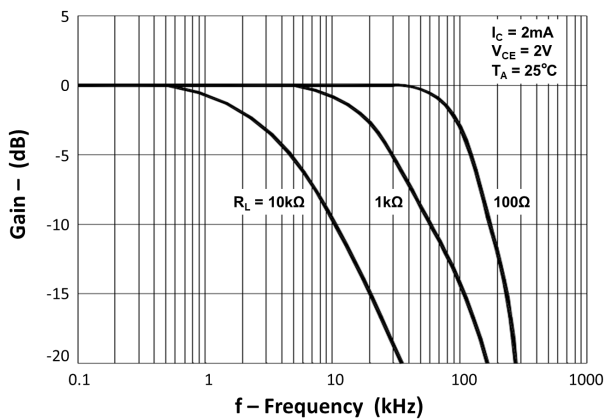
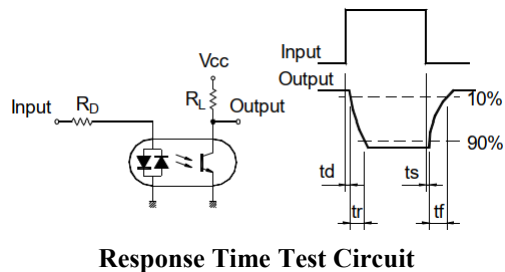
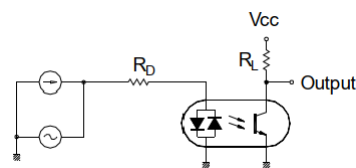


Fig 11 Frequency Response



Response Time Test Circuit



Frequency Response Test Circuit

PS2505-1, PS2505-2, PS2505-4

ORDER INFORMATION

PS2505-1 (UL Approval)			
After PN	PN	Description	Packing quantity
None	PS2505-1	Standard DIP4	100 pcs per tube
G	PS2505-1G	10mm Lead Spacing	100 pcs per tube
SM	PS2505-1SM	Surface Mount	100 pcs per tube
SMT&R	PS2505-1SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

PS2505-2 (UL Approval)			
After PN	PN	Description	Packing quantity
None	PS2505-2	Standard DIP8	50 pcs per tube
G	PS2505-2G	10mm Lead Spacing	50 pcs per tube
SM	PS2505-2SM	Surface Mount	50 pcs per tube
SMT&R	PS2505-2SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

PS2505-4 (UL Approval)			
After PN	PN	Description	Packing quantity
None	PS2505-4	Standard DIP16	25 pcs per tube
G	PS2505-4G	10mm Lead Spacing	25 pcs per tube
SM	PS2505-4SM	Surface Mount	25 pcs per tube

Consult Factory for Tape and Reel version of PS2505-4SM

PS2505-1, PS2505-2, PS2505-4

ORDER INFORMATION

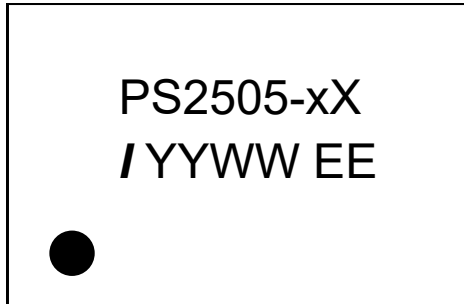
PS2505-1 (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	PS2505-1X	Standard DIP4	100 pcs per tube
G	PS2505-1XG	10mm Lead Spacing	100 pcs per tube
SM	PS2505-1XSM	Surface Mount	100 pcs per tube
SMT&R	PS2505-1XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

PS2505-2 (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	PS2505-2X	Standard DIP8	50 pcs per tube
G	PS2505-2XG	10mm Lead Spacing	50 pcs per tube
SM	PS2505-2XSM	Surface Mount	50 pcs per tube
SMT&R	PS2505-2XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

PS2505-4 (UL and VDE Approvals)			
After PN	PN	Description	Packing quantity
None	PS2505-4X	Standard DIP16	25 pcs per tube
G	PS2505-4XG	10mm Lead Spacing	25 pcs per tube
SM	PS2505-4XSM	Surface Mount	25 pcs per tube

Consult Factory for Tape and Reel version of PS2505-4XSM

DEVICE MARKING



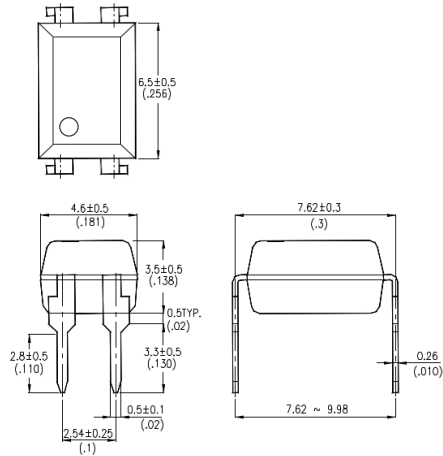
PS2505-x	Device Part Number where “x” denotes number of Channels 1 : Single Channel 2 : Dual Channel 4 : Quad Channel
X	VDE Option
/	Isocom
YY	2 digit Year code (22, 23, etc.)
WW	2 digit Week code
EE	UL Model

PS2505-1, PS2505-2, PS2505-4

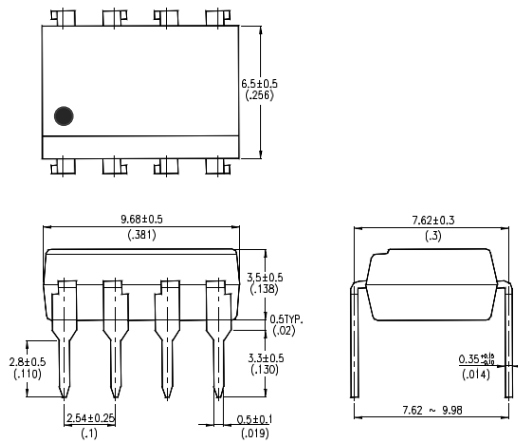
PACKAGE DIMENSIONS in mm (inch)

DIP

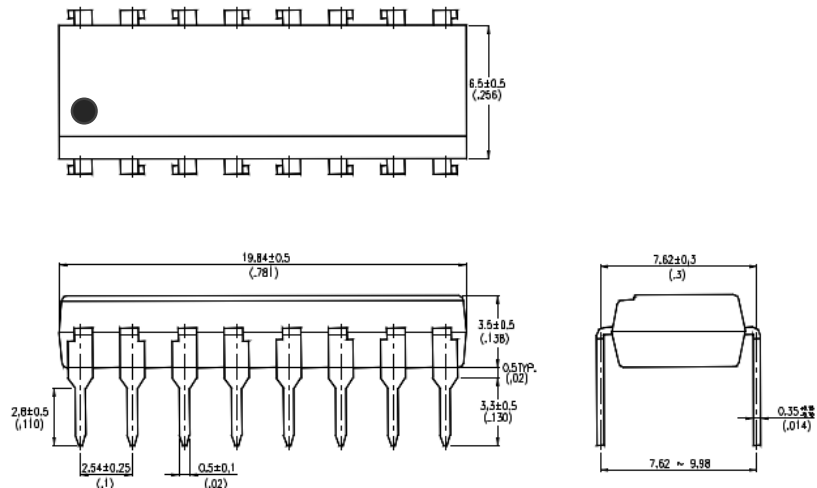
PS2505-1



PS2505-2



PS2505-4

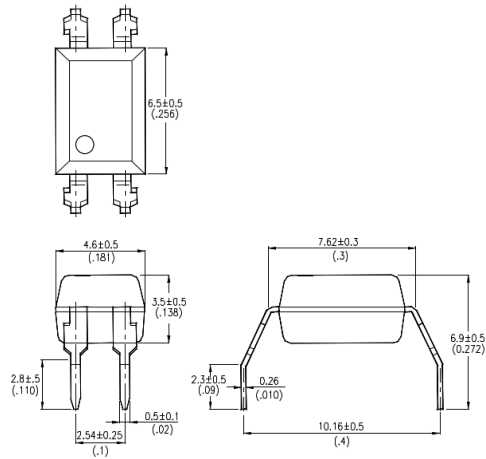


PS2505-1, PS2505-2, PS2505-4

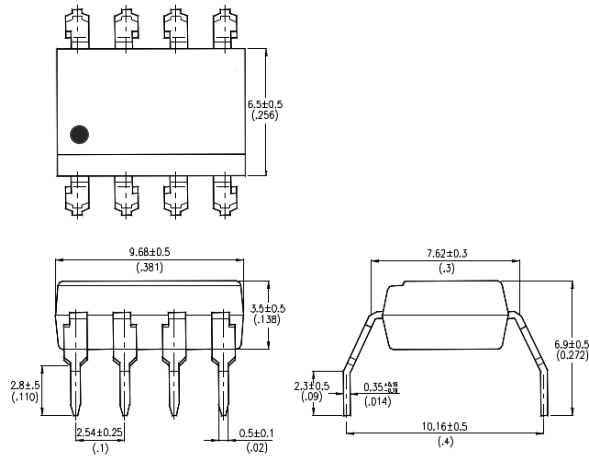
PACKAGE DIMENSIONS in mm (inch)

G Form

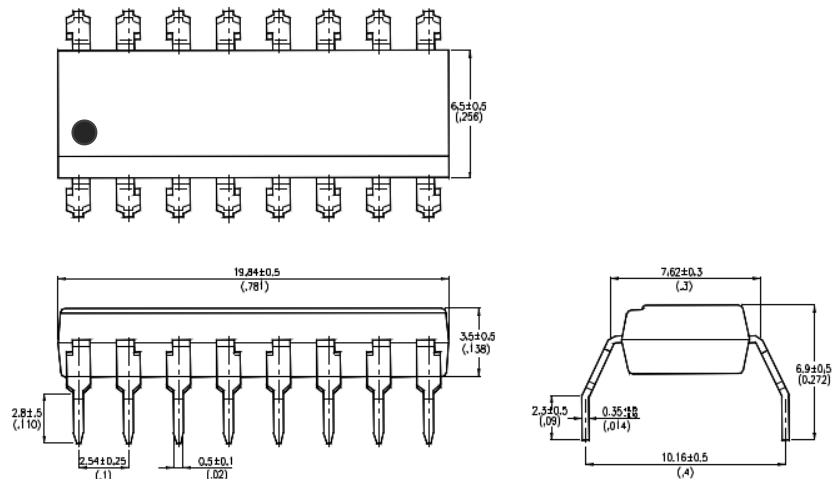
PS2505-1G



PS2505-2G



PS2505-4G

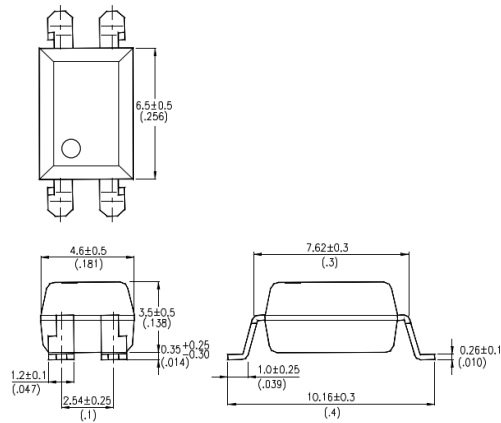


PS2505-1, PS2505-2, PS2505-4

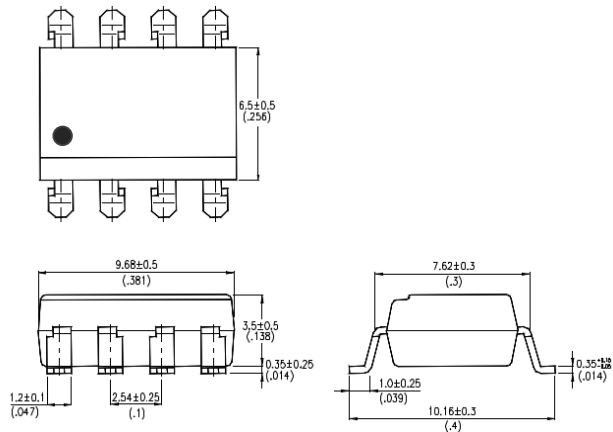
PACKAGE DIMENSIONS in mm (inch)

SMD

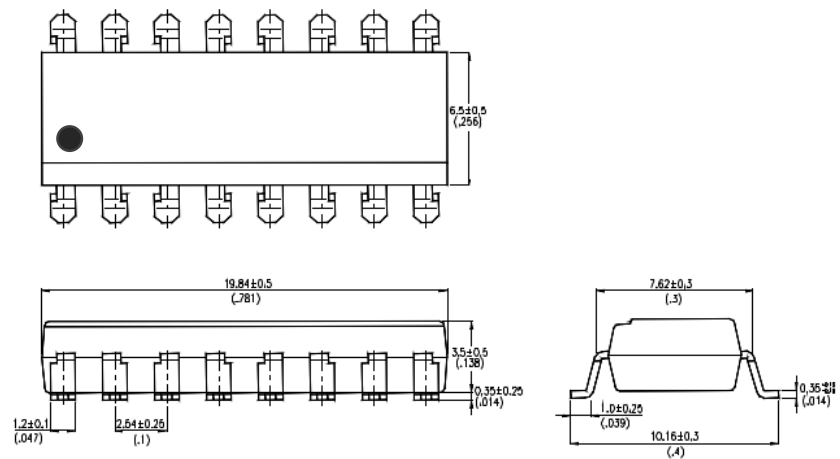
PS2505-1SM



PS2505-2SM



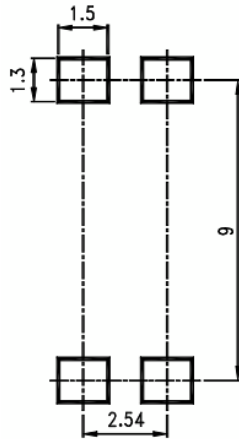
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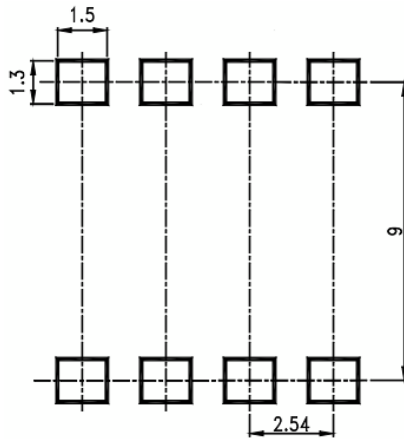
PS2505-1, PS2505-2, PS2505-4

RECOMMENDED PAD LAYOUT FOR SMD (mm)

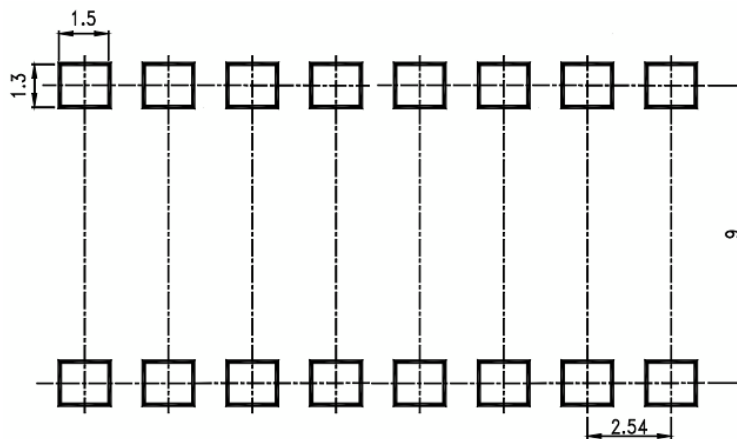
PS2505-1SM



PS2505-2SM



PS2505-4SM

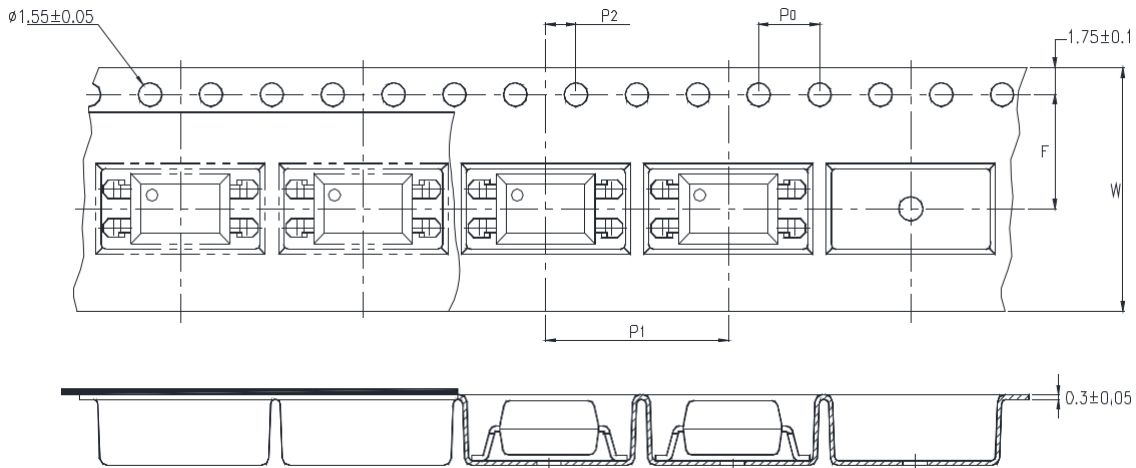




PS2505-1, PS2505-2, PS2505-4

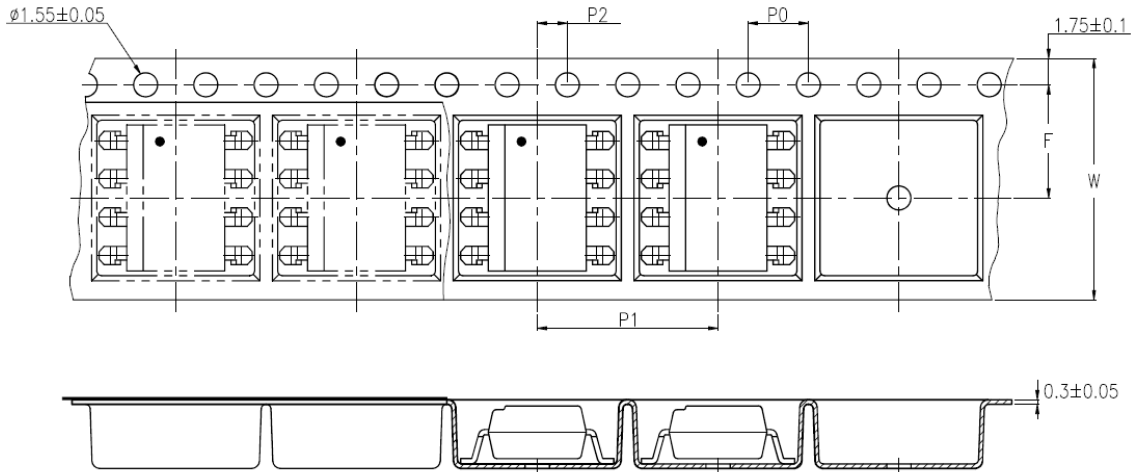
TAPE AND REEL PACKAGING

PS2505-1SMT&R



PS2505

-2SMT&R

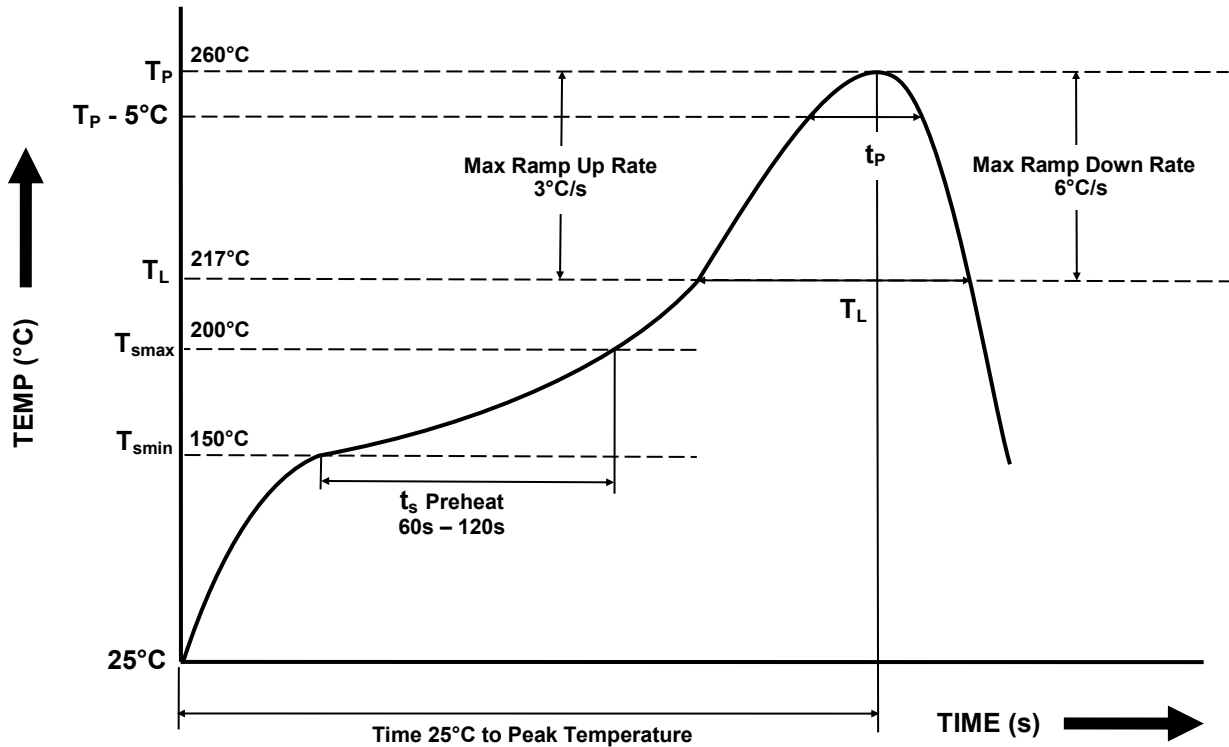


Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	12 ± 0.1 (0.472)



PS2505-1, PS2505-2, PS2505-4

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 ($T_P - 5^\circ\text{C}$) - 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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