



Features

- High isolation 5300 VRMS
- DC input with transistor output
- Operating temperature range - 55 °C to 125 °C
- RoHS compliance
- REACH compliance
- Halogen free
- Regulatory Approvals
 - UL - UL1577 (Pending Approval)
 - VDE - EN60747-5-5 (Pending Approval)
 - CQC – GB4943.1, GB8898 (Pending Approval)
 - IEC60065, IEC60950 (Pending Approval)

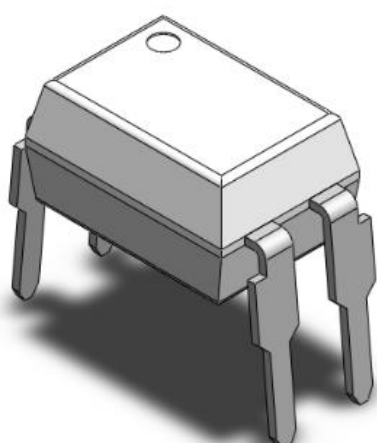
Description

The CT521-1GB consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a DIP package.

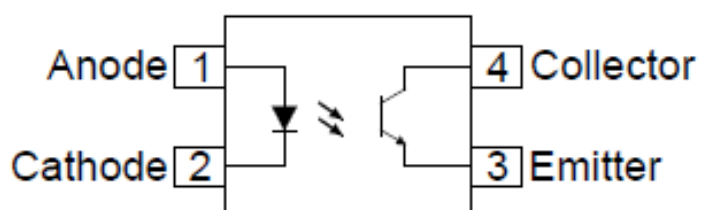
Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

Package Outline



Schematic



CT521-1

**CT521-1GB****DC DIP Phototransistor Optocoupler****Absolute Maximum Rating at 25°C**

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	5300	V _{RMS}	
P _{TOT}	Total power dissipation	200	mW	
T _{OPR}	Operating temperature	-55 ~ +125	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
Emitter				
I _F	Forward current	60	mA	
I _{F(TRANS)}	Peak transient current (≤1μs P.W,300pps)	1000	mA	
V _R	Reverse voltage	6	V	
P _D	Emitter power dissipation	100	mW	
Detector				
P _C	Detector power dissipation	150	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	7	V	
I _C	Collector Current	80	mA	

**Electrical Characteristics** $T_A = 25^\circ\text{C}$ (unless otherwise specified)**Emitter Characteristics**

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$	-	1.25	1.4	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	30	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 100\mu\text{A}$	55	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 100\mu\text{A}$	7	-	-	V	
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 24\text{V}, I_F = 0\text{mA}$	-	-	100	nA	
		$V_{CE} = 24\text{V}, I_F = 0\text{mA}, T_A = 85^\circ\text{C}$	-	-	50	μA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
CTR	Current Transfer Ratio	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	100	-	600	%	
		$I_F = 1\text{mA}, V_{CE} = 0.4\text{V}$	30	-	-	%	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = 1\text{mA}, I_C = 0.2\text{mA}$	-	-	0.4	V	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	5×10^{10}	-	-	Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	1	pF	

Switching Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
t_r	Rise Time	$I_C = 2\text{mA}, V_{CE} = 2\text{V}$ $R_L = 100\Omega$	-		16	μs	
t_f	Fall Time		-		16		
t_{on}	Turn-on time		-		20	μs	
t_{off}	Turn-off time		-		20		



Typical Characteristic Curves

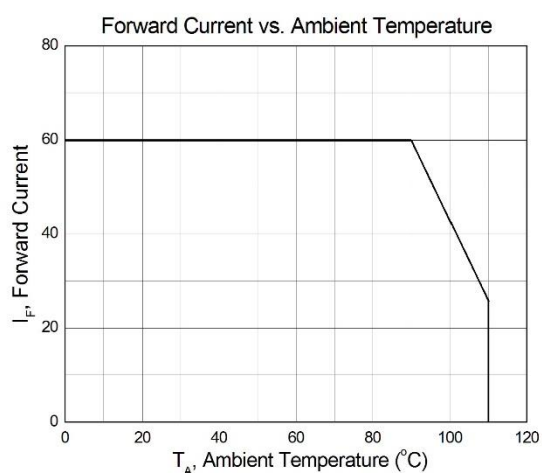


Figure 1

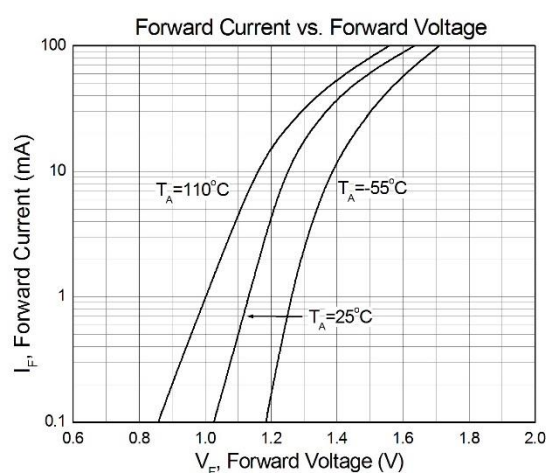


Figure 2

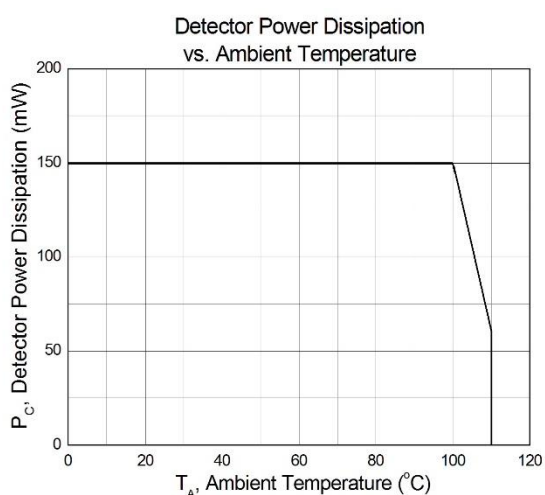


Figure 3

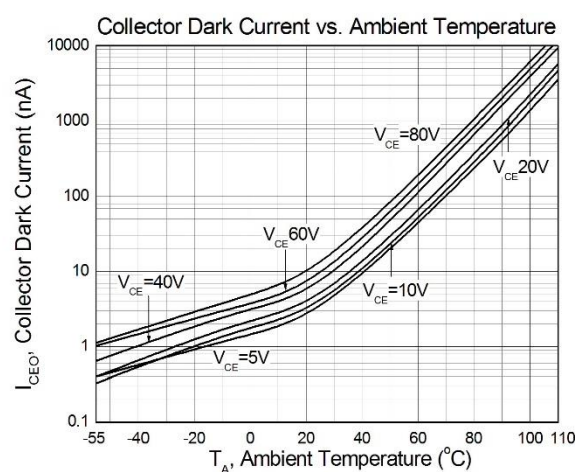


Figure 4

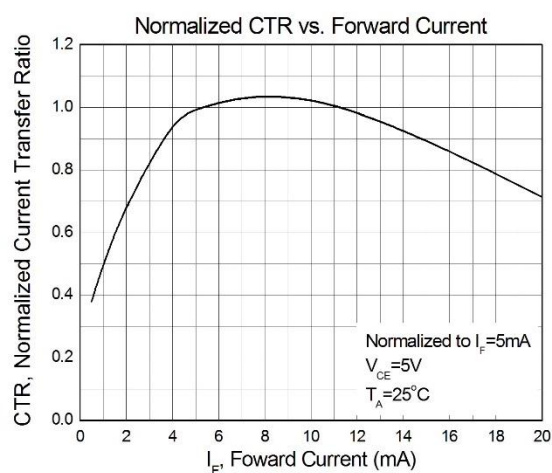


Figure 5

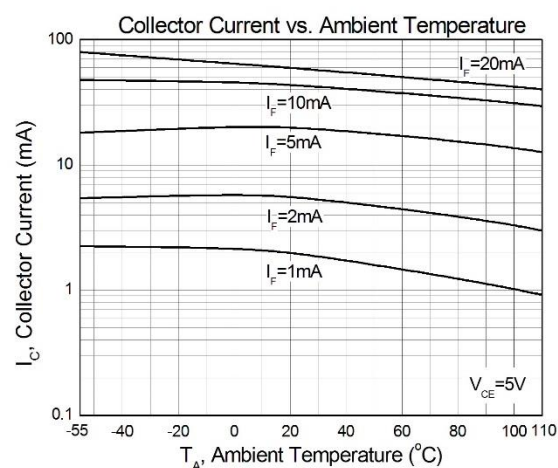


Figure 6

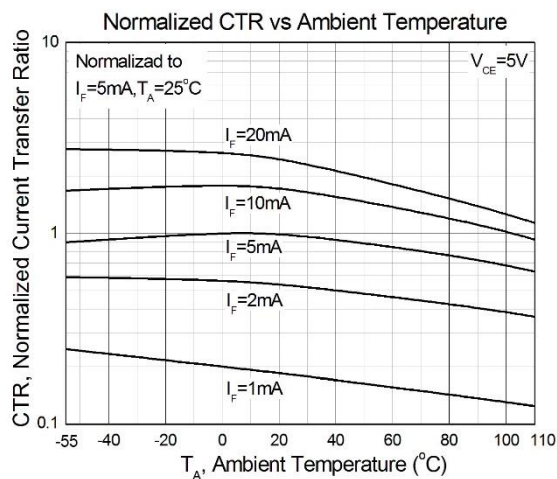


Figure 7

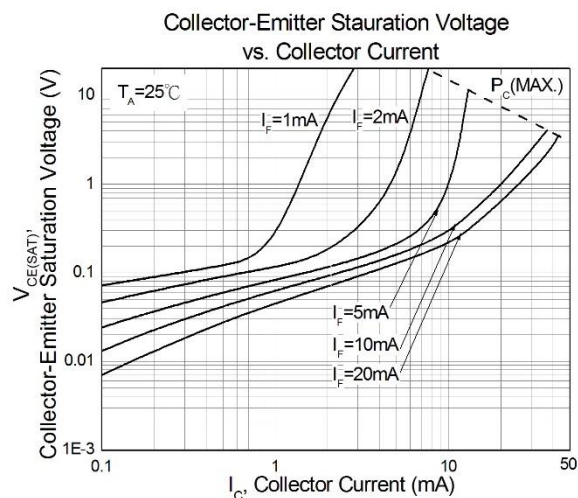


Figure 8

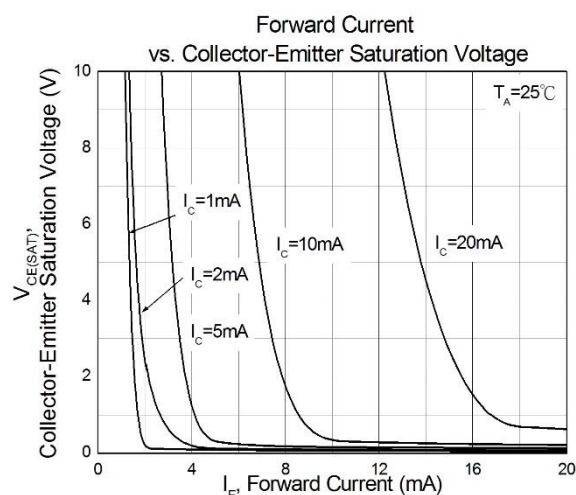


Figure 9

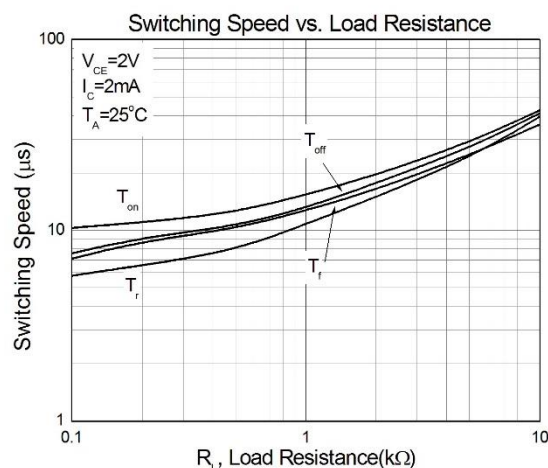


Figure 10

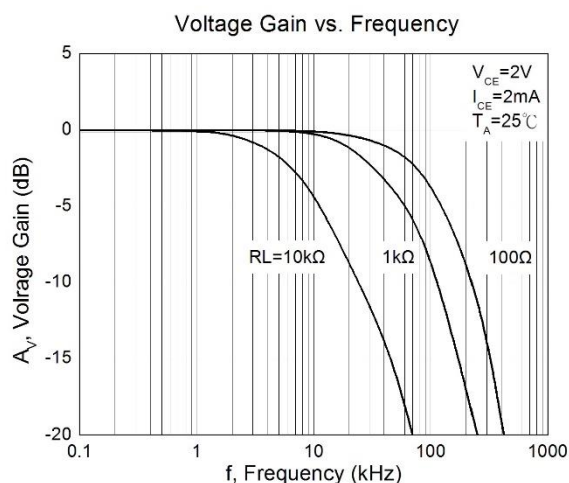


Figure 11

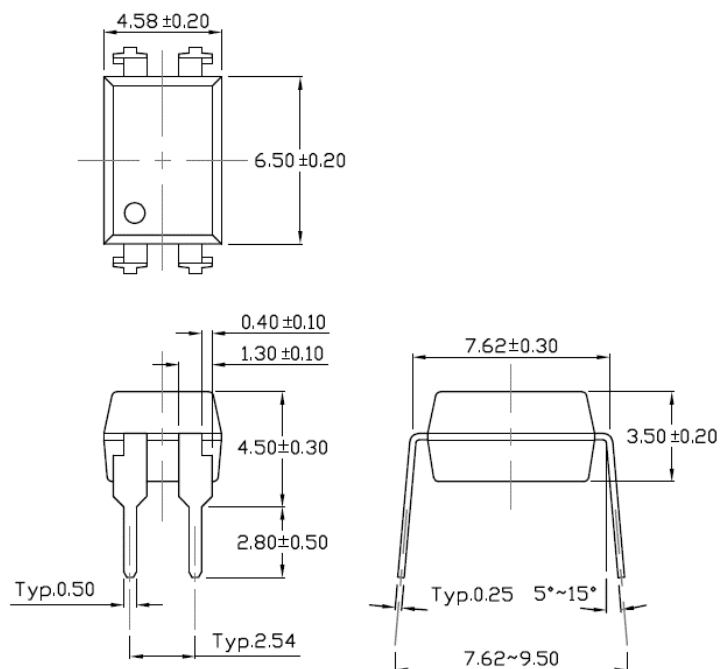


CT521-1GB

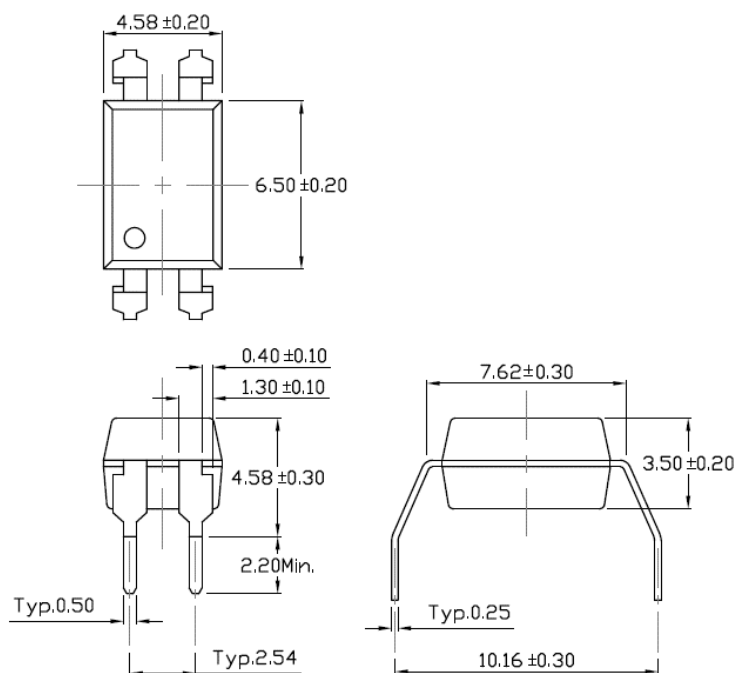
DC DIP Phototransistor Optocoupler

Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole



Gullwing (400mil) Lead Forming – Through Hole (M Type)

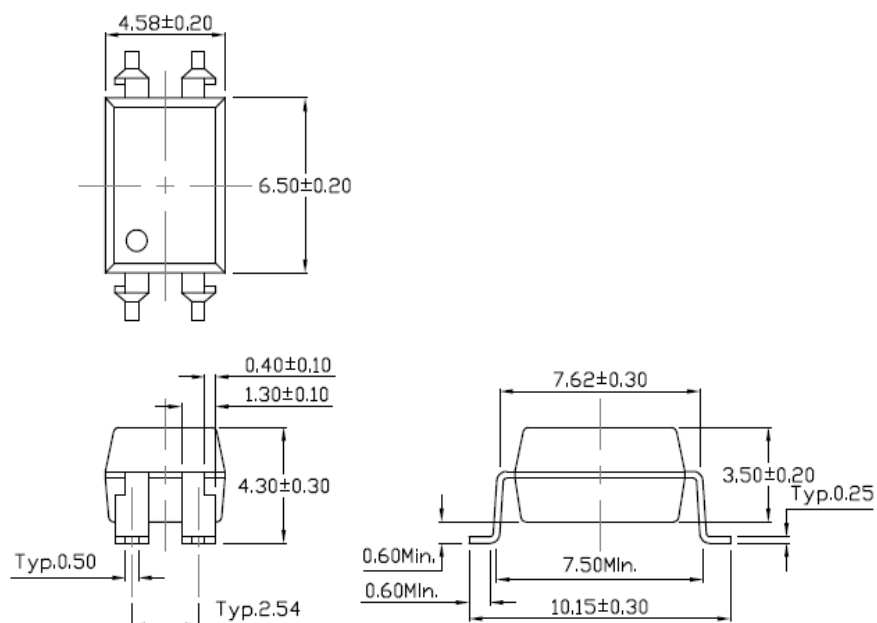




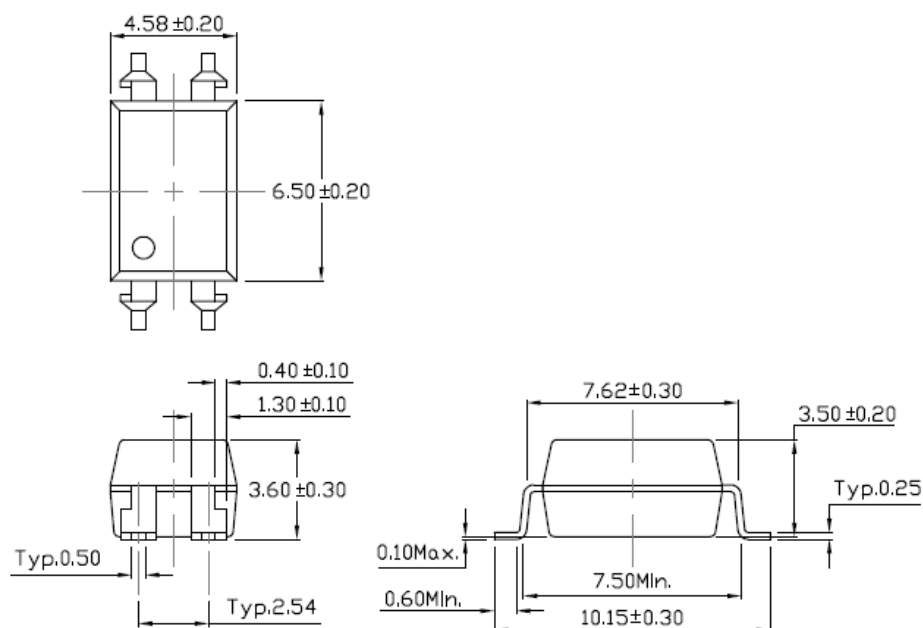
CT521-1GB

DC DIP Phototransistor Optocoupler

Surface Mount Lead Forming (S Type)



Surface Mount (Low Profile) Lead Forming (SL Type)

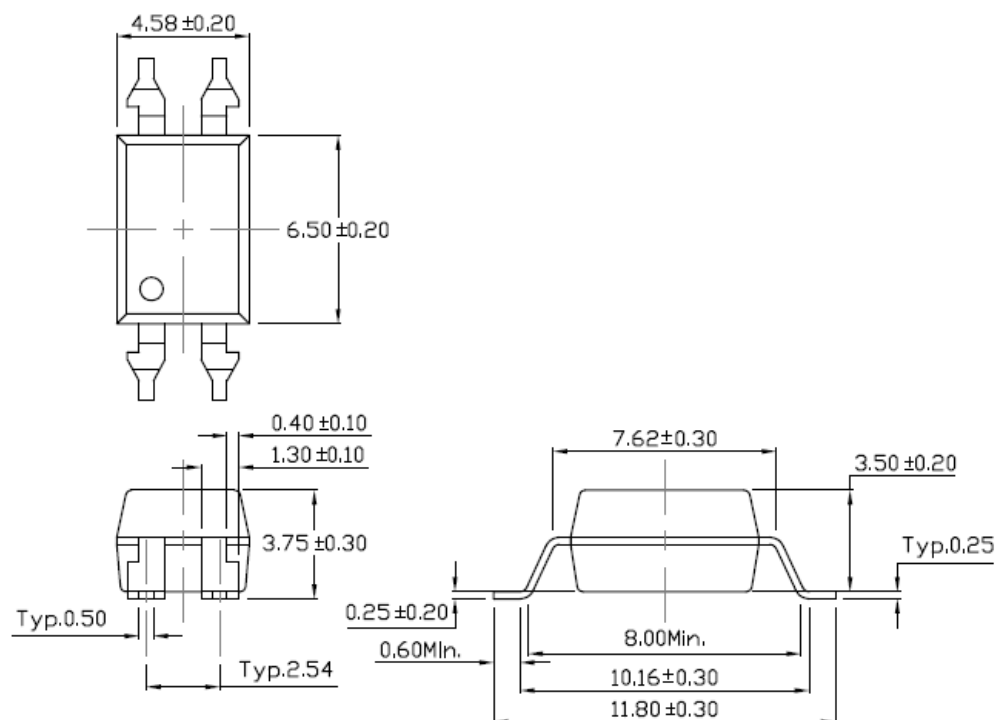




CT521-1GB

DC DIP Phototransistor Optocoupler

Surface Mount (Gullwing) Lead Forming (SLM Type)



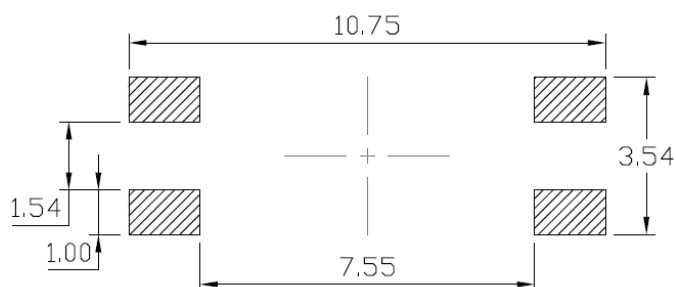


CT521-1GB

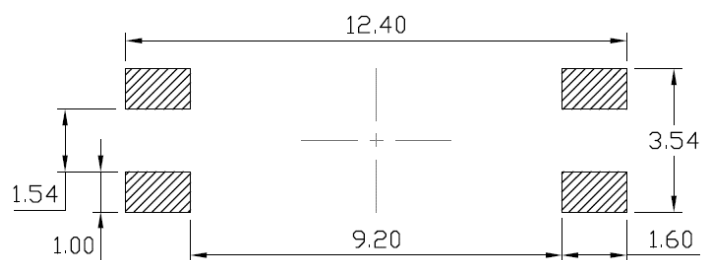
DC DIP Phototransistor Optocoupler

Recommended Solder Mask *Dimensions in mm unless otherwise stated*

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming



Surface Mount (Gullwing) Lead Forming



Marking Information



Note:

- CT : Denotes "CT Micro"
- 521-1 : Part Number
- GB : CTR Rank
- V : VDE Safety Option (V or none)
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code



CT521-1GB

DC DIP Phototransistor Optocoupler

Ordering Information

CT521-1GB(V)(W)(Y)

CT : Denotes “CT Micro”
521-1 : Part Number
GB : CTR Rank
V : VDE Safety Option(V or none)
W : Lead form option (S, SL, SLM, M or none)
Y : Tape and reel option (T1, T2 or none)

Option	Description	Quantity
None	Standard 4 Pin DIP	100 Units/Tube
M	Gullwing (400mil) Lead Forming	100 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1500 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1500 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1500 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1500 Units/Reel
SLM(T1)	Surface Mount (Gullwing) Lead Forming– With Option 1 Taping	1500 Units/Reel
SLM(T2)	Surface Mount (Gullwing) Lead Forming – With Option 2 Taping	1500 Units/Reel



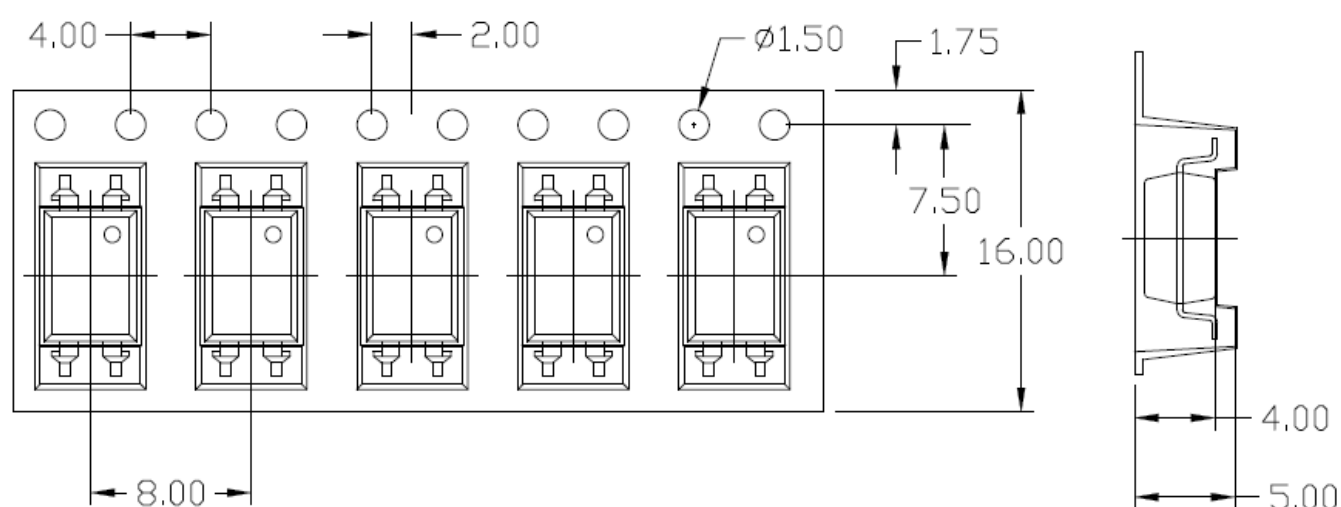
CT521-1GB

DC DIP Phototransistor Optocoupler

Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

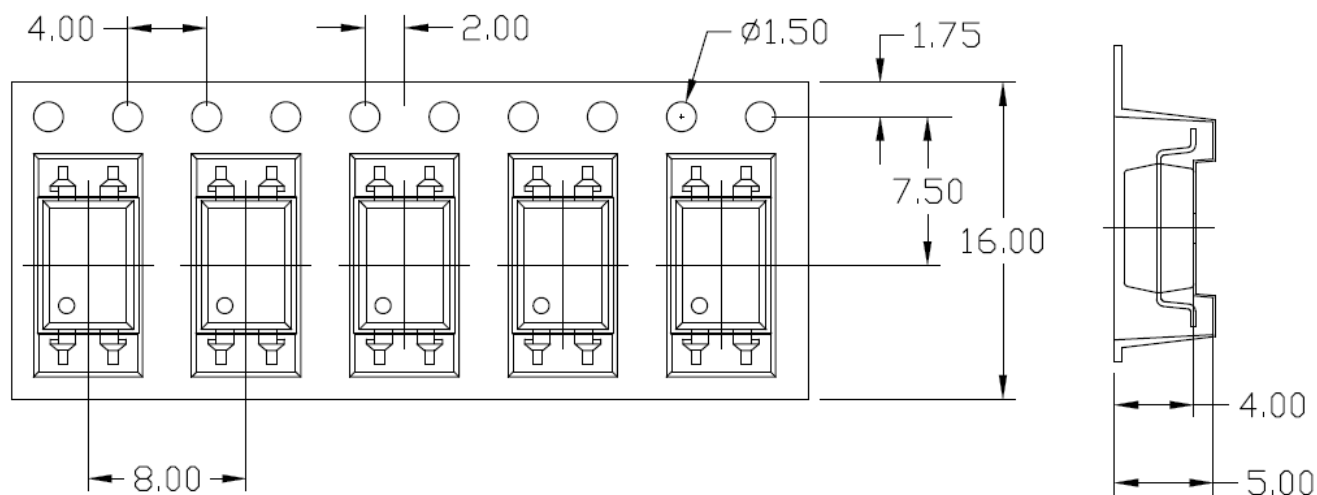
Option S(T1) & SL(T1)

Input Direction



Option S(T2) & SL(T2)

Input Direction



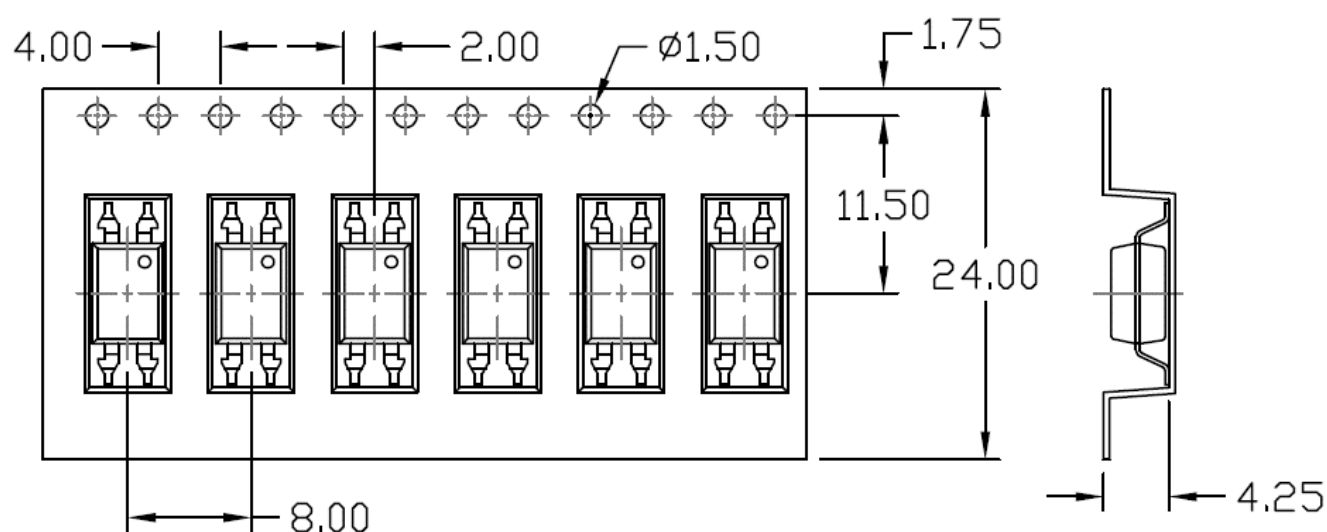


CT521-1GB

DC DIP Phototransistor Optocoupler

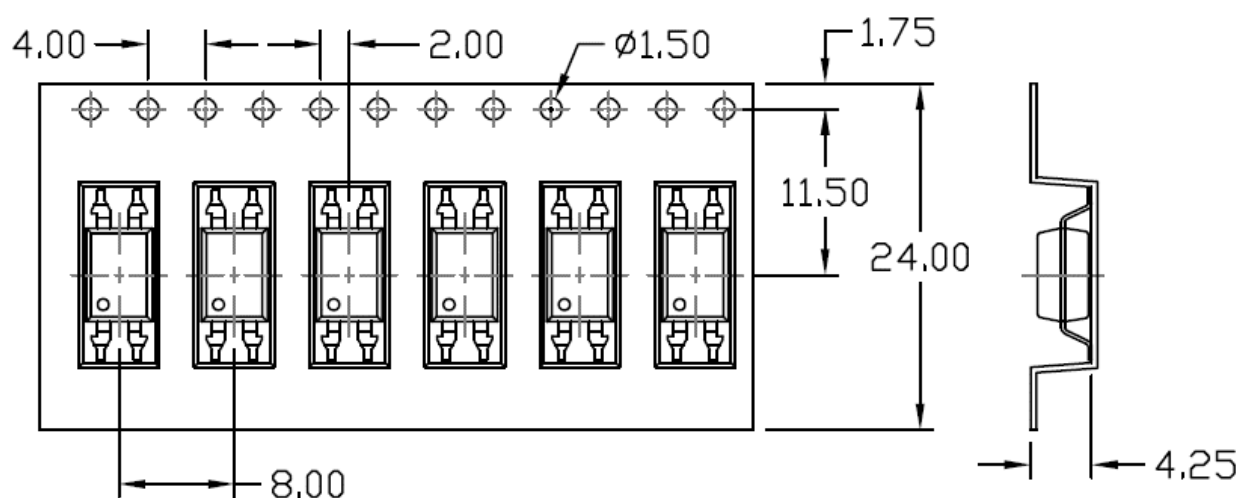
Option SLM(T1)

Input Direction



Option SLM(T2)

Input Direction



**Wave soldering** (JEDEC22A111 compliant)

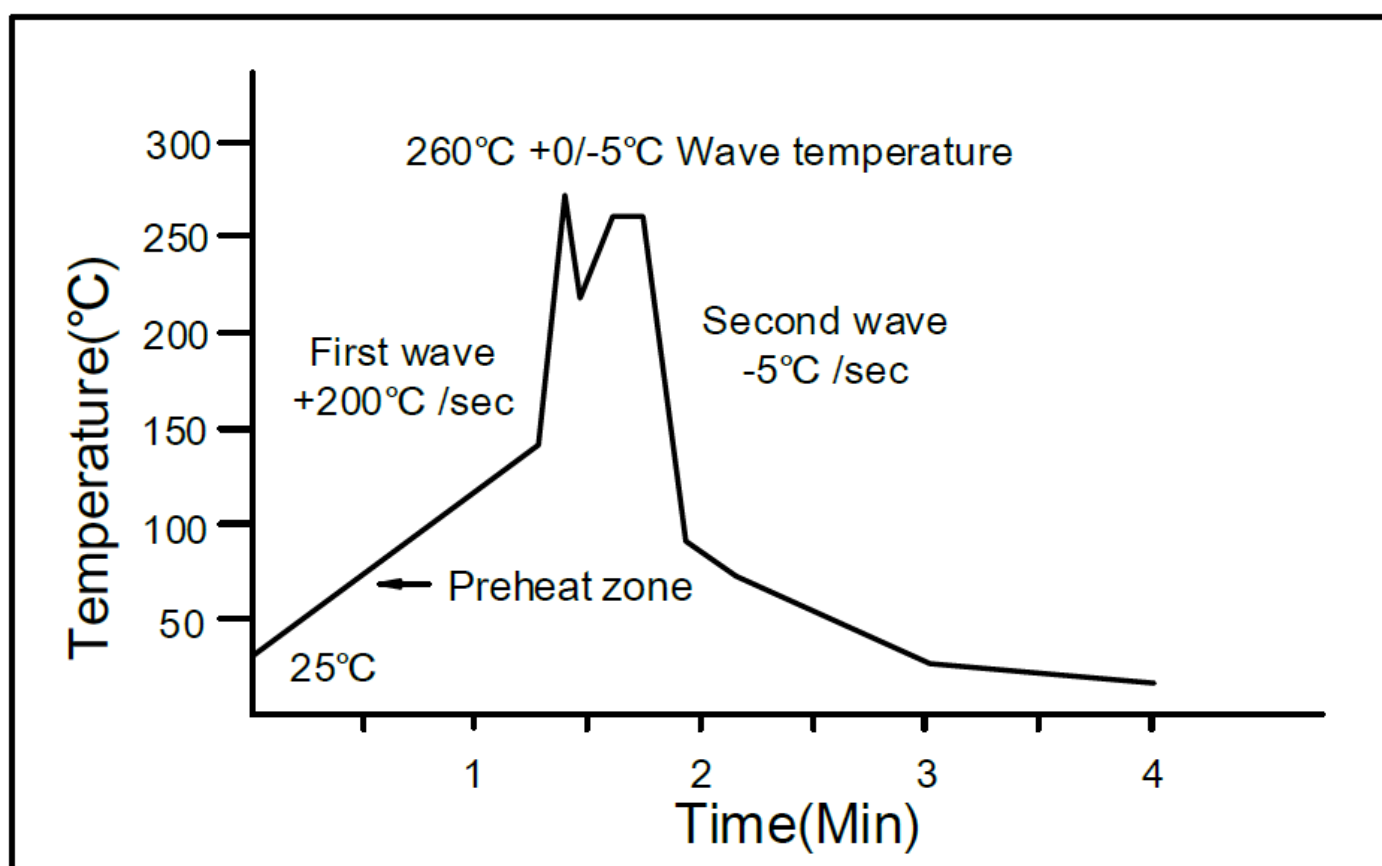
One time soldering is recommended within the condition of temperature.

Temperature: $260 \pm 5^\circ\text{C}$.

Time: 10 sec.

Preheat temperature: 25 to 140°C .

Preheat time: 30 to 80 sec.

**Hand soldering by soldering iron**

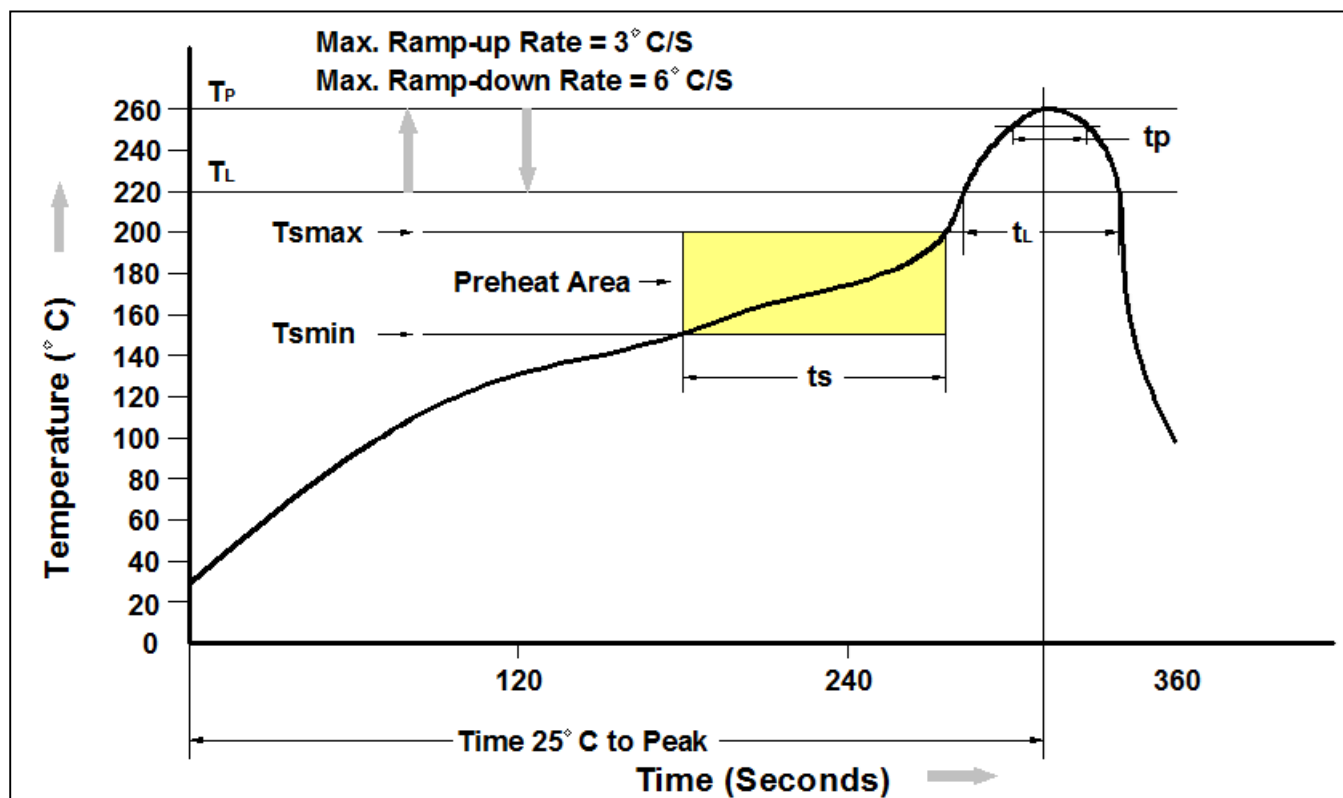
Allow single lead soldering in every single process.

One time soldering is recommended. Temperature: $350 \pm 5^\circ\text{C}$

Time: 3 sec max.



Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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