

PROGRAMMABLE CONTROLLERS

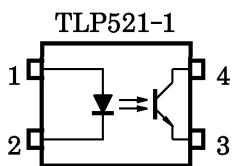
AC/DC-INPUT MODULE

SOLID STATE RELAY

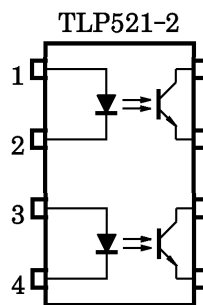
The UMW TLP521-1,-2 and -4 consist of a photo-transistor optically coupled to a gallium arsenide infrared emitting diode. The TLP521-2 offers two isolated channels in an eight lead plastic DIP package, while the TLP521-4 provides four isolated channels in a sixteen plastic DIP package.

- Collector-Emitter Voltage : 55 V (min)
- Current Transfer Ratio : 50% (min)
- Rank GB : 100% (min)
- Isolation Voltage : 5000Vrms (high)
- UL Approved:UL1577,File No.E492440

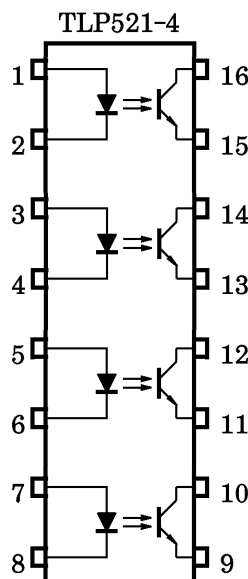
PIN CONFIGURATIONS (TOP VIEW)



1 : ANODE
2 : CATHODE
3 : EMITTER
4 : COLLECTOR

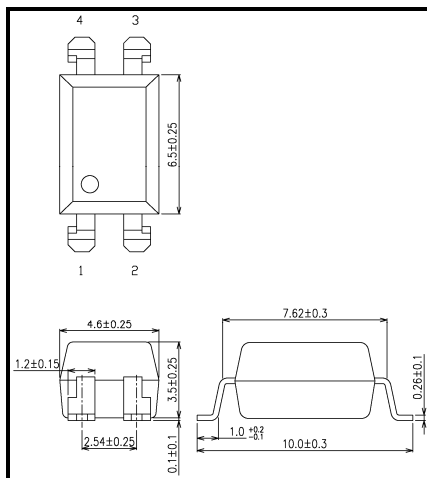


1, 3 : ANODE
2, 4 : CATHODE
5, 7 : EMITTER
6, 8 : COLLECTOR



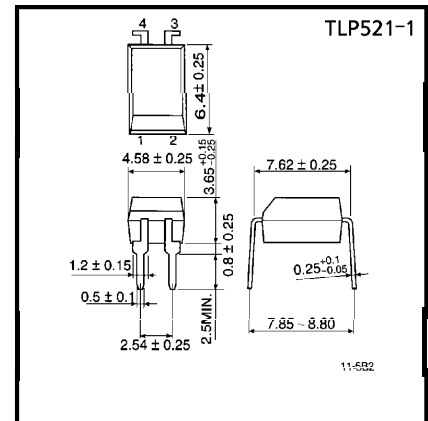
1, 3, 5, 7 : ANODE
2, 4, 6, 8 : CATHODE
9, 11, 13, 15 : EMITTER
10, 12, 14, 16 : COLLECTOR

Unit: mm

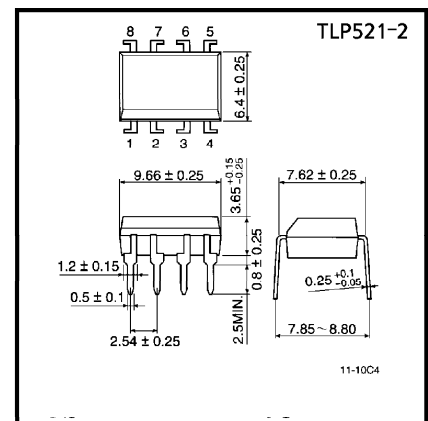


•Weight: 0.31g

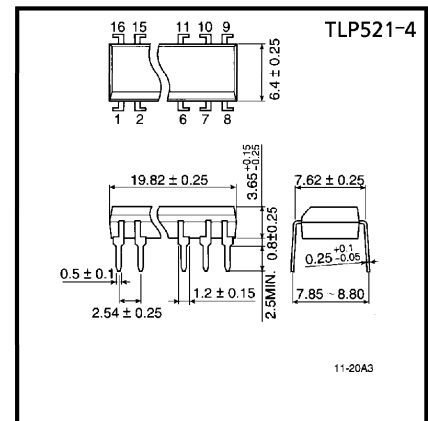
Unit in mm



Weight : 0.26 g



Weight : 0.54 g



Weight : 1.1 g

MAXIMUM RATINGS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	RATING		UNIT
			TLP521-1	TLP521-2 TLP521-4	
LED	Forward Current	I _F	70	50	mA
	Forward Current Derating	ΔI _F / °C	−0.93 (Ta ≥ 50°C)	−0.5 (Ta ≥ 25°C)	mA / °C
	Pulse Forward Current	I _{FP}	1 (100 μ pulse, 100 pps)		A
	Reverse Voltage	V _R	5		V
	Junction Temperature	T _j	125		°C
DETECTOR	Collector-Emitter Voltage	V _{CEO}	55		V
	Emitter-Collector Voltage	V _{ECO}	7		V
	Collector Current	I _C	50		mA
	Collector Power Dissipation (1 Circuit)	P _C	150	100	mW
	Collector Power Dissipation Derating (1 Circuit, Ta ≥ 25°C)	ΔP _C / °C	−1.5	−1.0	mW / °C
	Junction Temperature	T _j	125		°C
	Storage Temperature Range	T _{stg}	−55~125		°C
	Operating Temperature Range	T _{opr}	−55~100		°C
	Lead Soldering Temperature	T _{sol}	260 (10 s)		°C
	Total Package Power Dissipation	P _T	200	150	mW
	Total Package Power Dissipation Derating (Ta ≥ 25°C)	ΔP _T / °C	−2.5	−1.5	mW / °C
	Isolation Voltage	BV _S	2500 (AC, 1 min., R.H. ≤ 60%) (Note 1)		Vrms

(Note 1) : Device considered a two terminal device : LED side pins shorted together and DETECTOR side pins shorted together.

RECOMMENDED OPERATING CONDITIONS

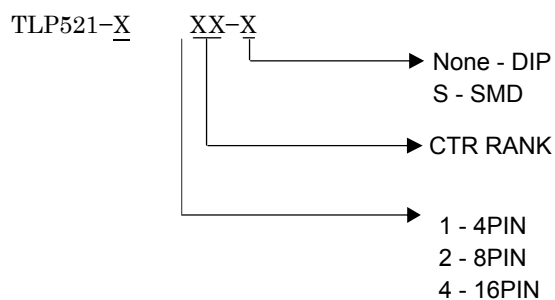
CHARACTERISTIC	SYMBOL	Min	Typ.	Max	UNIT
Supply Voltage	V _{CC}	—	5	24	V
Forward Current	I _F	—	16	25	mA
Collector Current	I _C	—	1	10	mA
Operating Temperature	T _{opr}	−25	—	85	°C

TYPE	CLASSI- FICATION (*1)	CURRENT TRANSFER RATIO (%) (I _C / I _F)		MARKING OF CLASSIFICATION
		I _F = 5 mA, V _{CE} = 5 V, Ta = 25°C		
		Min	Max	
TLP521	A	50	600	BLANK, Y, Y [■] , G, G [■] , B, B [■] , GB
	Rank Y	50	150	Y, Y [■]
	Rank GR	100	300	G, G [■]
	Rank BL	200	600	B, B [■]
	Rank GB	100	600	G, G [■] , B, B [■] , GB
TLP521-2	A	50	600	BLANK, GR, BL, GB
TLP521-4	Rank GB	100	600	GR, BL, GB

● Product Naming System

Type of package used for shipment is denoted by a symbol suffix after a product number. The method of classification is as below.

(Example)



INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
LED	Forward Voltage	V_F	$I_F = 10 \text{ mA}$	1.0	1.15	1.3	V
	Reverse Current	I_R	$V_R = 5 \text{ V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1 \text{ MHz}$	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.5 \text{ mA}$	55	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 0.1 \text{ mA}$	6	—	—	V
	Collector Dark Current	I_{CEO}	$V_{CE} = 24 \text{ V}$	—	—	100	nA
			$V_{CE} = 24 \text{ V}, T_a = 85^\circ\text{C}$	—	2	50	μA
	Capacitance (Collector to Emitter)	C_{CE}	$V = 0, f = 1 \text{ MHz}$	—	10	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 5 \text{ mA}, V_{CE} = 5 \text{ V}$ Rank GB	50	—	600	%
			100	—	600	
Saturated CTR	$I_C / I_F(\text{sat})$	$I_F = 1 \text{ mA}, V_{CE} = 0.4 \text{ V}$ Rank GB	—	60	—	%
			30	—	—	
Collector-Emitter Saturation Voltage	$V_{CE(\text{sat})}$	$I_C = 2.4 \text{ mA}, I_F = 8 \text{ mA}$	—	—	0.4	V
		$I_C = 0.2 \text{ mA}, I_F = 1 \text{ mA}$	—	0.2	—	
		Rank GB	—	—	0.4	

ISOLATION CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
Capacitance (Input to Output)	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	—	10^{11}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	Vdc

SWITCHING CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	Min	Typ.	Max	UNIT
Rise Time	t_r	$V_{CC} = 10\text{ V}$ $I_C = 2\text{ mA}$ $R_L = 100\ \Omega$	—	2	—	μs
Fall Time	t_f		—	3	—	
Turn-on Time	t_{on}		—	3	—	
Turn-off Time	t_{off}		—	3	—	
Turn-on Time	t_{ON}	$R_L = 1.9\text{ k}\Omega$ (Fig.1) $V_{CC} = 5\text{ V}$, $I_F = 16\text{ mA}$	—	2	—	μs
Storage Time	t_s		—	15	—	
Turn-off Time	t_{OFF}		—	25	—	

Fig.1 : SWITCHING TIME TEST CIRCUIT

