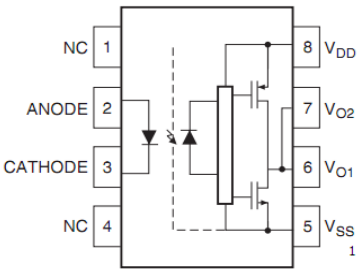
Features

- Peak Output Current: IOP = ±2.5A (max)
- Threshold Input Current: IFLH = 5 mA (max)
- Common mode transient immunity : ±25kV/μs (min）
- Under voltage lock out (UVLO) protection with hysteresis
- RoHS and REACH Compliance



Note: (1) A 0.1uF bypass capacitor must be connected between pins 5 and 8.

Description

The ATLP250 consists of a LED optically coupled to an integrated circuit with a power output stage. This optocoupler is ideally suited for driving power IGBTs and MOSFETs used in motor control inverter applications. The high operating voltage range of the output stage provides the drive voltages required by gate-controlled devices.

Applications

- Isolated IGBT/Power MOSFET gate drive
- Industrial Inverter
- AC brushless and DC motor drives
- Induction Heating


SMD-8


DIP-8

Package	Part No.	Packing Quantity
DIP-8	ATLP250E	50pcs /tube
SMD-8	ATLP250EH	1000pcs /reel

Truth Table

LED	V_{DD}-V_{EE} Positive Going	V_{DD}-V_{EE} Negative Going	V_O
OFF	0V to 30V	0V to 30V	Low
ON	0V to 11V	0V to 9.5V	Low
ON	11V to 13.5V	9.5V to 12V	Transition
ON	13.5V to 30V	12V to 30V	High

Absolute Maximum Ratings T_A = 25°C, unless otherwise specified

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameters	Ratings	Units	Notes
V_{ISO}	Isolation voltage (AC, 1 minute, 40 ~ 60% R.H.)	5000	V_{RMS}	1
T_{OPR}	Operating temperature	-40 ~ +110	^0C	
T_{STG}	Storage temperature	-55 ~ +125	^0C	
T_{SOL}	Soldering temperature (For 10 seconds)	260	^0C	2
P_T	Total Power Dissipation	300	mW	
Emitter				
I_F	Forward current	25	mA	
I_{FP}	Peak forward current (50% duty, 1ms P.W)	1	A	
V_R	Reverse voltage	5	V	
Detector				
P_D	Power dissipation	250	mW	
$V_{O(PEAK)}$	Peak Output Voltage	0 to 30	V	3
I_{OPH}	Output High Peak Current	2.5	A	4
I_{OPL}	Output Low Peak Current	2.5		
V_{CC}	Supply voltage	0 to 30	V	

Notes

1. AC for 1 minute, RH = 40 ~ 60%.
2. For 10 second peak
3. The $V_{O(PEAK)}$ voltage CAN NOT BE high than V_{CC}.
4. The I_O maximum pulse width = 10 μs, maximum duty cycle = 0.2%.

Electrical Characteristics

Over recommended operating conditions TA = –40 to 110 °C.

Typical values are measured at V_{CC}=30V, V_{EE}= GND, T_A = 25^{0}C (unless otherwise stated)

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	IF = 10mA	-	1.45	1.8	V	
V_R	Reverse Voltage	IR = 10μA	5.0	-	-	V	
$\Delta V_F/\Delta T_A$	Temperature coefficient of forward voltage	IF =10mA	-	-1.8	-	mV/°C	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{CCL}	Logic Low Supply Current	V_F = 0 to 0.8V, V_O= Open	-	1.5	5	mA	
I_{CCH}	Logic High Supply Current	I_F= 7mA to 10mA, V_O= Open	-	1.5	5		

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_{OH}	High Level Output Voltage	I_F= 10mA, I_O= -2.5A	V_{CC} - 6	-	-	V	
		I_F= 10mA, I_O= -100mA	V_{CC} - 4	-	-		
V_{OL}	Low Level Output Voltage	I_F= 0mA, I_O= 2.5A	-	-	V_{EE} + 6	V	
		I_F= 0mA, I_O= 100mA	-	-	V_{EE} + 4		
I_{OPH}	High Level Output Current	V_O= V_{CC}-3V	-	-	-1	A	1
		V_O= V_{CC}-6V	-	-	-2		1
I_{OPL}	Low Level Output Current	V_O= V_{EE}+3V	1	-	-	A	1
		V_O= V_{EE}+6V	2	-	-		1
I_{FLH}	Input Threshold Current	I_O= 0mA, V_O> 5V	-	1.4	5.0	mA	
V_{FHL}	Input Threshold Voltage	I_O= 0mA, V_O< 5V	0.8	-	-	V	
V_{UVLO+}	Under Voltage Lockout Threshold	I_O= 10mA, V_O> 5V	11	-	13.5	V	
V_{UVLO-}		I_O= 10mA, V_O< 5V	9.5	-	12.0		

Notes

1. The I_O maximum pulse width = 10 μs, maximum duty cycle = 0.2%.

Electrical Characteristics

Over recommended operating conditions TA = –40 to 110 °C.

Typical values are measured at V_{CC}=30V, V_{EE}= GND, T_A = 25^{0}C (unless otherwise stated)

Switching Characteristics

Symbol	*Parameters*	*Test Conditions*		*Min*	*Typ*	*Max*	*Units*	*Notes*
T_{PHL}	High to Low Propagation Delay	I_F= 7 to 16mA, C_L= 10nF, R_L= 10Ω, f= 10kHz, Duty = 50%, T_A= 25 ^{0}C		100	180	500	ns	
T_{PLH}	Low to High Propagation Delay			100	140	500	ns	
P_{WD}	Pulse Width Distortion				40	300	ns	
t_{PSK}	Propagation Delay Skew					40	ns	
t_r	Rise Time				20		ns	
t_f	Fall Time				20		ns	
$t_{UVLO(ON)}$	UVLO Turn On Delay	I_F= 10mA, V_O> 5V			3.5		µs	
$t_{UVLO(OFF)}$	UVLO Turn Off Delay	I_F= 10mA, V_O< 5V			3		µs	
$\|CM_H\|$	Common Mode Transient High	V_{CC}= 30V, T_A= 25 ^{0}C, V_{CM}= 1.5kV	I_F= 7 to 16mA	25			kV/µs	
$\|CM_L\|$	Common Mode Transient Low		I_F= 0mA	25			kV/µs	

Typical Characteristic Curves *T_A = 25°C, unless otherwise specified*

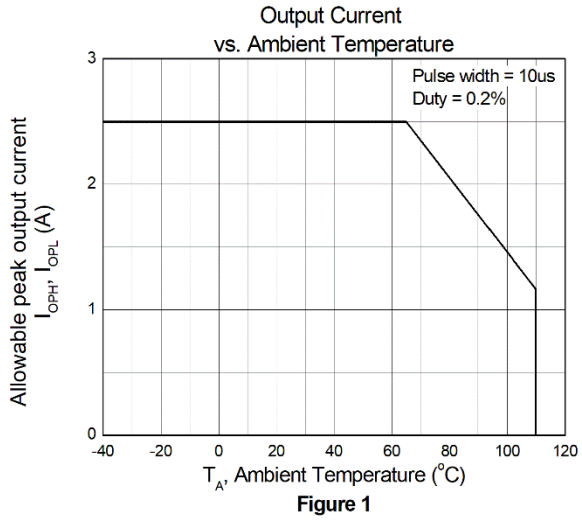


Figure 1

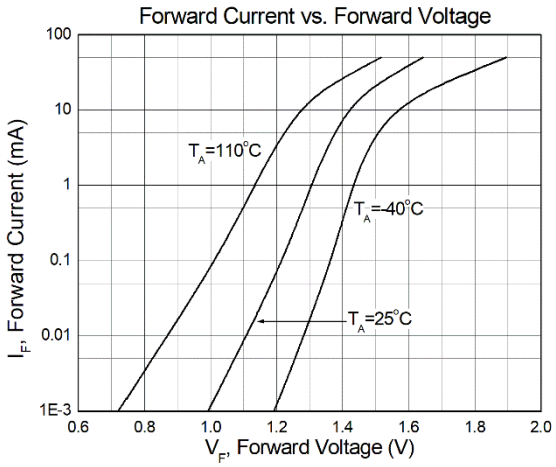


Figure 2

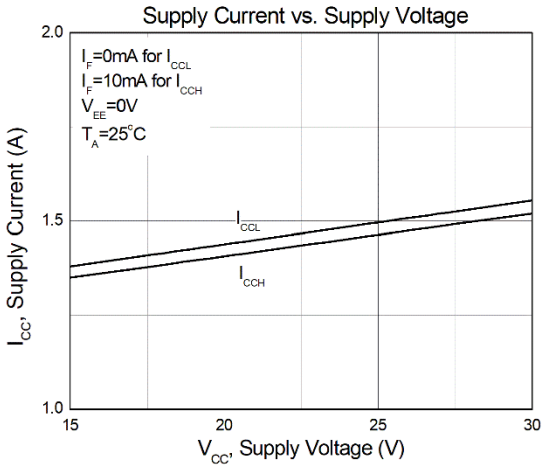


Figure 3

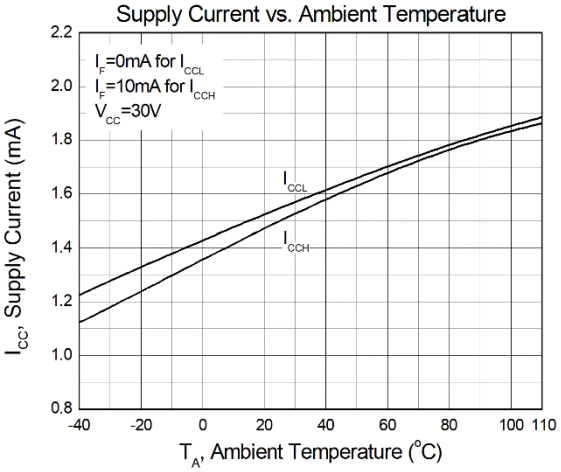


Figure 4

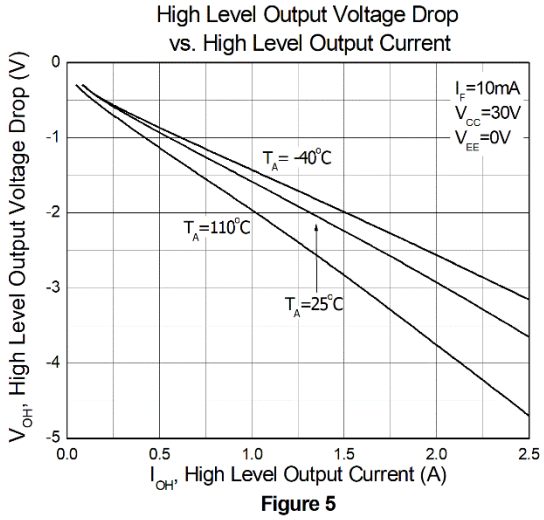


Figure 5

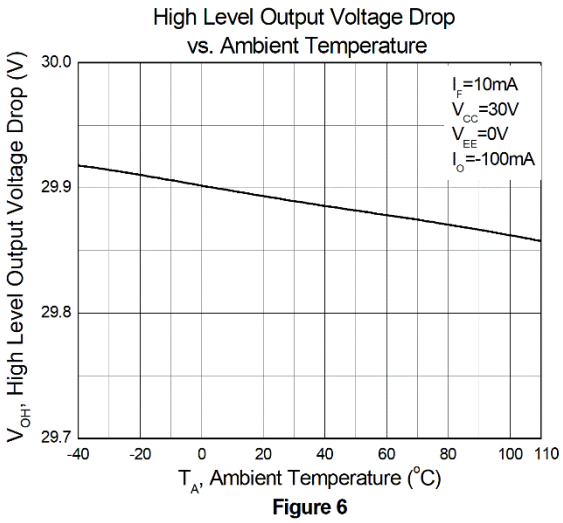


Figure 6

Typical Characteristic Curves *T_A = 25°C, unless otherwise specified*

High Level Output Current vs. Ambient Temperature

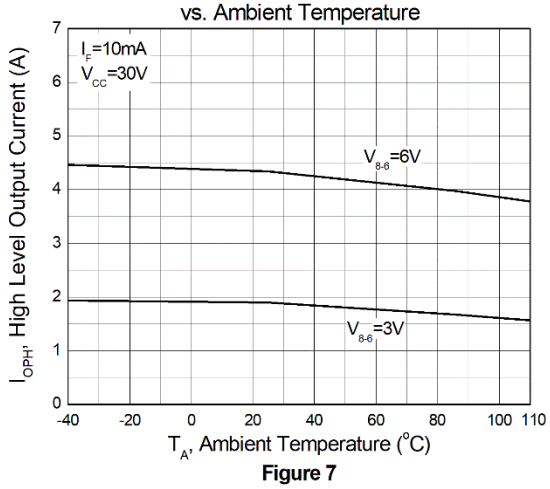


Figure 7

Low Level Output Voltage Drop vs. Low Level Output Current

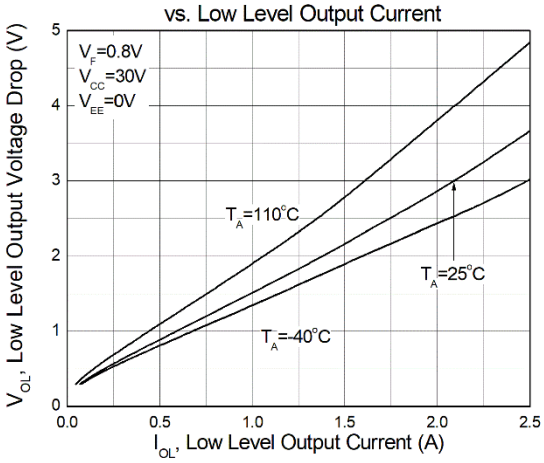


Figure 8

Low Level Output Voltage Drop vs. Ambient Temperature

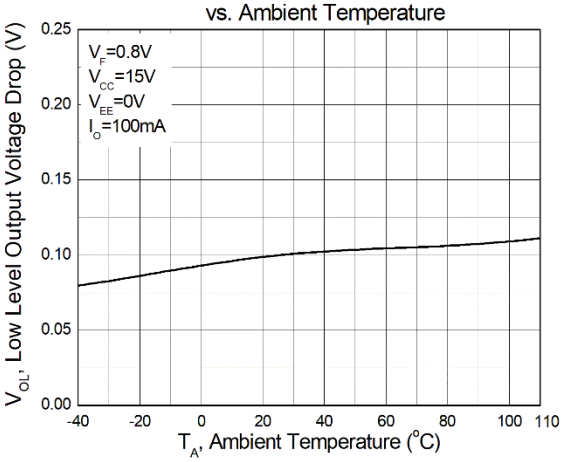


Figure 9

Low Level Output Current vs. Ambient Temperature

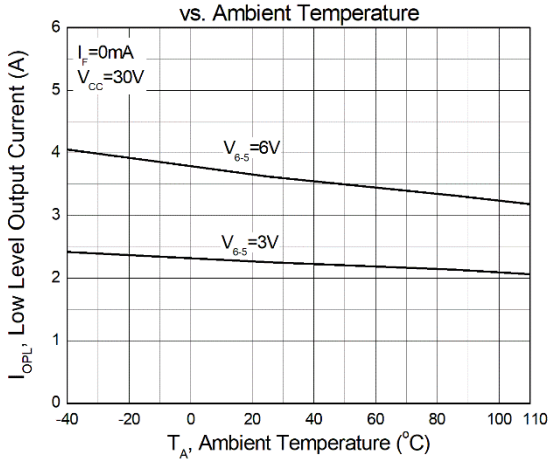


Figure 10

Threshold Input Current vs. Ambient Temperature

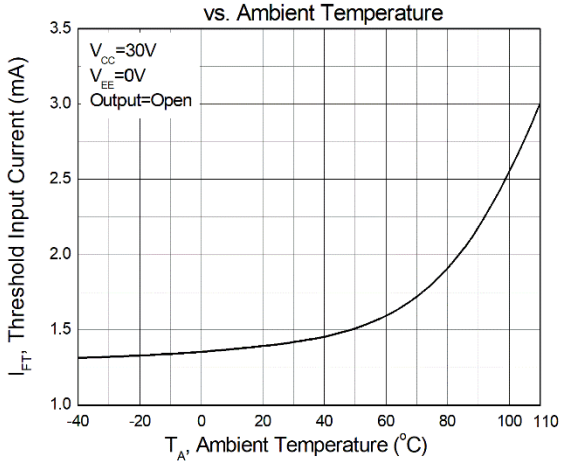


Figure 11

Output Voltage vs. Forward Current

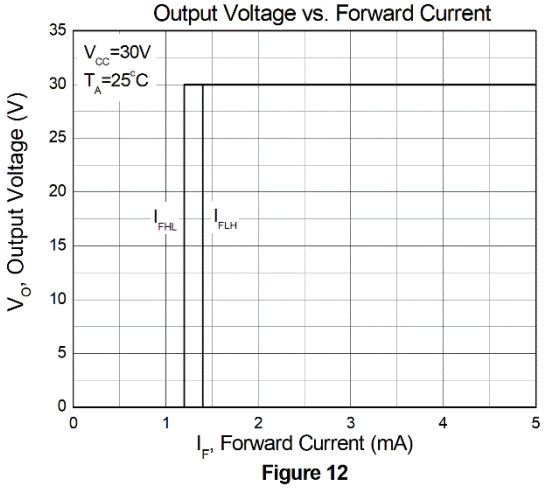


Figure 12

Typical Characteristic Curves *T_A = 25°C, unless otherwise specified*

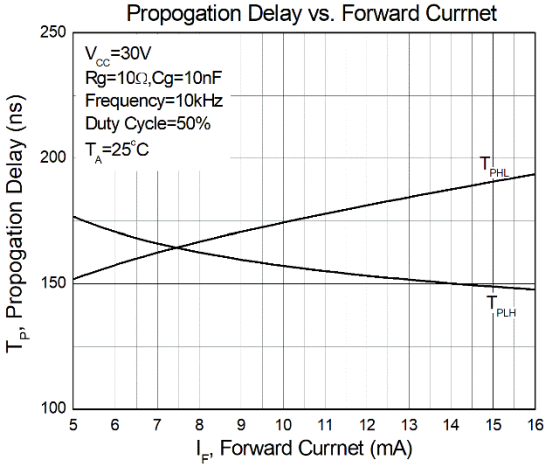


Figure 13

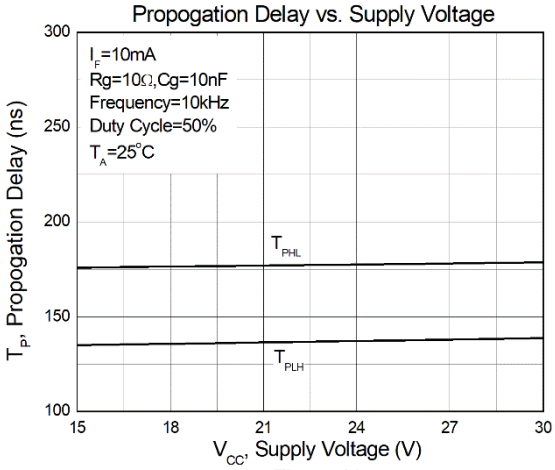


Figure 14

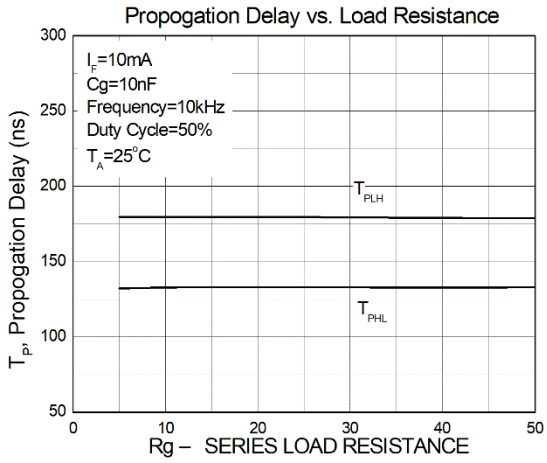


Figure 15

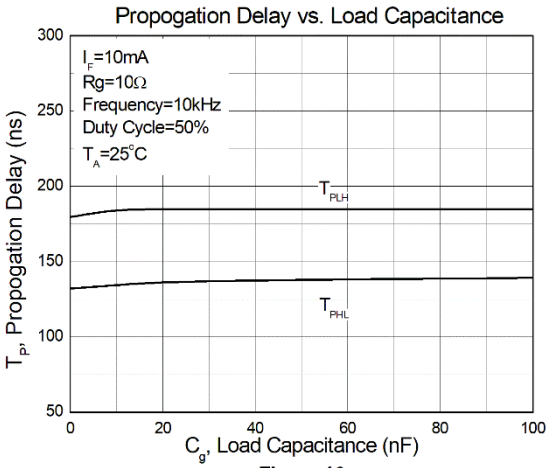


Figure 16

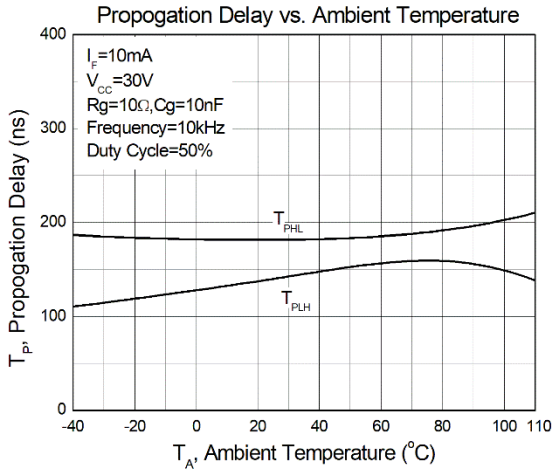
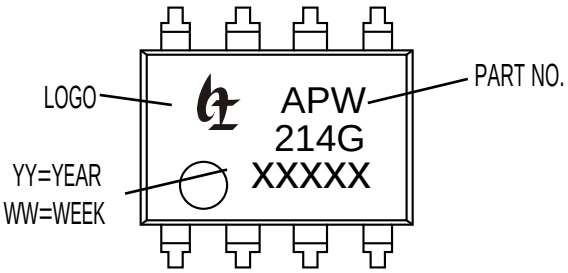


Figure 17

Dimensions and DIP-8 Package

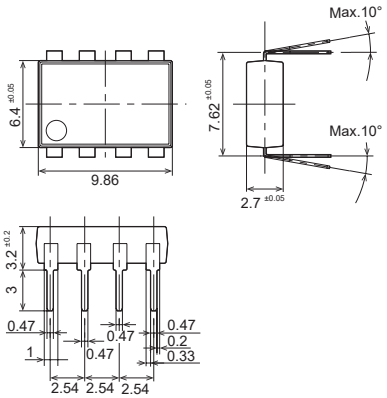
Unit: mm

Marking

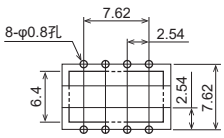


Lable

Through hole terminal type



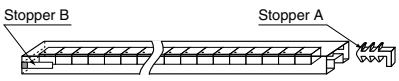
PC board pattern (Bottom view)



DIP Tape dimensions

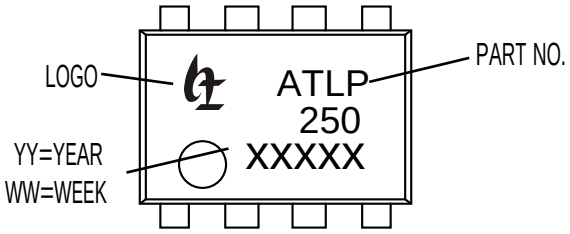
Unit : mm

Devices are packaged in a tube so that pin No. 1 is on the stopper B side. Observe correct orientation when mounting them on PC boards.

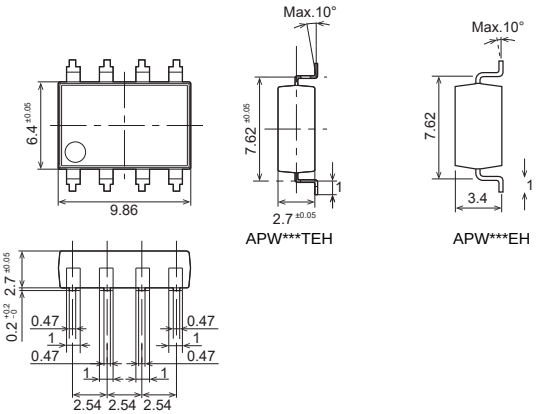


Dimensions and SMD-8 Package Unit: mm

Marking



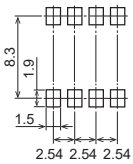
Surface mount terminal type



Lable

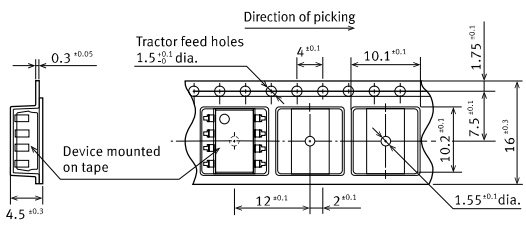
Recommended mounting pad

(Top view)

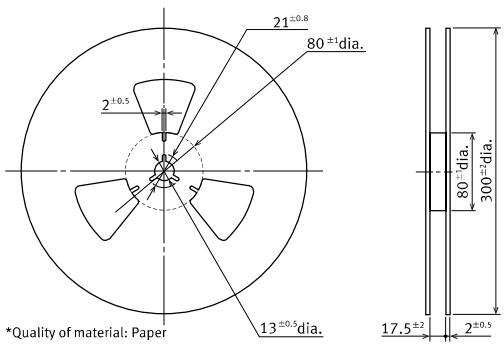


Tape dimensions (tape reel)

Tape dimensions (Unit: mm)



Dimensions of paper tape reel (Unit: mm)



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