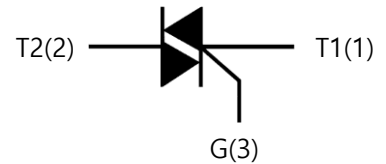
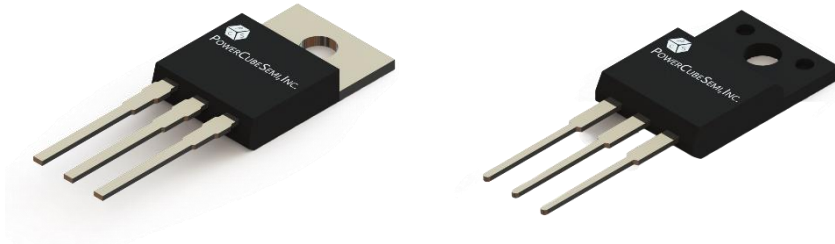


# JST20 Series

600/800/1200V-Level 20A TRIACs

## Description

With high ability to withstand the shock loading of large current, JST20 series TRIACs provide high dv/dt rate with strong resistance to electromagnetic interference. With high commutation performances, 3 quadrants products especially recommended for use on inductive load. From all three terminals to external heatsink, JST20A provides a rated insulation voltage of 2,500 VRMS, and JST20F provides a rated insulation voltage of 2,000 VRMS, complying with UL standards.



PKG type : TO-220A, TO-220B, TO-220C, TO-220F, TO-3P



## Absolute Maximum Ratings

Symbol	Parameter	Value	Unit	
$V_{DRM}$	Repetitive Peak Off-State Voltage ( $T_J=25^{\circ}C$ )	600/800/1200	V	
$V_{RRM}$	Repetitive Peak Reverse Voltage ( $T_J=25^{\circ}C$ )	600/800/1200	A	
$I_{T(RMS)}$	RMS On-State Current	TO-220A ( $T_C=70^{\circ}C$ )	20	A
		TO-220B / TO-220C ( $T_C=90^{\circ}C$ )		
		TO-220F ( $T_C=65^{\circ}C$ )		
		TO-3P ( $T_C=105^{\circ}C$ )		
$I_{TSM}$	Non-Repetitive Surge Peak On-State Current (full cycle, $f=50Hz$ )	200	A	
$I^2t$	$I^2t$ Value for Fusing ( $t_p=10ms$ )	200	$A^2s$	
dl/dt	Critical Rate of Rise of On-State Current ( $I_G=2 \times I_{GT}$ )	100	$A/\mu s$	
$T_J$	Operating Junction Temperature Range	-40 to 125	$^{\circ}C$	
$T_{stg}$	Storage Junction Temperature Range	-40 to 150	$^{\circ}C$	
$I_{GM}$	Peak Gate Current	4	A	
$P_{G(AV)}$	Average Gate Power Dissipation	1	W	
$P_{GM}$	Peak Gate Power	10	W	

## Electrical Characteristics $T_J=25^\circ\text{C}$ unless otherwise specified

### 3 Quadrants

Symbol	Test Condition	Quadrant		Numerical		Unit
				BW	CW	
$I_{GT}$	$V_D=12\text{V}, R_L=33\Omega$	I · II · III	MAX	50	35	mA
$V_{GT}$		I · II · III	MAX	1.3		V
$V_{GD}$	$V_D=V_{DRM}, T_J=125^\circ\text{C}, R_L=3.3\text{k}\Omega$	I · II · III	MIN	0.2		V
$I_L$	$I_G=1.2I_{GT}$	I · III	MAX	70	60	mA
		II		90	70	
$I_H$	$I_T=100\text{mA}$		MAX	60	50	mA
dV/dt	$V_D=2/3V_{DRM}$ Gate Open $T_J=125^\circ\text{C}$		MIN	1000	500	V/ $\mu\text{s}$

### 4 Quadrants

Symbol	Test Condition	Quadrant		Numerical	Unit
$I_{GT}$	$V_D=12\text{V}, R_L=33\Omega$	I · II · III	MAX	50	mA
		IV		70	
$V_{GT}$		ALL	MAX	1.3	V
$V_{GD}$	$V_D=V_{DRM}, T_J=125^\circ\text{C}, R_L=3.3\text{k}\Omega$	ALL	MIN	0.2	V
$I_L$	$I_G=1.2I_{GT}$	I · III · IV	MAX	70	mA
		II		90	
$I_H$	$I_T=100\text{mA}$		MAX	60	mA
dV/dt	$V_D=2/3V_{DRM}$ Gate Open $T_J=125^\circ\text{C}$		MIN	500	V/ $\mu\text{s}$

## Static Characteristics & Thermal Resistances

Symbol	Parameter		Value (MAX)	Unit
$V_{TM}$	$I_{TM}=28\text{A}, t_p=380\mu\text{s}$	$T_J=25^\circ\text{C}$	1.5	V
$V_{TO}$	Threshold Voltage	$T_J=125^\circ\text{C}$	0.87	V
$R_d$	Dynamic Resistance	$T_J=125^\circ\text{C}$	23	m $\Omega$
$I_{DRM}$	$V_D=V_{DRM}, V_R=V_{RRM}$	$T_J=25^\circ\text{C}$	5	$\mu\text{A}$
$I_{RRM}$		$T_J=125^\circ\text{C}$	2.5	mA

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	TO-220A	2.4
		TO-220B / TO-220C	1.1
		TO-220F	2.1
		TO-3P	0.7



## Package Marking and Ordering Information

Device Marking	$V_{DRM} / V_{RRM}$ [V]	IGT(Ma)	Package	Packing Method	Quantity
JST20A-600/800/1200BW	600/800/1200	50	TO-220A	Tube	50
JST20A-600/800/1200CW		35			
JST20B-600/800/1200BW		50	TO-220B		
JST20B-600/800/1200CW		35			
JST20C-600/800/1200BW		50	TO-220C		
JST20C-600/800/1200CW		35			
JST20F-600/800/1200BW		50	TO-220F		
JST20F-600/800/1200CW		35			
JST20Z-600/800/1200BW		50	TO-3P		
JST20Z-600/800/1200CW		35			

Device Marking	$V_{DRM} / V_{RRM}$ [V]	IGT(Ma)		Package	Packing Method	Quantity
		I · II · III	IV			
JST20A-600/800/1200B	600/800/1200	50	70	TO-220A	Tube	50
JST20B-600/800/1200B				TO-220B		
JST20C-600/800/1200B				TO-220C		
JST20F-600/800/1200B				TO-220F		
JST20Z-600/800/1200B				TO-220F		
				TO-220F		

# Typical Characteristics

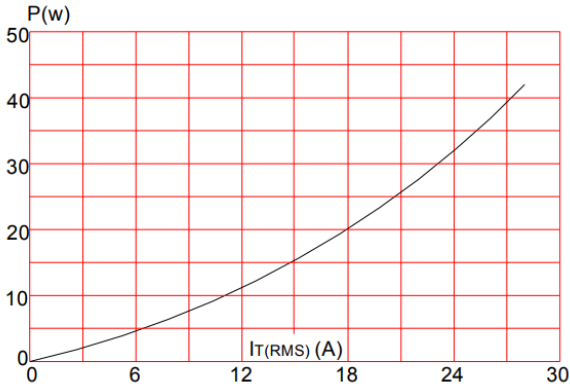


Figure 1. Maximum Power Dissipation vs. RMS On-State Current

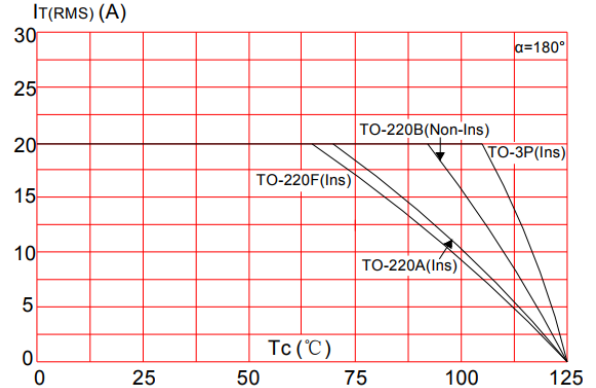


Figure 2. RMS On-State Current vs. Case Temperature

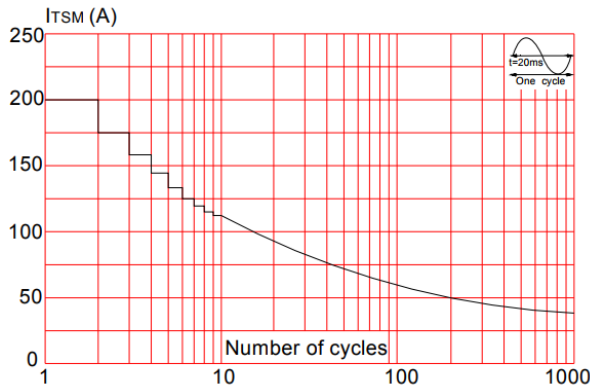


Figure 3. Surge Peak On-State Current vs. Number of Cycles

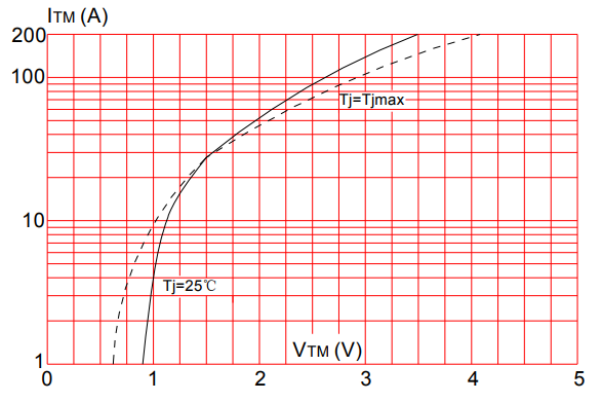


Figure 4. On-State Characteristics (Maximum Values)

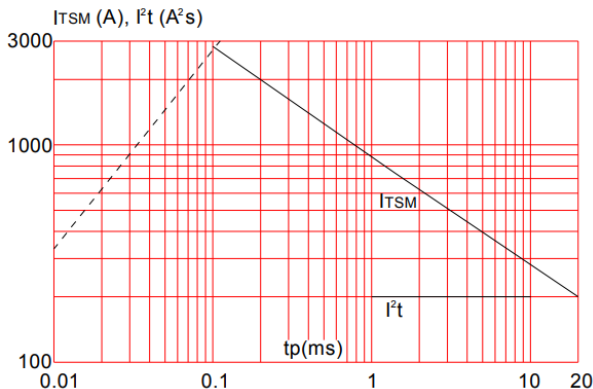


Figure 5. Non-Repetitive Surge Peak On-State Current for a Sinusoidal Pulse with width  $t_p < 20\text{ms}$  and Corresponding Value of  $I^2T$  ( $di/dt < 50\text{A}/\mu\text{s}$ )

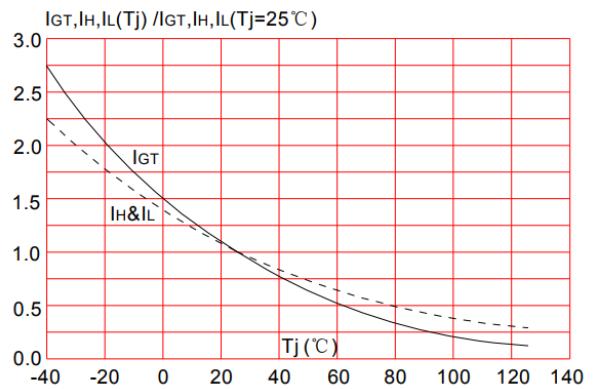
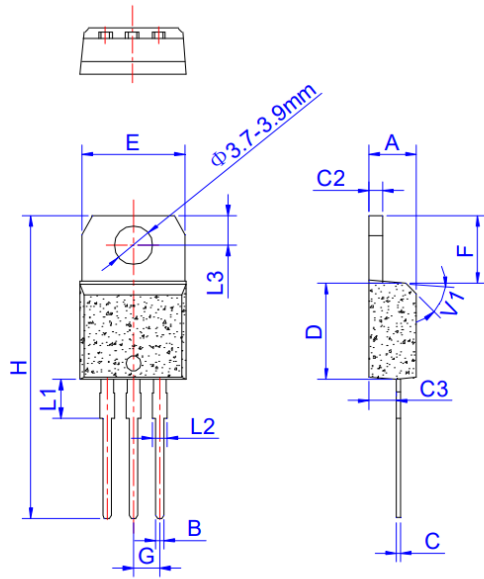


Figure 6. Relative Variations of Gate Trigger Current, Holding Current and Latching Current vs. Junction Temperature

### Package Outline

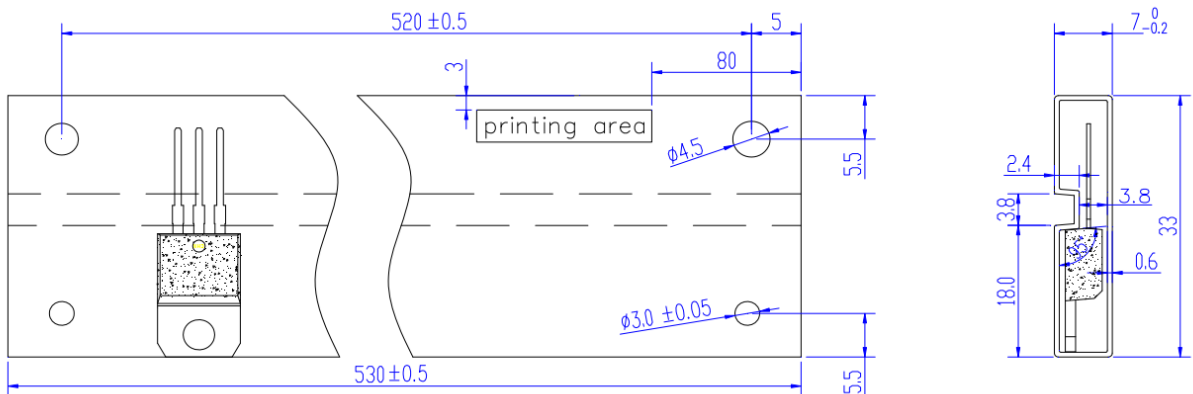
[ TO-220A ]

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
A	4.40		4.60	
B	0.61		0.88	
C	0.46		0.70	
C2	1.21		1.32	
C3	2.40		2.72	
D	8.60		9.70	
E	9.80		10.4	
F	6.25		6.85	
G	2.40		2.70	
H	28.0		29.8	
L1	3.45		4.5	
L2	1.14		1.70	
L3	2.65		2.95	
V1		45°		

### Delivery Mode

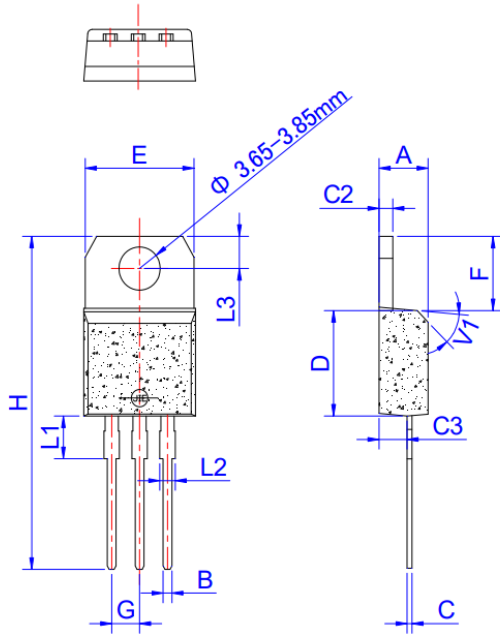


Package	Outline	Tube	Inner Box	Per Carton
TO-220A	TUBE	50	1,000	5,000

### Package Outline

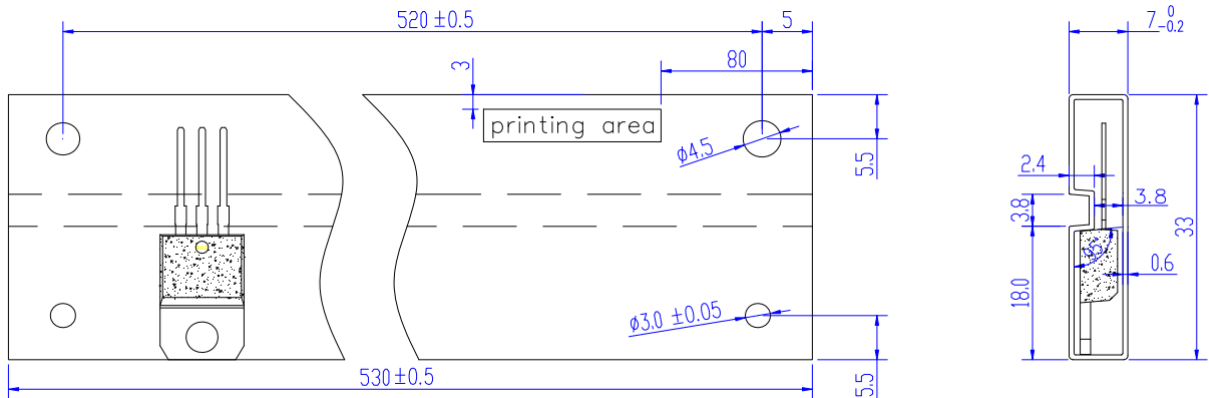
[ TO-220B ]

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
A	4.40		4.60	
B	0.61		0.88	
C	0.46		0.70	
C2	1.21		1.32	
C3	2.40		2.72	
D	8.60		9.70	
E	9.60		10.40	
F	6.20		6.60	
G	2.40		2.70	
H	28.0		29.8	
L1		3.75		
L2	1.14		1.70	
L3	2.65		2.95	
V1		45°		

### Delivery Mode

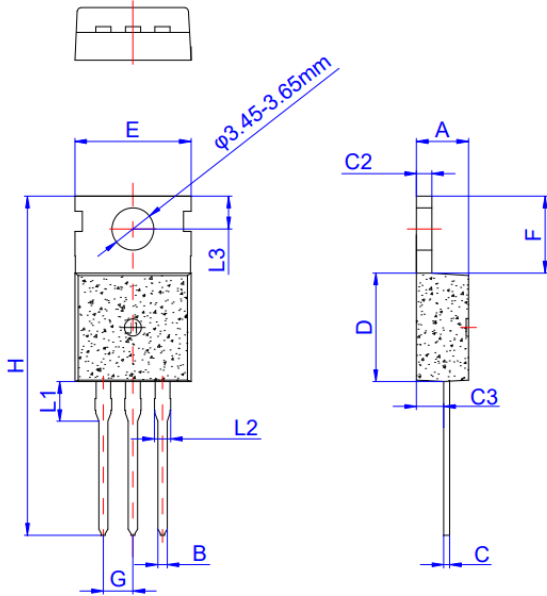


Package	Outline	Tube	Inner Box	Per Carton
TO-220B	TUBE	50	1,000	5,000

### Package Outline

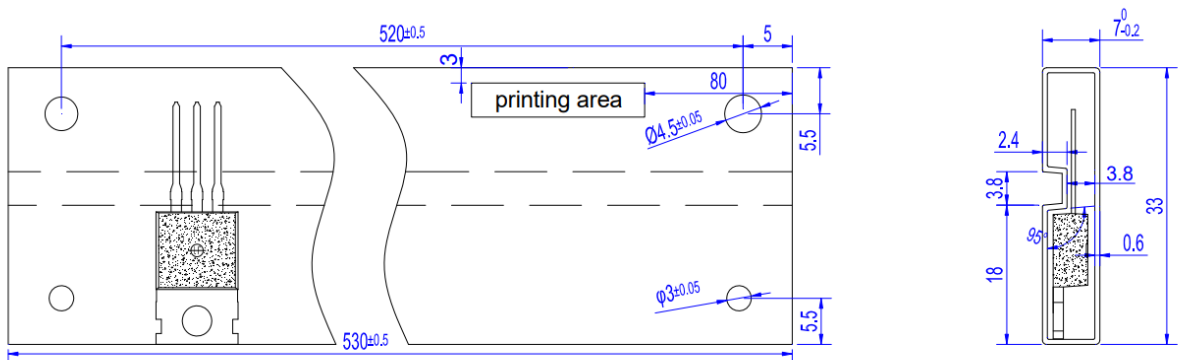
[ TO-220C ]

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
A	4.40		4.60	
B	0.70		0.90	
C	0.45		0.60	
C2	1.25		1.35	
C3	2.20		2.60	
D	8.90		9.90	
E	9.90		10.3	
F	6.30		6.90	
G	2.40		2.70	
H	28.0		29.8	
L1	2.70		3.30	
L2	1.14		1.70	
L3	2.65		2.95	

### Delivery Mode

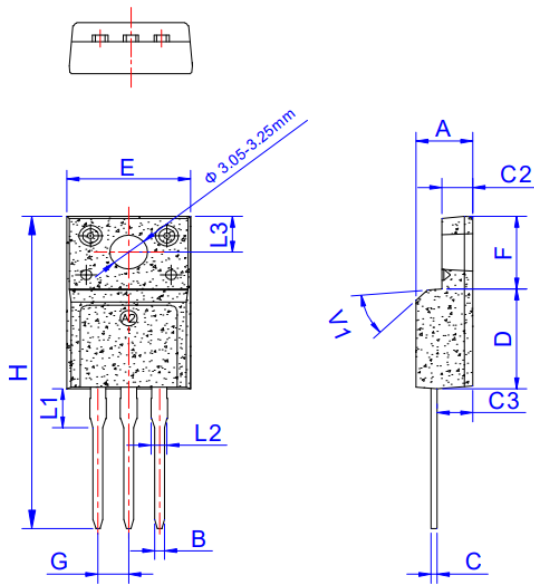


Package	Outline	Tube	Inner Box	Per Carton
TO-220C	TUBE	50	1,000	5,000

## Package Outline

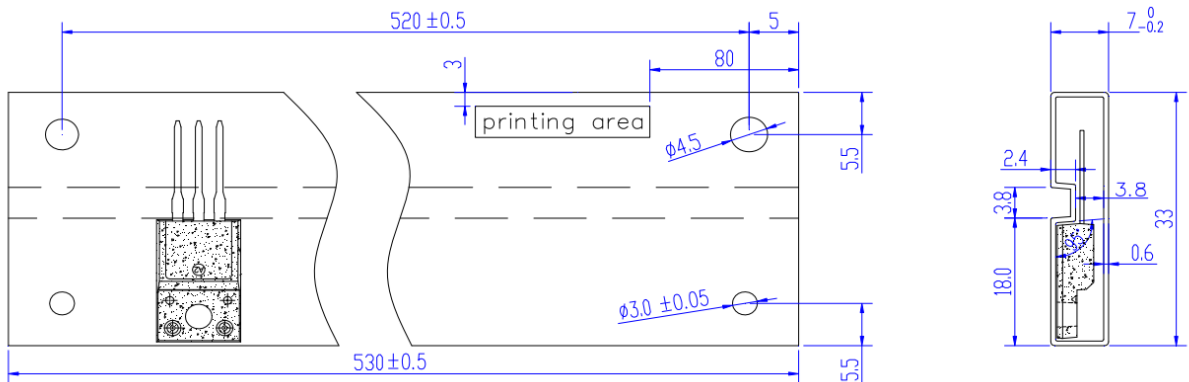
[ TO-220F ]

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
A	4.50		4.90	
B	0.74	0.80	0.83	
C	0.47		0.65	
C2	2.45		2.75	
C3	2.60		3.00	
D	8.8		9.30	
E	9.80		10.4	
F	6.40		6.80	
G	2.40		2.70	
H	28.0		29.8	
L1	3.20		3.80	
L2	1.14		1.70	
L3	3.20		3.60	
V1		45°		

## Delivery Mode



Package	Outline	Tube	Inner Box	Per Carton
TO-220F	TUBE	50	1,000	5,000

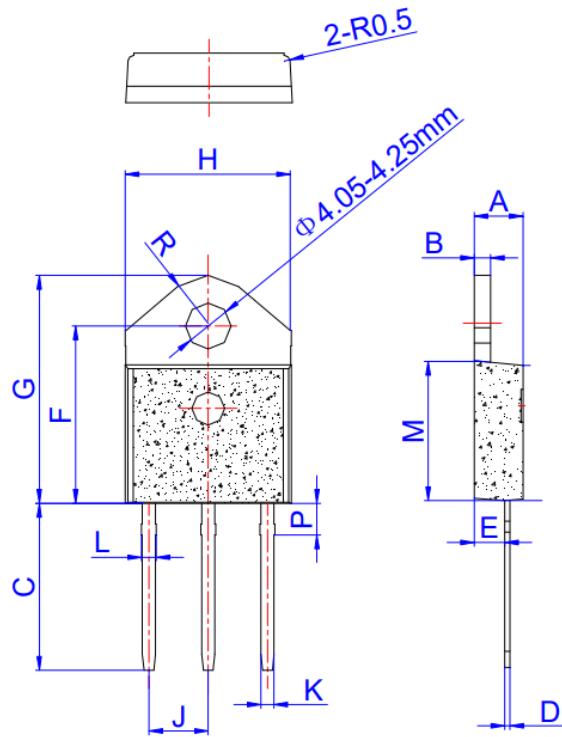




**Package Outline**

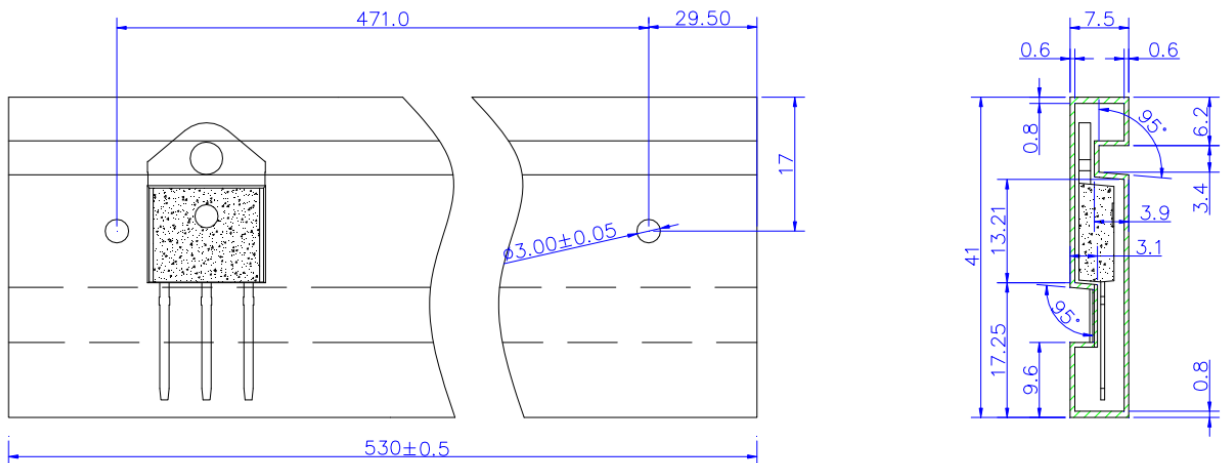
[ TO-3P ]

Unit : mm



SYMBOL	DIMENSIONS			NOTES
	MIN	NOM	MAX	
A	4.40		4.60	
B	1.45		1.55	
C	14.35		15.60	
D	0.50		0.70	
E	2.70		2.90	
F	15.80		16.50	
G	20.40		21.10	
H	15.10		15.50	
J	5.40		5.65	
K	1.10		1.40	
L	1.25		1.45	
M	12.37		12.77	
P	2.80		3.00	
R		4.35		

**Delivery Mode**



Package	Outline	Tube	Inner Box	Per Carton
TO-3P	TUBE	30	450	2,250