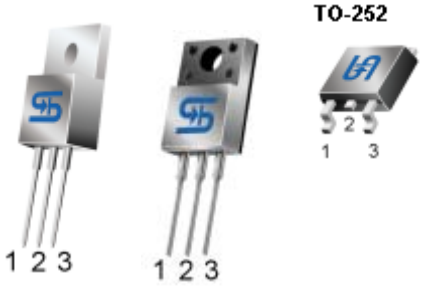
TS13005

High Voltage NPN Transistor

TO-220 ITO-220 TO-252



Pin assignment:
1. Base
2. Collector
3. Emitter

BV_{CEO} = 400V
BV_{CBO} = 700V
Ic = 4A
$V_{CE\ (SAT)}$, = 1V @ Ic / Ib = 4A / 1A

Features

- ✧ High voltage
- ✧ High speed switching

Structure

- ✧ Silicon triple diffused type.
- ✧ NPN silicon transistor

Ordering Information

Part No.	Packing	Package
TS13005CZ	Tube	TO-220
TS13005CI		ITO-220
TS13005CP	T&R	TO-252

Absolute Maximum Rating (Ta = 25 °C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Collector-Base Voltage		V_{CBO}	700V	V
Collector-Emitter Voltage		V_{CEO}	400V	V
Emitter-Base Voltage		V_{EBO}	9	V
Collector Current	DC	I_C	4	A
	Pulse		8	
Collector Power Dissipation	TO-220	P_D	2	W
	ITO-220		1.5	
	TO-252		1.3	
Operating Junction Temperature		T_J	+150	°C
Operating Junction and Storage Temperature Range		T_{STG}	- 65 to +150	°C

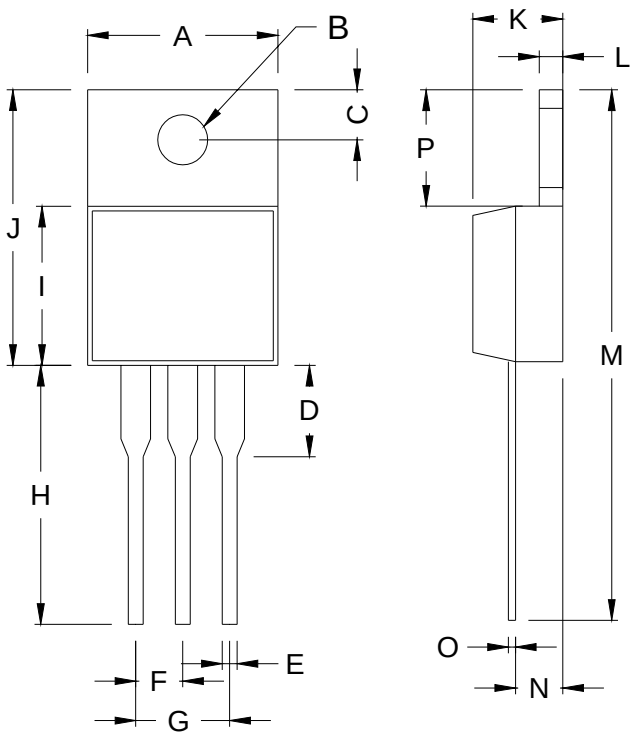
Note: 1. Single pulse, Pw = 300uS, Duty <= 2%

Electrical Characteristics (Ta = 25 °C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Collector-Base Voltage	I_C = 10mA, I_B = 0	BV_{CBO}	700			V
Collector-Emitter Breakdown Voltage	I_C = 10mA, I_E = 0	BV_{CEO}	400			V
Emitter-Base Breakdown Voltage	I_E = 1mA, I_C = 0	BV_{EBO}	9			V
Collector Cutoff Current	V_{CB} = 700V, I_E = 0	I_{CBO}			10	mA
Emitter Cutoff Current	V_{EB} = 9V, I_C = 0	I_{EBO}			1	mA
Collector-Emitter Saturation Voltage	I_C / I_B = 4A / 1A I_C / I_B = 1A / 0.2A	$V_{CE(SAT)1}$ $V_{CE(SAT)2}$			1 0.5	V
DC Current Gain	V_{CE} = 5V, I_C = 2A	h_{FE}	8		40	
Frequency	V_{CE} = 10V, I_C = 0.5A	f_T	4			MHz
Output Capacitance	V_{CB} = 10V, f = 0.1MHz	Cob		65		pF
Turn On Time	V_{CC} = 125V, I_C = 2A,	t_{ON}		0.8		uS
Storage Time	I_{B1} = 0.4A, I_{B2} = - 0.4A,	t_{STG}			4	uS
Fall Time	R_L = 62.5ohm	t_f			0.9	uS

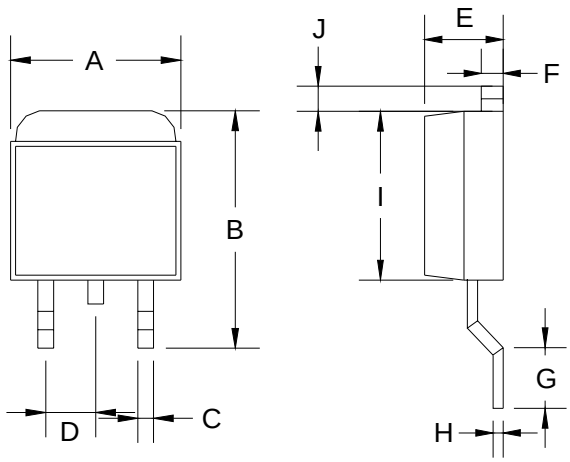
Note : pulse test: pulse width <=300uS, duty cycle <=2%

TO-220 Mechanical Drawing



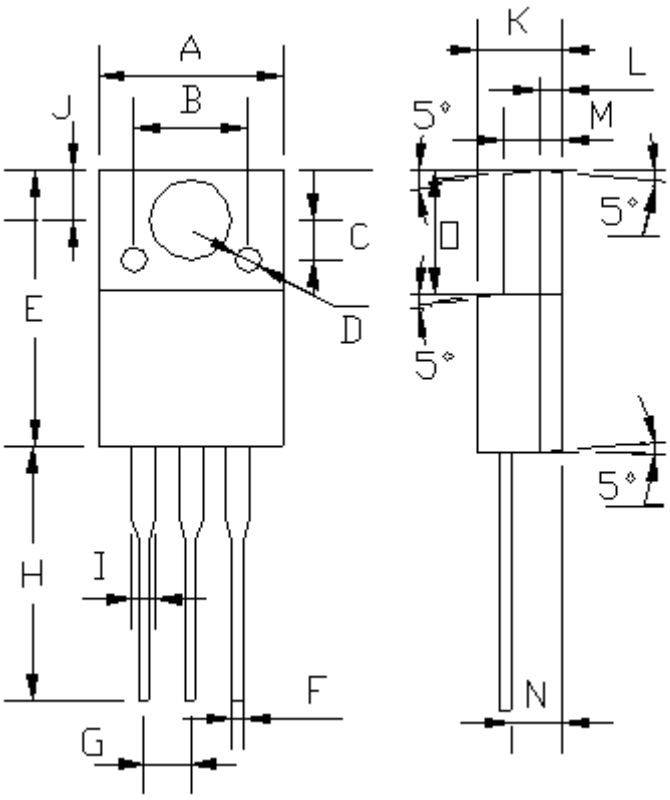
TO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.000	10.500	0.394	0.413
B	3.240	4.440	0.128	0.175
C	2.440	2.940	0.096	0.116
D	-	6.350	-	0.250
E	0.381	1.106	0.015	0.040
F	2.345	2.715	0.092	0.058
G	4.690	5.430	0.092	0.107
H	12.700	14.732	0.500	0.581
I	8.382	9.017	0.330	0.355
J	14.224	16.510	0.560	0.650
K	3.556	4.826	0.140	0.190
L	0.508	1.397	0.020	0.055
M	27.700	29.620	1.060	1.230
N	2.032	2.921	0.080	0.115
O	0.255	0.610	0.010	0.024
P	5.842	6.858	0.230	0.270

TO-252 Mechanical Drawing



TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.570	6.840	0.259	0.269
B	9.250	10.400	0.364	0.409
C	0.550	0.700	0.022	0.028
D	2.560	2.670	0.101	0.105
E	2.300	2.390	0.090	0.094
F	0.490	0.570	0.019	0.022
G	1.460	1.580	0.057	0.062
H	0.520	0.570	0.020	0.022
I	5.340	5.550	0.210	0.219
J	1.460	1.640	0.057	0.065

ITO-220 Mechanical Drawing



ITO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.04	10.07	0.395	0.396
B	6.20 (typ.)		0.244 (typ.)	
C	2.20 (typ.)		0.087 (typ.)	
D	∮ 1.40 (typ.)		∮ 0.055 (typ.)	
E	15.0	15.20	0.591	0.598
F	0.52	0.54	0.020	0.021
G	2.35	2.73	0.093	0.107
H	13.50	13.55	0.531	0.533
I	1.11	1.49	0.044	0.058
J	2.60	2.80	0.102	0.110
K	4.49	4.50	0.176	0.177
L	1.15 (typ.)		0.045 (typ.)	
M	3.03	3.05	0.119	0.120
N	2.60	2.80	0.102	0.110
O	6.55	6.65	0.258	0.262