

**NPN Epitaxial Planar Transistor**

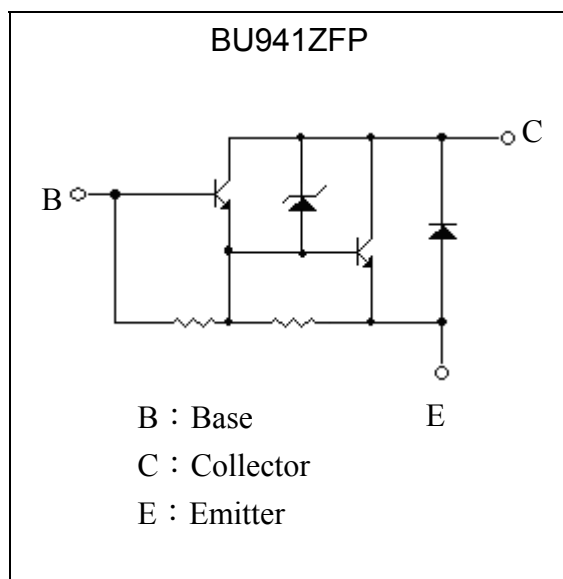
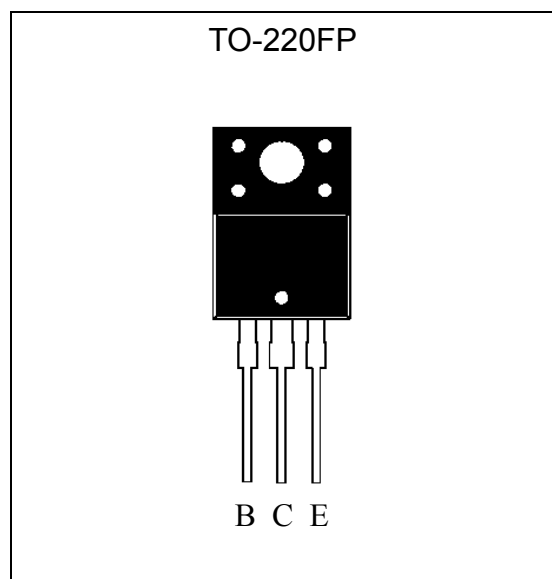
# BU941ZFP

**Features**

- High  $BV_{CEO}$
- Low  $V_{CE(SAT)}$
- High current capability
- Built-in clamping zener
- Pb-free package

**Applications**

- High ruggedness electronic ignitions

**Equivalent Circuit****Outline**

**Absolute Maximum Ratings** (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V <sub>CBO</sub>	350	V
Collector-Emitter Voltage	V <sub>CEO</sub>	350	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current	I <sub>C(DC)</sub>	15	A
	I <sub>C(Pulse)</sub>	30 *1	
Base Current	I <sub>B(DC)</sub>	1	A
	I <sub>B(Pulse)</sub>	5 *1	
Power Dissipation	Pd(T <sub>A</sub> =25°C)	2	W
	Pd(T <sub>C</sub> =25°C)	55	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	75	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	2.7	°C/W
Junction Temperature	T <sub>j</sub>	175	°C
Storage Temperature	T <sub>stg</sub>	-65~+175	°C

Note : \*1. Single Pulse Pw=10ms

**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	350	-	-	V	I <sub>C</sub> =1mA, I <sub>E</sub> =0
BV <sub>CEO</sub>	350	-	-	V	I <sub>C</sub> =100mA, I <sub>B</sub> =0
I <sub>CEO</sub>	-	-	100	μA	V <sub>CE</sub> =300V, I <sub>E</sub> =0
I <sub>CBO</sub>	-	-	100	μA	V <sub>CB</sub> =300V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	20	mA	V <sub>EB</sub> =5V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub> 1	-	-	1.8	V	I <sub>C</sub> =8A, I <sub>B</sub> =100mA
*V <sub>CE(sat)</sub> 2	-	-	1.8	V	I <sub>C</sub> =10A, I <sub>B</sub> =250mA
*V <sub>BE(sat)</sub> 1	-	-	2.2	V	I <sub>C</sub> =8A, I <sub>B</sub> =100mA
*V <sub>BE(sat)</sub> 2	-	-	2.5	V	I <sub>C</sub> =10A, I <sub>B</sub> =250mA
*V <sub>FEC</sub>	-	-	2.5	V	I <sub>C</sub> =10A
*h <sub>FE</sub> 1	300	-	-	-	V <sub>CE</sub> =10V, I <sub>C</sub> =5A
*h <sub>FE</sub> 2	100	-	-	-	V <sub>CE</sub> =10V, I <sub>C</sub> =8A

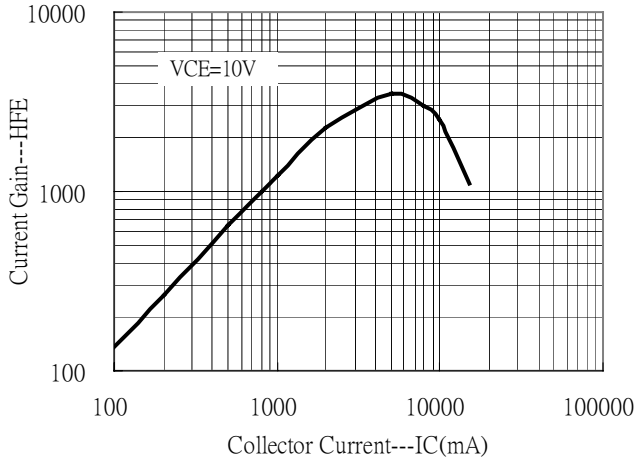
\*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

**Ordering Information**

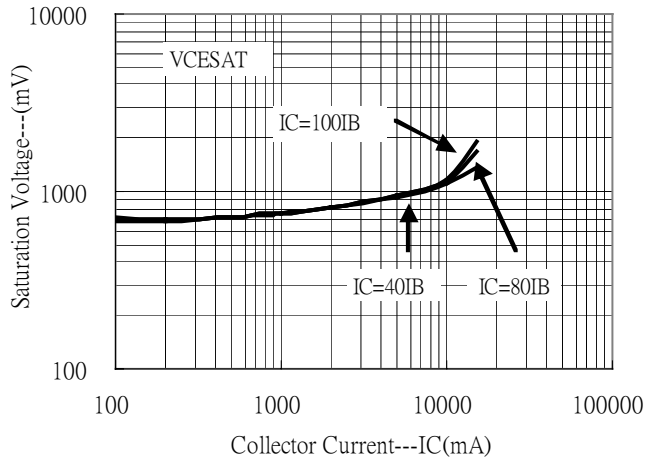
Device	Package	Shipping	Marking
BU941ZFP	TO-220FP (Pb-free)	50 pcs / tube, 20 tubes/ box , 4 boxes/carton	BU941Z

**Characteristic Curves**

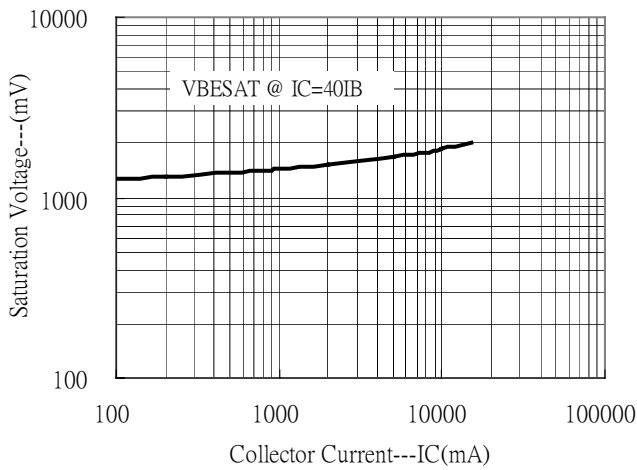
Current Gain vs Collector Current



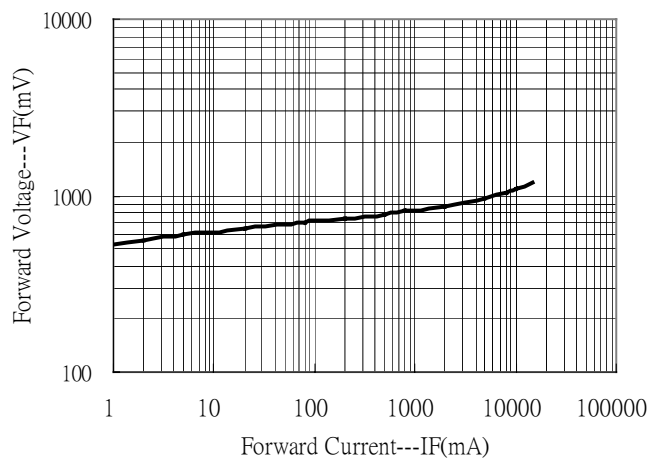
Saturation Voltage vs Collector Current



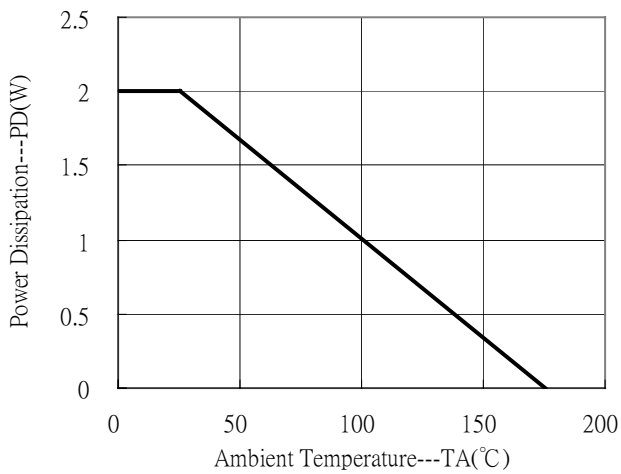
Saturation Voltage vs Collector Current



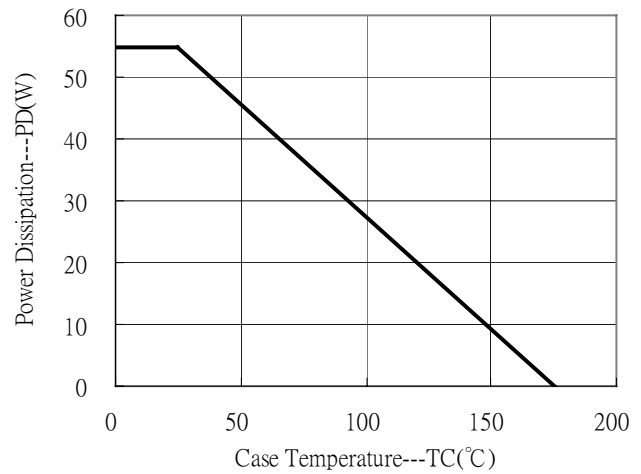
Built-in Diode Forward Characteristics



Power Derating Curve



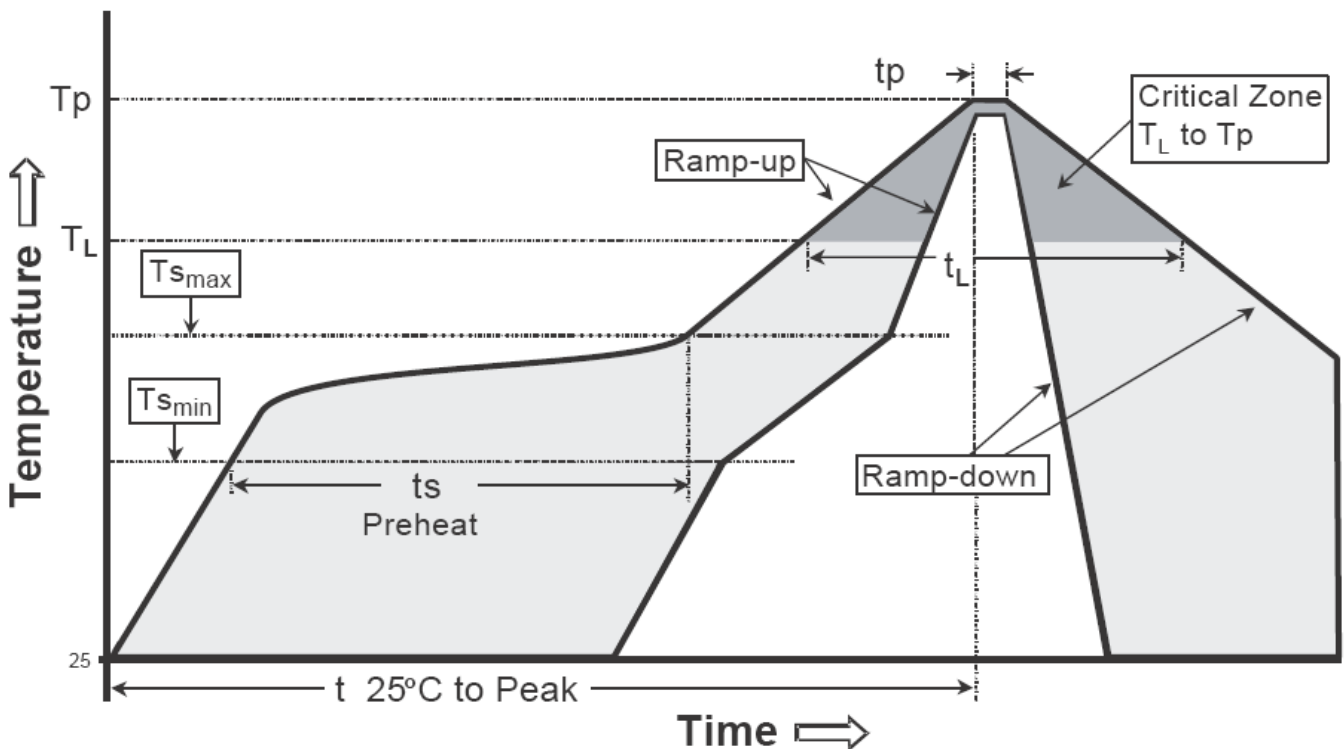
Power Derating Curve



**Recommended wave soldering condition**

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

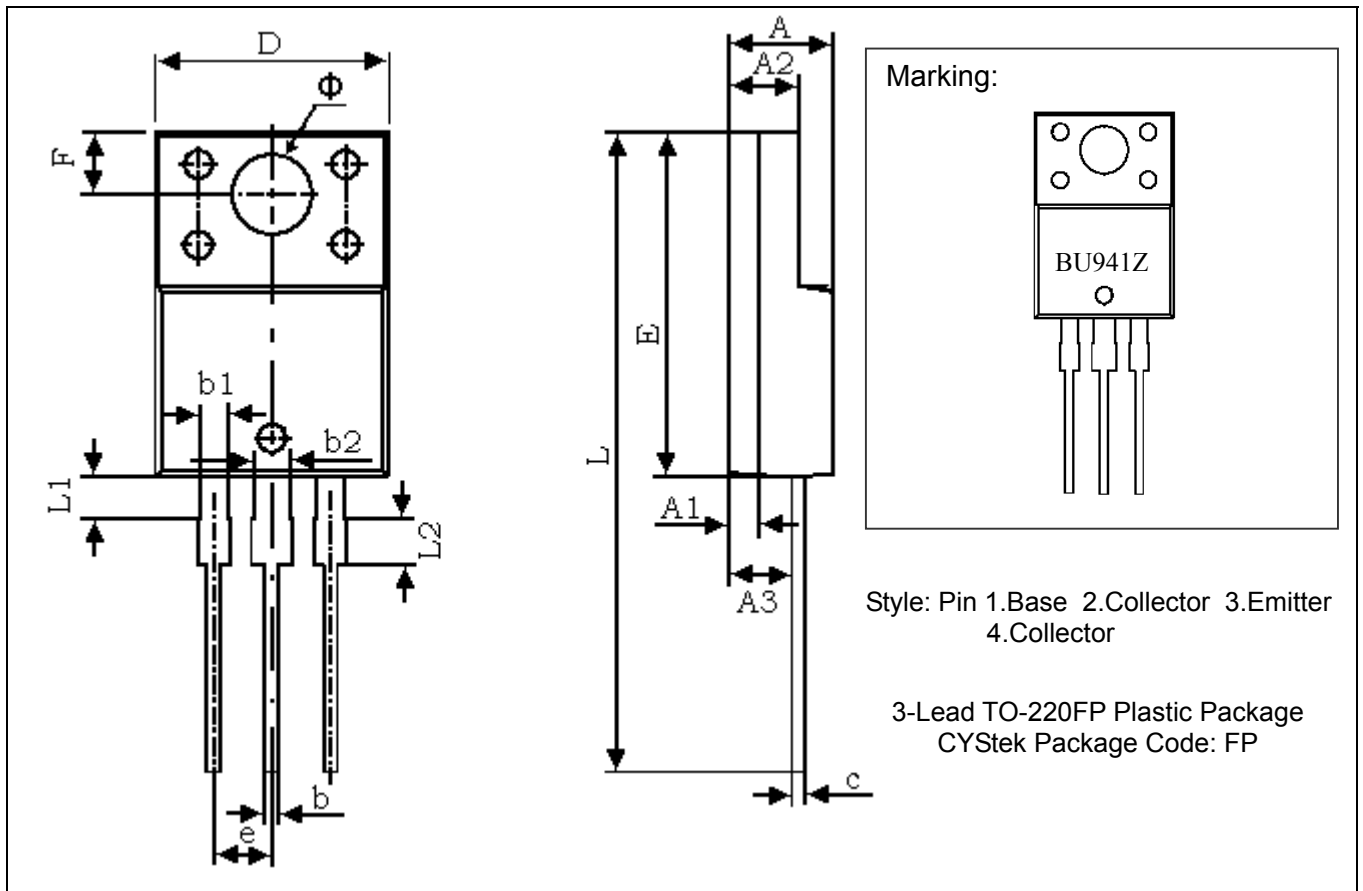
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)	183°C	217°C
- Time (tL)	60-150 seconds	60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

**TO-220FP Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.169	0.185	4.300	4.700	D	0.392	0.408	9.960	10.360
A1	0.051 REF		1.300 REF		E	0.583	0.598	14.800	15.200
A2	0.110	0.126	2.800	3.200	e	0.100 TYP		2.540 TYP	
A3	0.098	0.114	2.500	2.900	F	0.106 REF		2.700 REF	
b	0.020	0.030	0.500	0.750	Φ	0.138 REF		3.500 REF	
b1	0.043	0.053	1.100	1.350	L	1.102	1.118	28.000	28.400
b2	0.059	0.069	1.500	1.750	L1	0.067	0.075	1.700	1.900
c	0.020	0.030	0.500	0.750	L2	0.075	0.083	1.900	2.100

**Notes:** 1.Controlling dimension: millimeters.  
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: KFC ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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