

**NPN Epitaxial Planar Transistor**

# BU941ZP3

$BV_{CEO}$	350V
$I_C$	15A
$V_{CESAT(MAX)}$	2V @12A

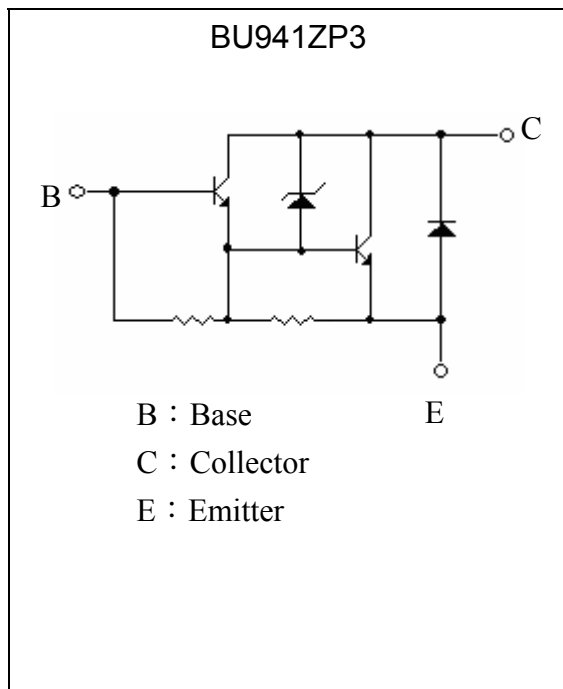
**Features**

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

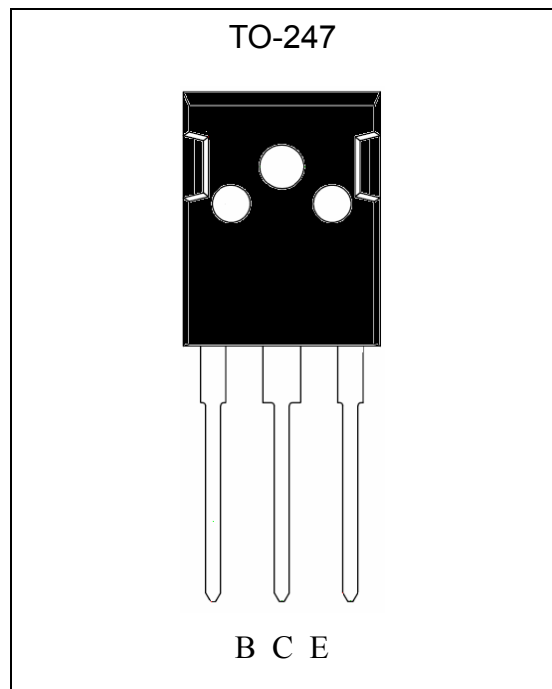
**Applications**

- 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>C</sub> =25°C)	155	W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	0.97	°C/W
Junction Temperature	T <sub>j</sub>	175	°C
Storage Temperature	T <sub>stg</sub>	-65~+175	°C

Note : \*1. Single Pulse tp<5ms

**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>CE(sat)</sub> 3	-	-	2	V	I <sub>C</sub> =12A, I <sub>B</sub> =300mA
*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>BE(sat)</sub> 3	-	-	2.7	V	I <sub>C</sub> =12A, I <sub>B</sub> =300mA
*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

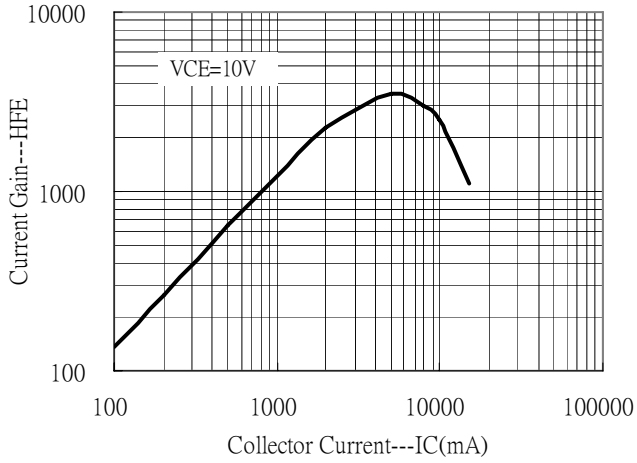
\*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

**Ordering Information**

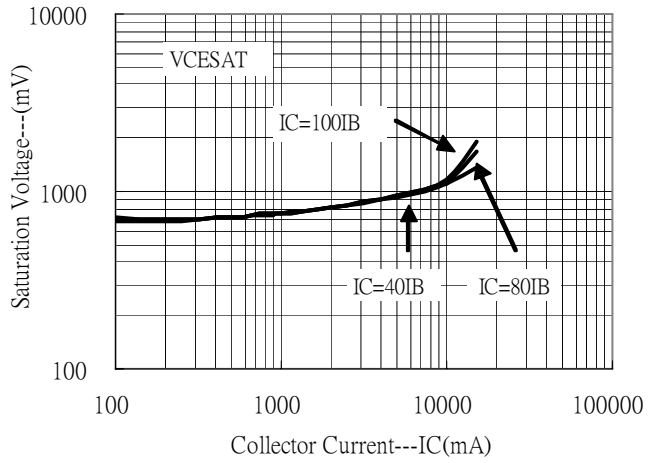
Device	Package	Shipping	Marking
BU941ZP3	TO-247 (Pb-free lead plating package)	30 pcs / tube, 10 tubes/ box , 10 boxes/carton	BU941Z

**Characteristic Curves**

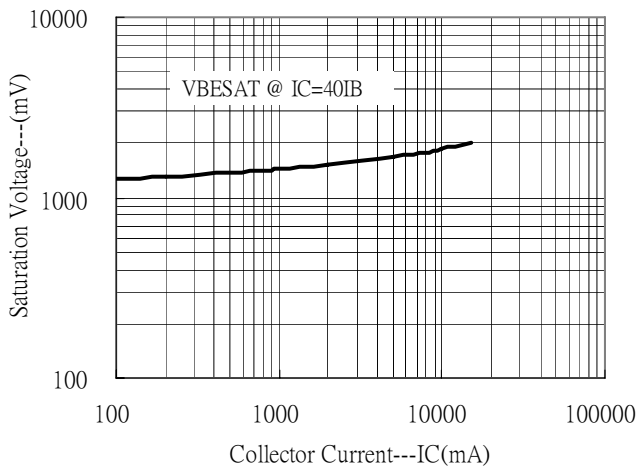
Current Gain vs Collector Current



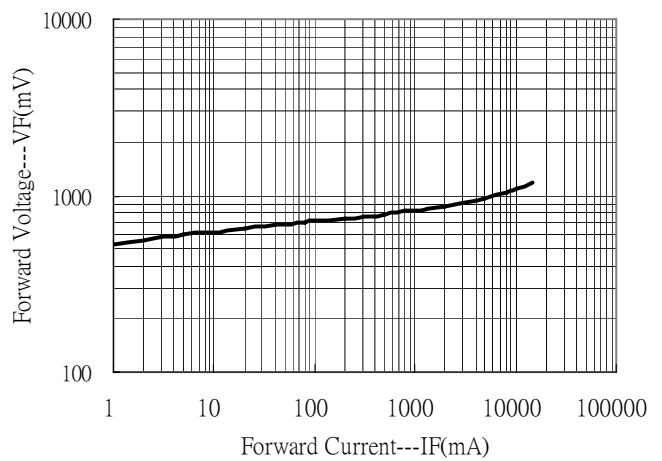
Saturation Voltage vs Collector Current



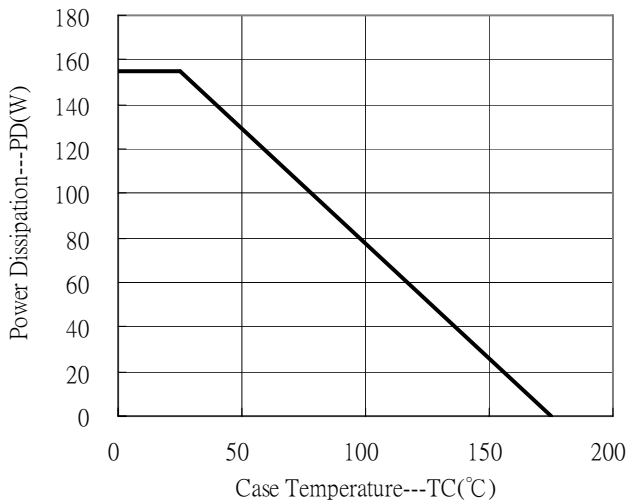
Saturation Voltage vs Collector Current



Built-in Diode Forward Characteristics



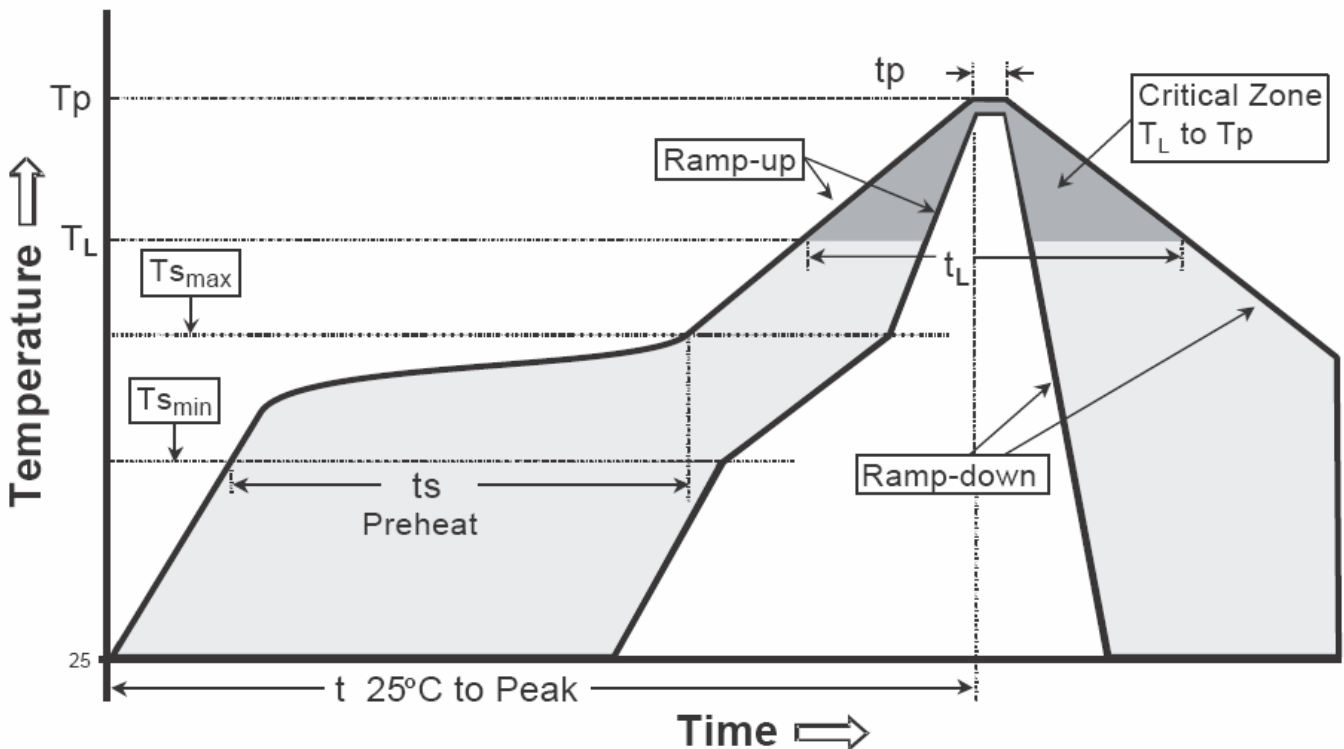
Power Derating Curve



**Recommended wave soldering condition**

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

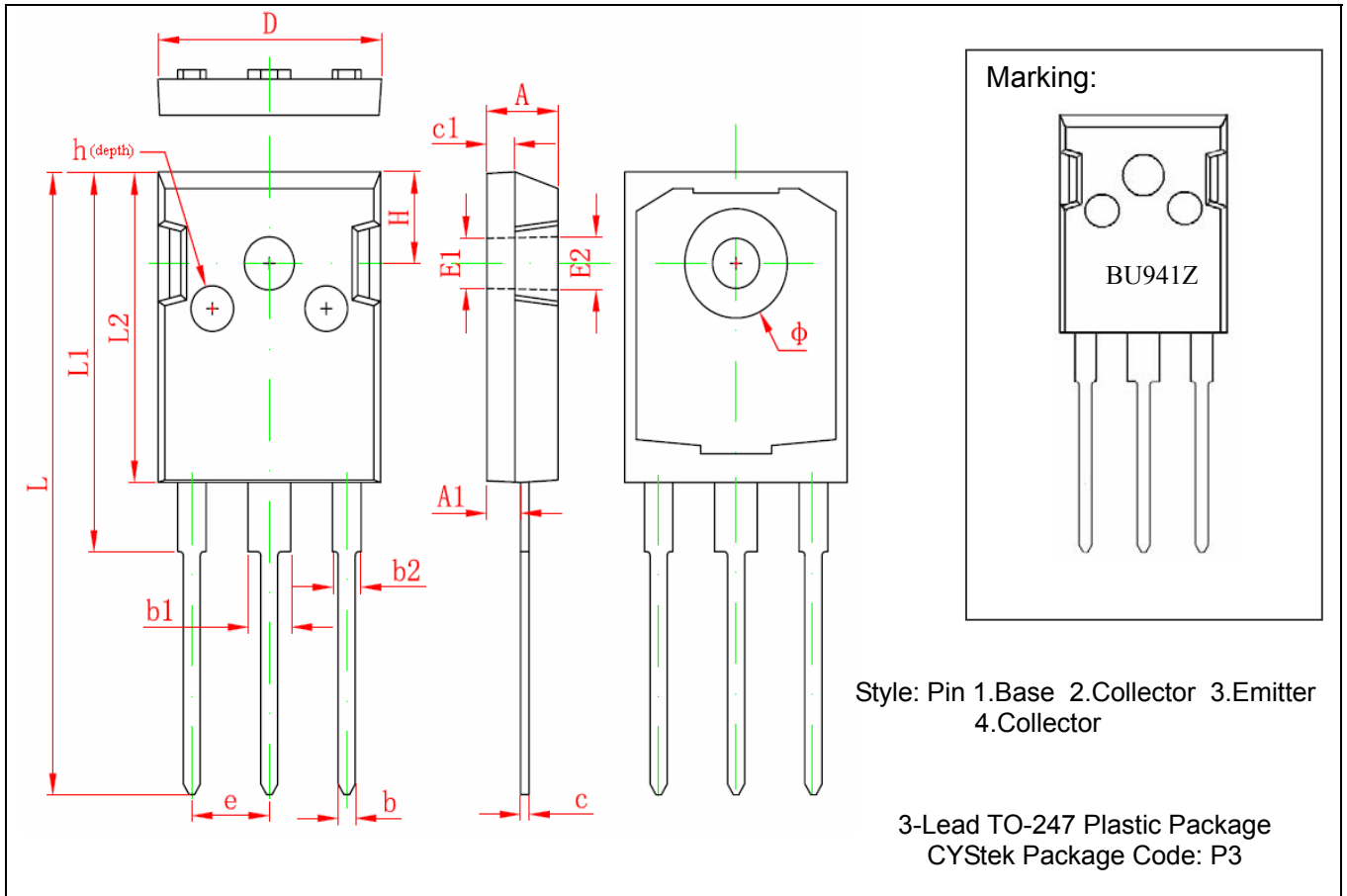
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	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-247 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.191	0.200	4.850	5.150	E2	0.142 REF		3.600	REF
A1	0.087	0.102	2.200	2.600	L	1.610	1.626	40.900	41.300
b	0.039	0.055	1.000	1.400	L1	0.976	0.988	24.800	25.100
b1	0.110	0.126	2.800	3.200	L2	0.799	0.811	20.300	20.600
b2	0.071	0.087	1.800	2.200	Φ	0.280	0.287	7.100	7.300
c	0.020	0.028	0.500	0.700	e	0.215 REF		5.450	REF
c1	0.075	0.083	1.900	2.100	H	0.235 REF		5.980	REF
D	0.608	0.620	15.450	15.750	h	0.000	0.012	0.000	0.300
E1	0.138 REF		3.500 REF						

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: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

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