NPN Epitaxial Planar Transistor

BU941ZLE3

BV_{CEO}	350V
I_C	15A
$V_{CESAT(MAX)}$	1.6V

Features

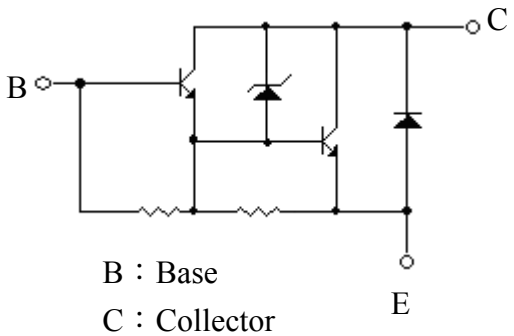
- High BV_{CEO}
- Low $V_{CE(SAT)}$
- High current capability
- Built-in clamping zener
- Pb-free lead plating package

Applications

- High ruggedness electronic ignitions

Equivalent Circuit

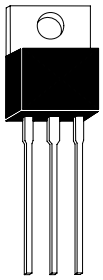
BU941ZLE3



B：Base
C：Collector
E：Emitter

Outline

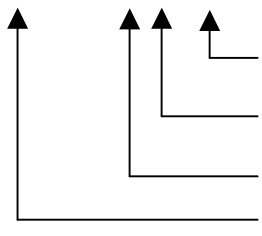
TO-220



B C E

Ordering Information

Device	Package	Shipping
BU941ZLE3-0-UB-S	TO-220 (Pb-free lead plating)	50 pcs / tube, 20 tubes/ box , 4 boxes/carton



Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, UB : 50 pcs / tube, 20 tubes/box

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	350	V
Collector-Emitter Voltage	V_{CEO}	350	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current	$I_{C(DC)}$	15	A
	$I_{C(Pulse)}$	30 *1	
Base Current	$I_{B(DC)}$	1	A
	$I_{B(Pulse)}$	5 *1	
Power Dissipation	$Pd(T_A=25℃)$	2	W
	$Pd(T_C=25℃)$	150	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	75	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1	°C/W
Junction Temperature	Tj	175	°C
Storage Temperature	Tstg	-65~+175	°C

Note : *1. Single Pulse Pw=10ms

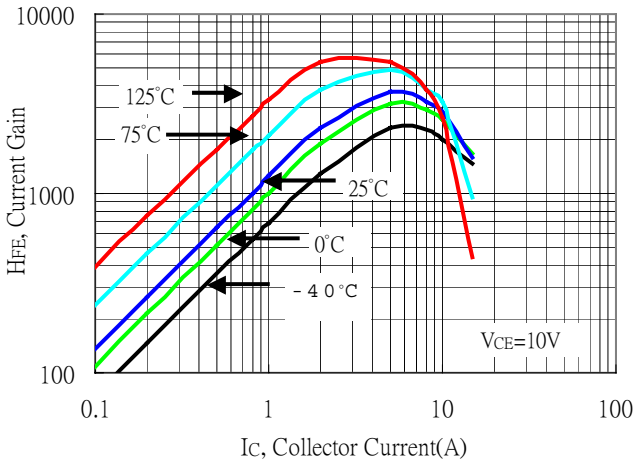
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	350	-	450	V	I_C=1mA, I_E=0
BV_{CEO}	350	-	450		I_C=100mA, I_B=0
I_{CEO}	-	-	10	μA	V_{CE}=300V, I_E=0
I_{CBO}	-	-	10		V_{CB}=300V, I_E=0
I_{EBO}	-	5.34	10	mA	V_{EB}=5V, I_C=0
*$V_{CE(sat)}$ 1	-	1.04	1.6	V	I_C=6A, I_B=10mA
*$V_{CE(sat)}$ 2	-	1.20	1.8		I_C=8.4A, I_B=15mA
*$V_{CE(sat)}$ 3	-	1.12	1.6		I_C=10A, I_B=250mA
*$V_{CE(sat)}$ 4	-	1.39	2.0		I_C=12A, I_B=50mA
*$V_{BE(sat)}$ 1	-	1.77	2.2		I_C=8A, I_B=100mA
*$V_{BE(sat)}$ 2	-	1.86	2.5		I_C=10A, I_B=250mA
*$V_{BE(sat)}$ 3	-	1.94	2.5		I_C=12A, I_B=300mA
*h_{FE} 1	1000	-	4500	-	V_{CE}=10V, I_C=5A
*h_{FE} 2	600	-	-	-	V_{CE}=10V, I_C=10A
*V_{FEC}	-	1.08	1.5	V	I_C=10A

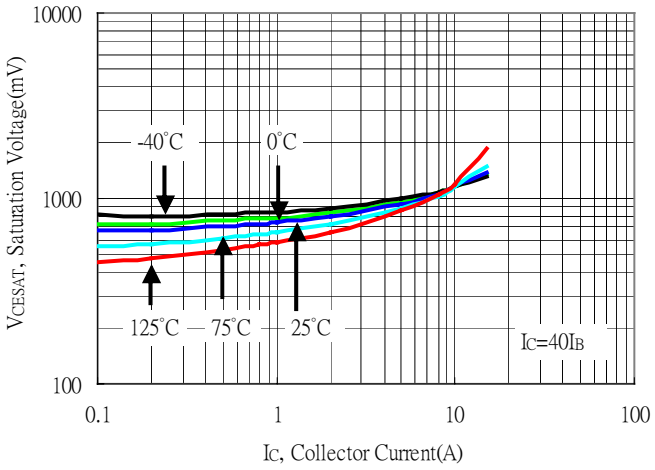
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

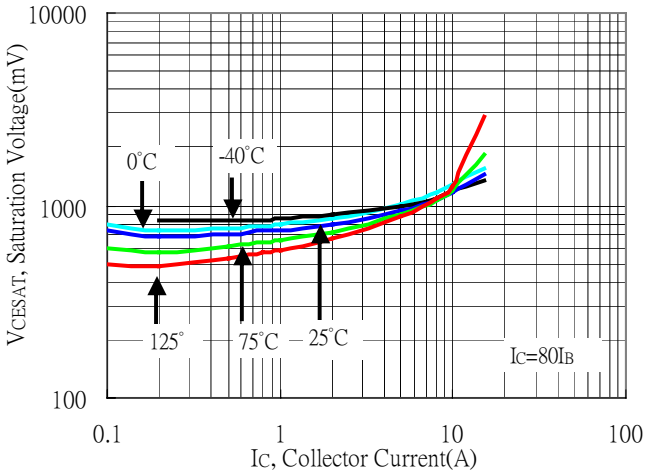
Current Gain vs Collector Current



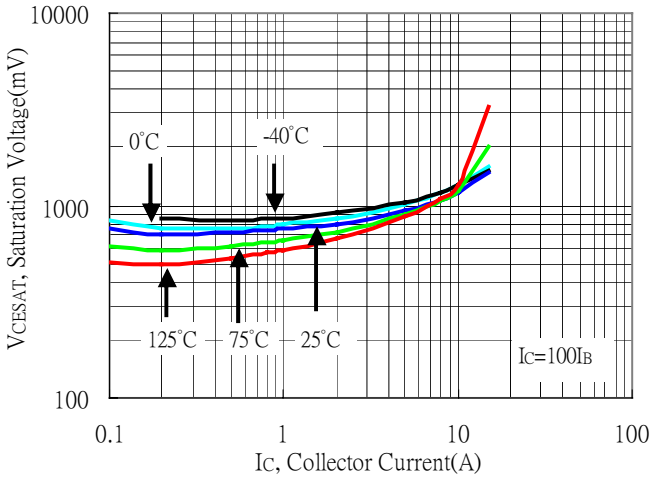
Saturation Voltage vs Collector Current



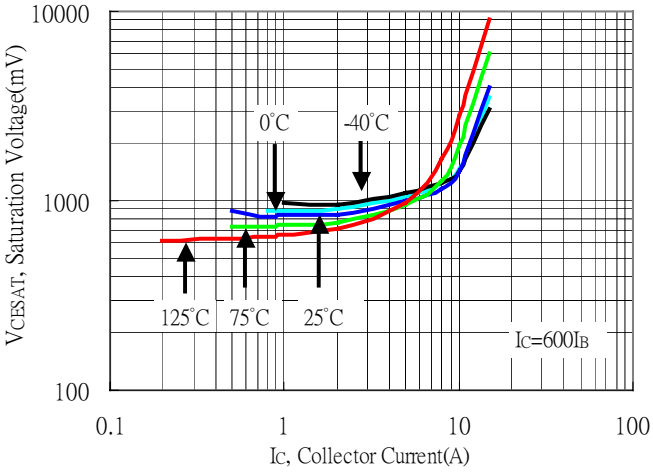
Saturation Voltage vs Collector Current



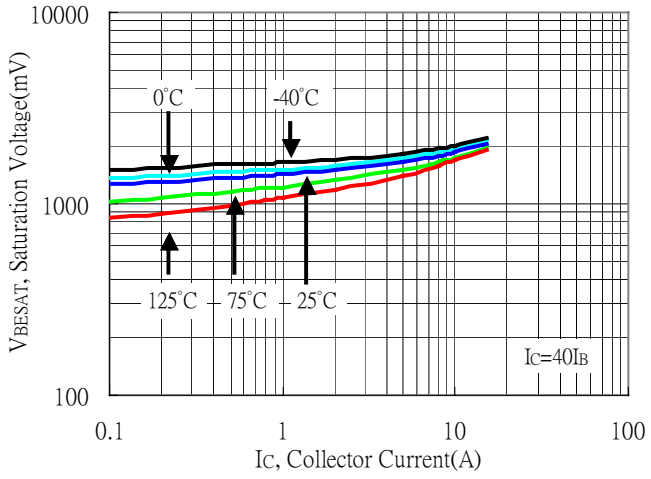
Saturation Voltage vs Collector Current



Saturation Voltage vs Collector Current

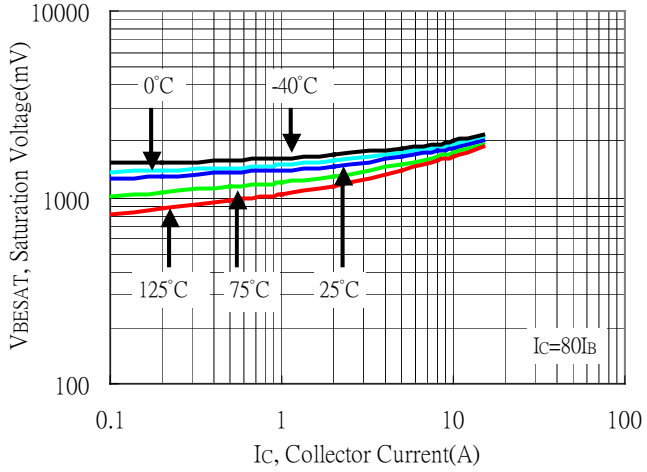


Saturation Voltage vs Collector Current

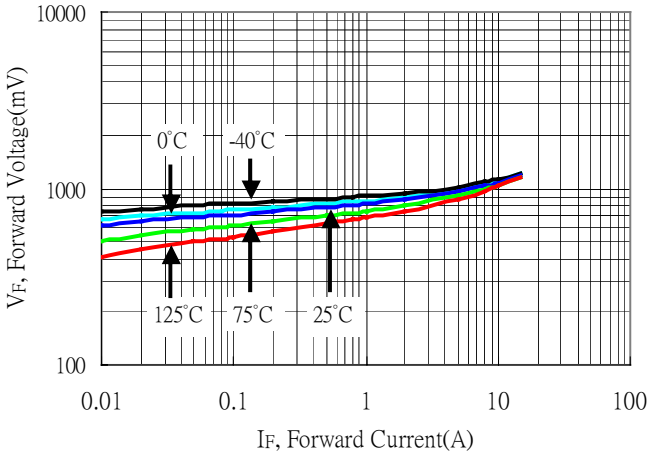


Typical Characteristics(Cont.)

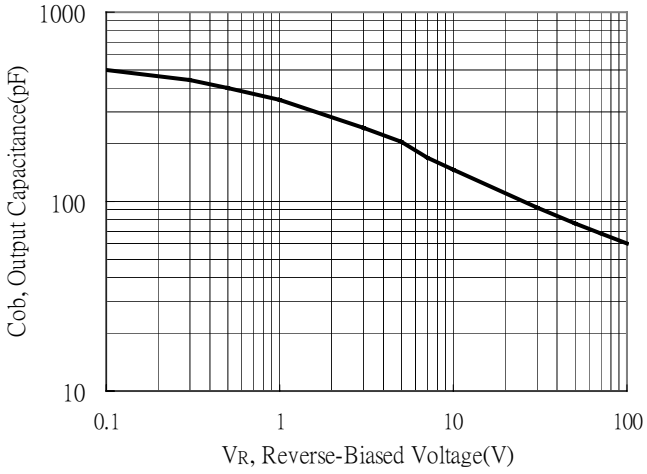
Saturation Voltage vs Collector Current



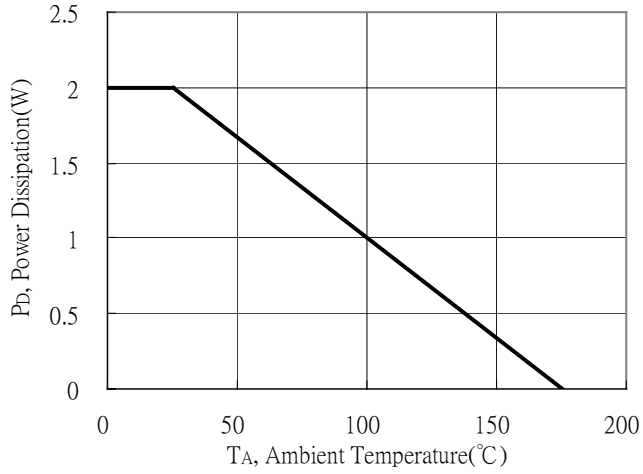
Built-in Diode Forward Characteristics



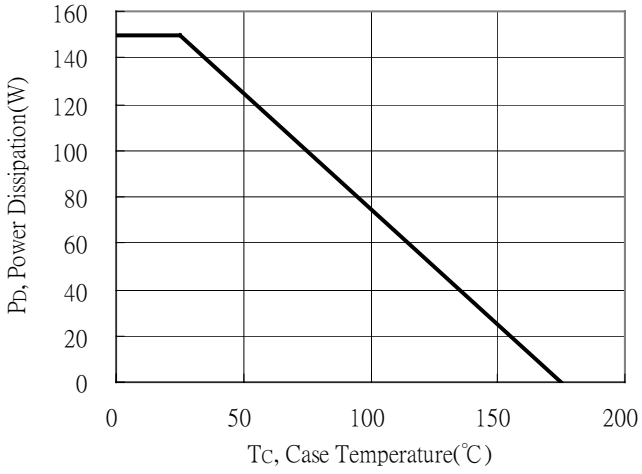
Output Capacitance vs Reverse-Biased Voltage



Power Derating Curve



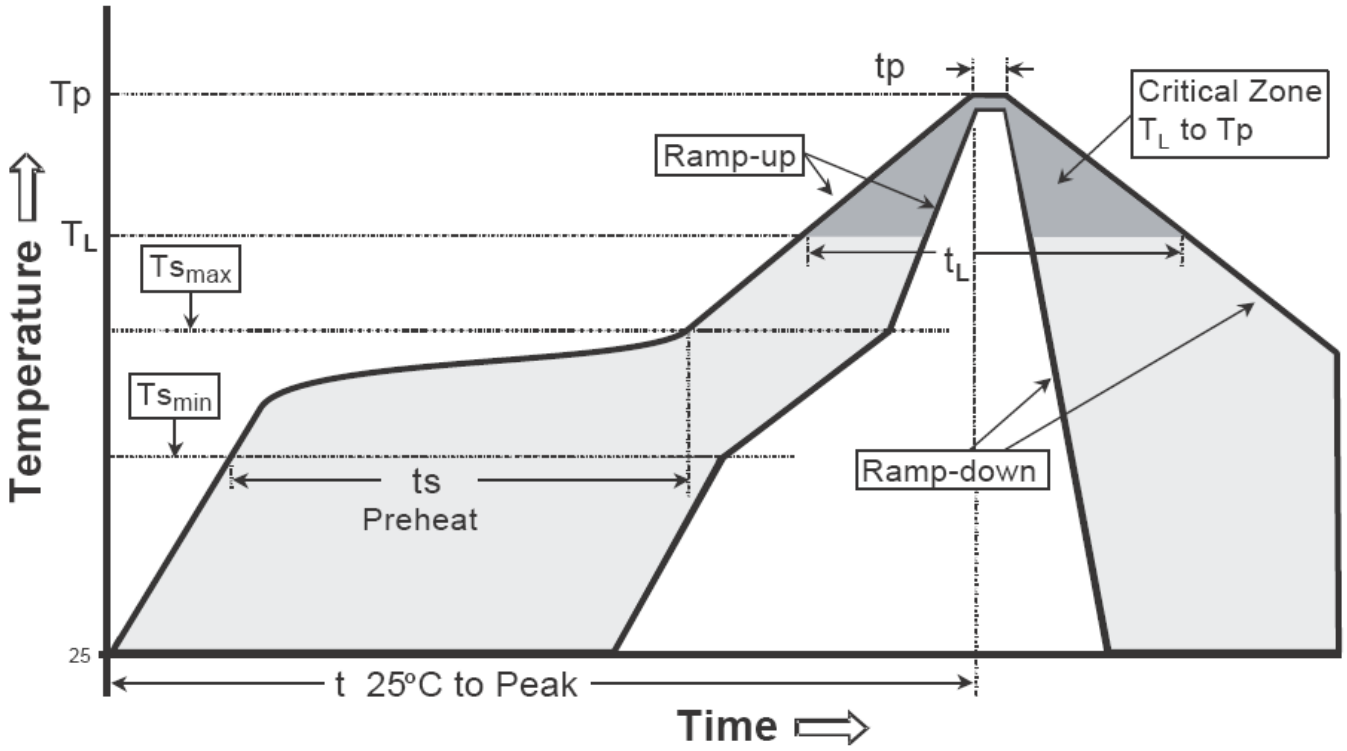
Power Derating Curve



Recommended wave soldering condition

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

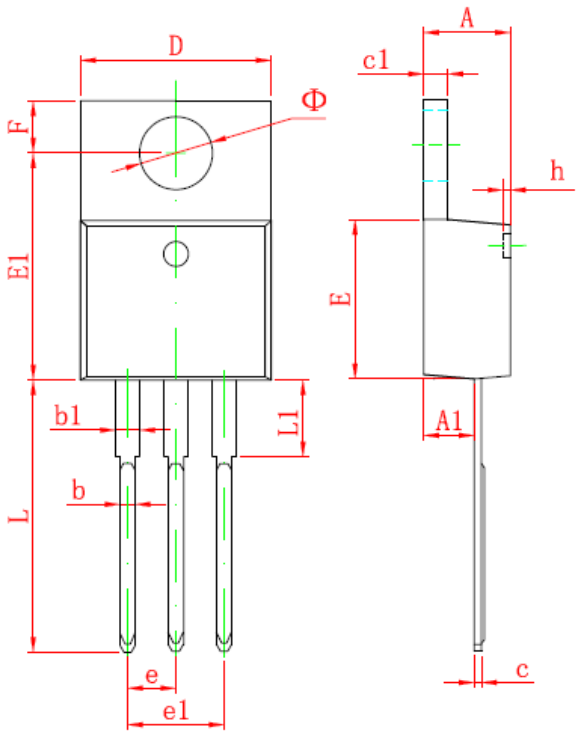
Recommended temperature profile for IR reflow



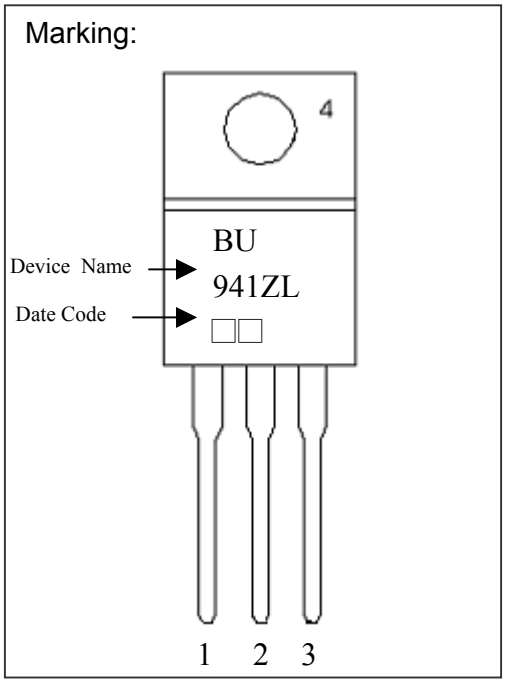
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 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-220 Dimension



3-Lead TO-220 Plastic Package
CYStek Package Code: E3



Style: Pin 1.Base 2.Collector 3.Emitter
4.Collector

*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184	E1	12.060	12.460	0.475	0.491
A1	2.520	2.820	0.099	0.111	e	2.540*		0.100*	
b	0.710	0.910	0.028	0.036	e1	4.980	5.180	0.196	0.204
b1	1.170	1.370	0.046	0.054	F	2.590	2.890	0.102	0.114
c	0.310	0.530	0.012	0.021	h	0.000	0.300	0.000	0.012
c1	1.170	1.370	0.046	0.054	L	13.400	13.800	0.528	0.543
D	10.010	10.310	0.394	0.406	L1	3.560	3.960	0.140	0.156
E	8.500	8.900	0.335	0.350	Φ	3.735	3.935	0.147	0.155

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.