

NPN Epitaxial Planar Transistor

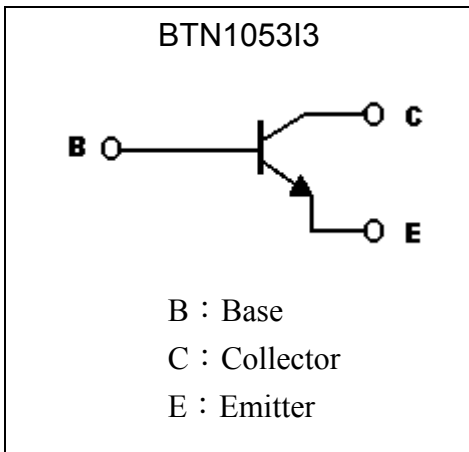
BTN1053I3

BV_{CEO}	80V
I_C	2.5A
$R_{CESAT(MAX)}$	150mΩ

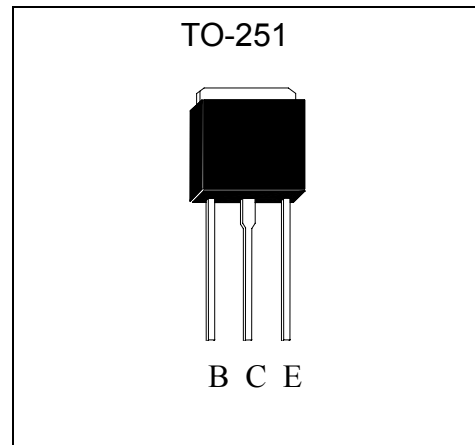
Features

- Excellent H_{FE} Characteristics up to 1A
- Low Saturation Voltage, $V_{CE(sat)}=0.11V(typ)@I_C=1A, I_B=50mA$
- 5A peak pulse current
- Pb-free lead plating and halogen-free package

Symbol

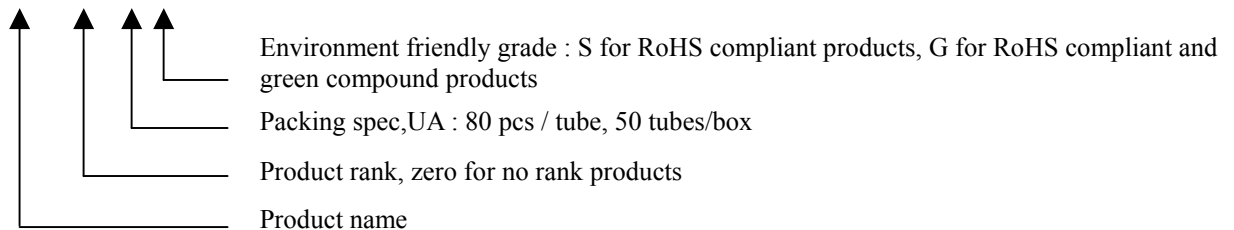


Outline



Ordering Information

Device	Package	Shipping
BTN1053I3-0-UA-G	TO-251 (Pb-free lead plating and halogen-free package)	80 pcs/tube, 50 tubes/box





Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CBO}	150	V
Collector-Emitter Voltage	V _{CEO}	80	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current(DC)	I _C	2.5	A
Collector Current(Pulsed) (Note 1)	I _{CP}	5	
Power Dissipation @T _A =25°C	P _D	1.5	W
Power Dissipation @T _C =25°C		10	
Operating Junction Temperature and Storage Range	T _j ; T _{stg}	-55~+150	°C

Note 1: Single pulse, Pw≤300μs, Duty Cycle≤2%.

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{th,j-c}	12.5	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	83.3	°C/W

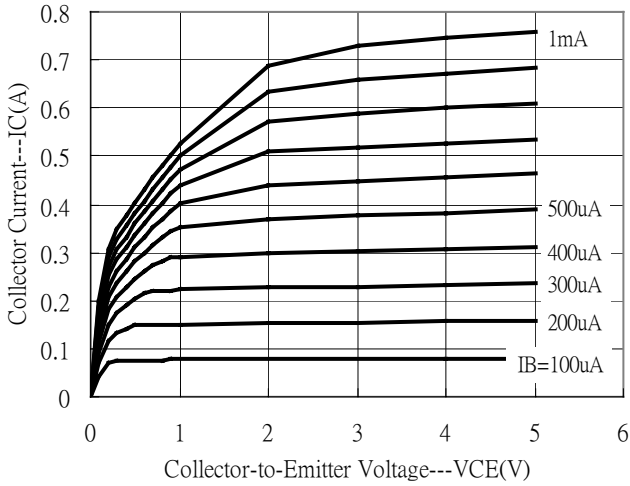
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	150	250	-	V	I _C =100μA
BV _{CES}	150	250	-	V	I _C =100μA
BV _{CEO}	80	110	-	V	I _C =10mA
BV _{EBO}	6	7.4	-	V	I _E =100μA
I _{CBO}	-	-	100	nA	V _{CB} =150V
I _{CES}	-	-	100	nA	V _{CE} =150V
I _{EBO}	-	-	100	nA	V _{EB} =5V
V _{CE(sat)} 1 *	-	28	40	mV	I _C =200mA, I _B =20mA
V _{CE(sat)} 2 *	-	80	150	mV	I _C =500mA, I _B =20mA
V _{CE(sat)} 3 *	-	270	400	mV	I _C =1A, I _B =10mA
V _{CE(sat)} 4 *	-	110	250	mV	I _C =1A, I _B =50mA
V _{CE(sat)} 5 *	-	210	300	mV	I _C =2A, I _B =100mA
V _{BE(sat)} *	-	0.9	1.2	V	I _C =1A, I _B =50mA
V _{BE(on)} *	-	0.9	1.2	V	V _{CE} =2V, I _C =3A
h _{FE} 1 *	300	570	-	-	V _{CE} =2V, I _C =10mA
h _{FE} 2 *	300	550	820	-	V _{CE} =2V, I _C =500mA
h _{FE} 3 *	120	300	-	-	V _{CE} =2V, I _C =1A
h _{FE} 4 *	30	100	-	-	V _{CE} =2V, I _C =2A
f _T	-	140	-	MHz	V _{CE} =10V, I _C =50mA, f=100MHz
Cob	-	23	-	pF	V _{CB} =10V, I _E =0A, f=1MHz

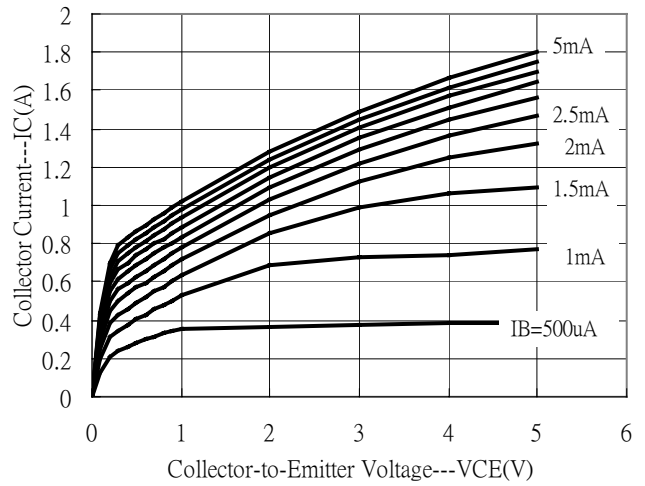
*Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

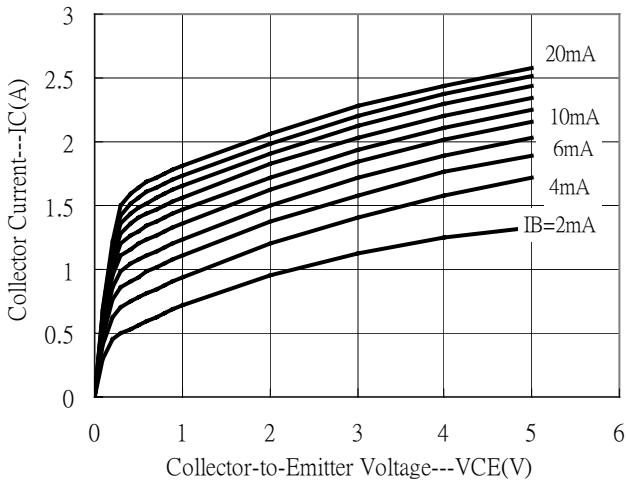
Emitter Grounded Output Characteristics



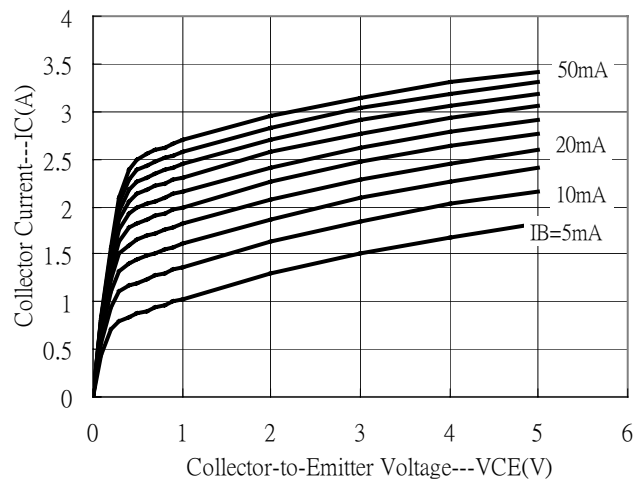
Emitter Grounded Output Characteristics



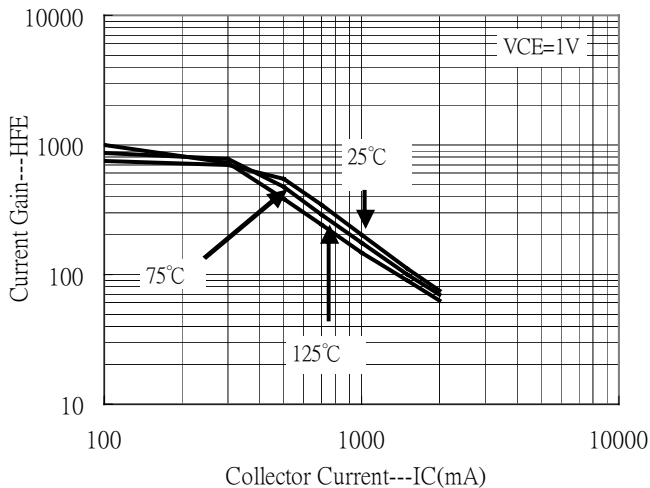
Emitter Grounded Output Characteristics



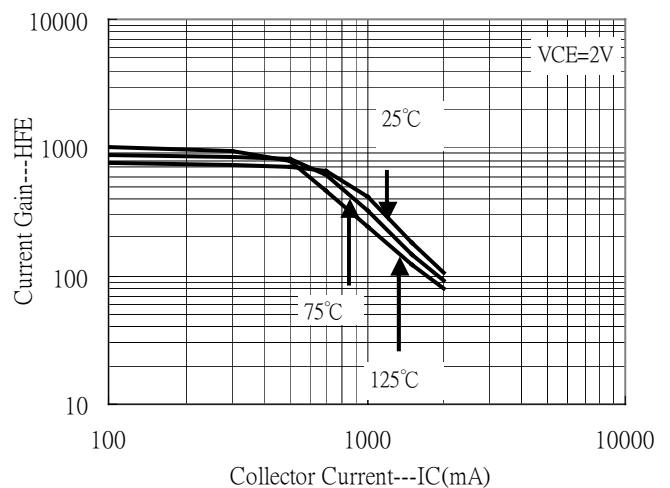
Emitter Grounded Output Characteristics



Current Gain vs Collector Current

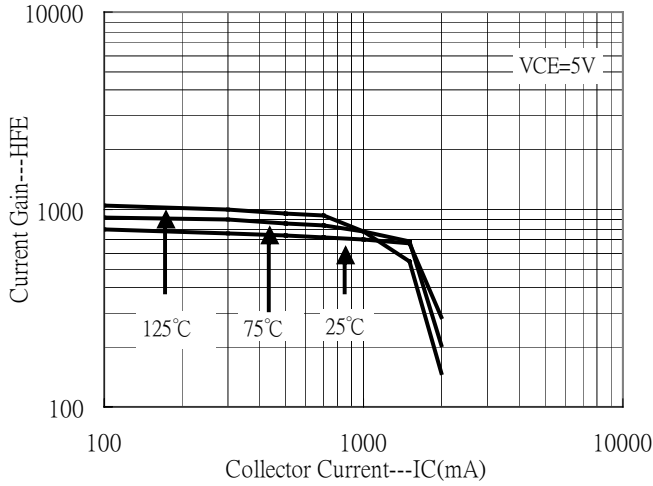


Current Gain vs Collector Current

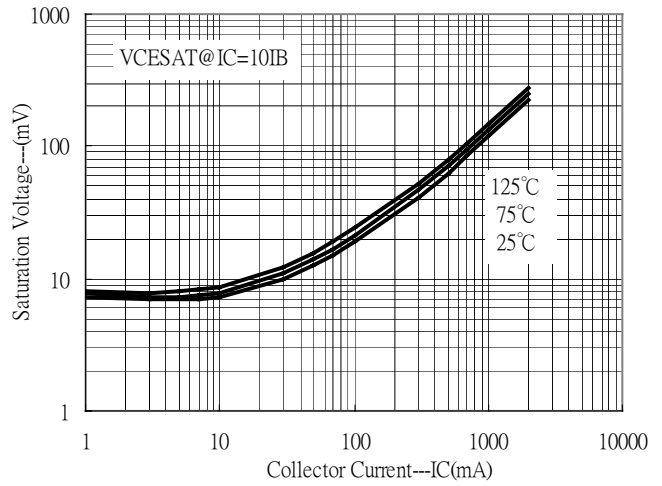


Typical Characteristics(Cont.)

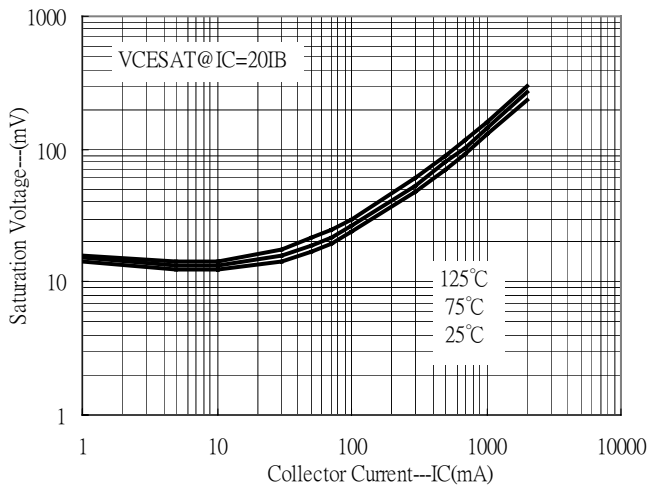
Current Gain vs Collector Current



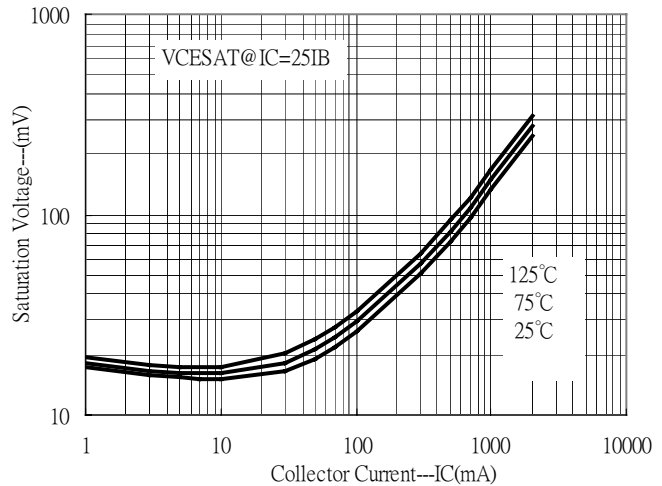
Saturation Voltage vs Collector Current



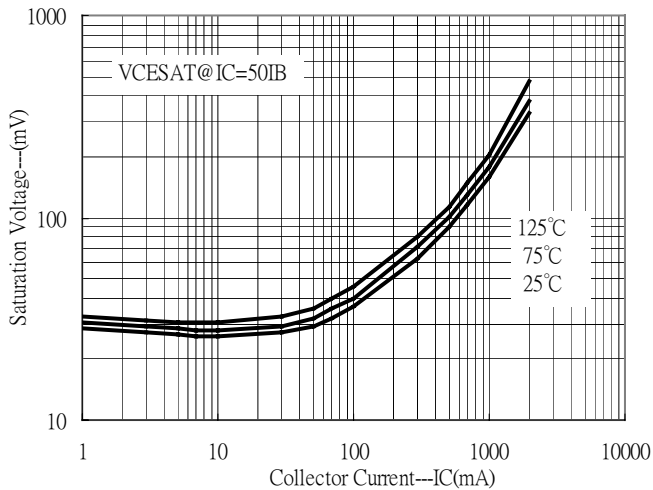
Saturation Voltage vs Collector Current



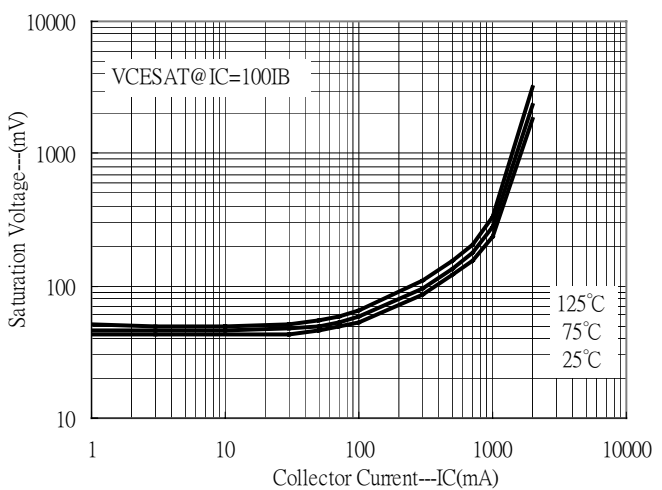
Saturation Voltage vs Collector Current



Saturation Voltage vs Collector Current

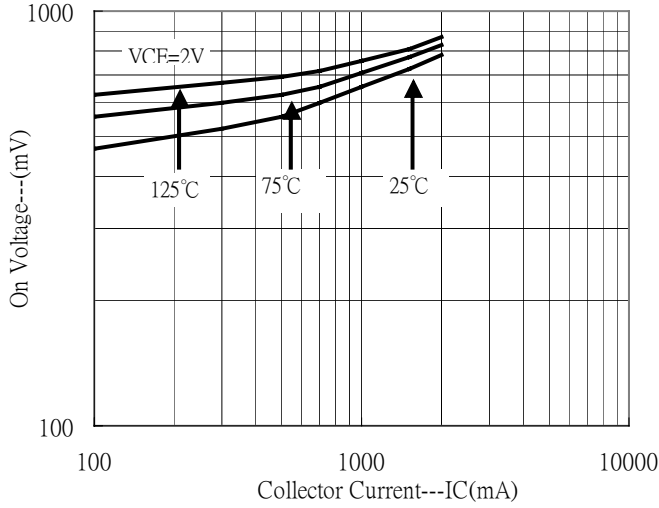


Saturation Voltage vs Collector Current

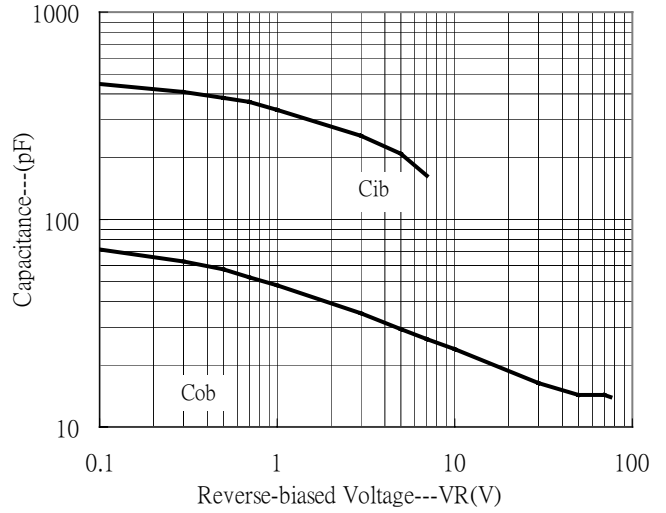


Typical Characteristics(Cont.)

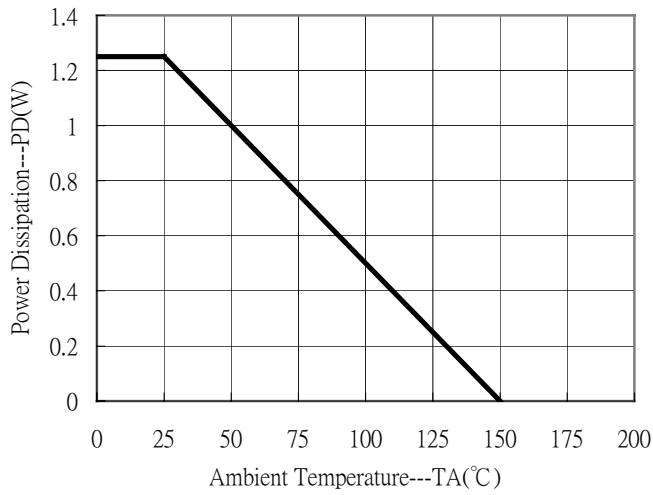
On Voltage vs Collector Current



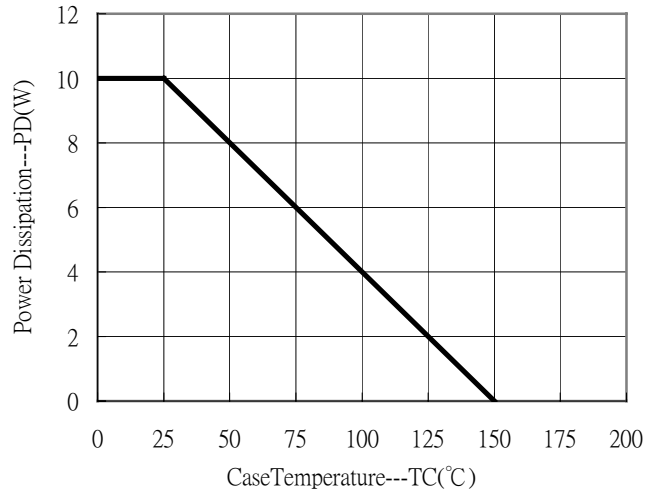
Capacitance vs Reverse-biased Voltage



Power Derating Curve



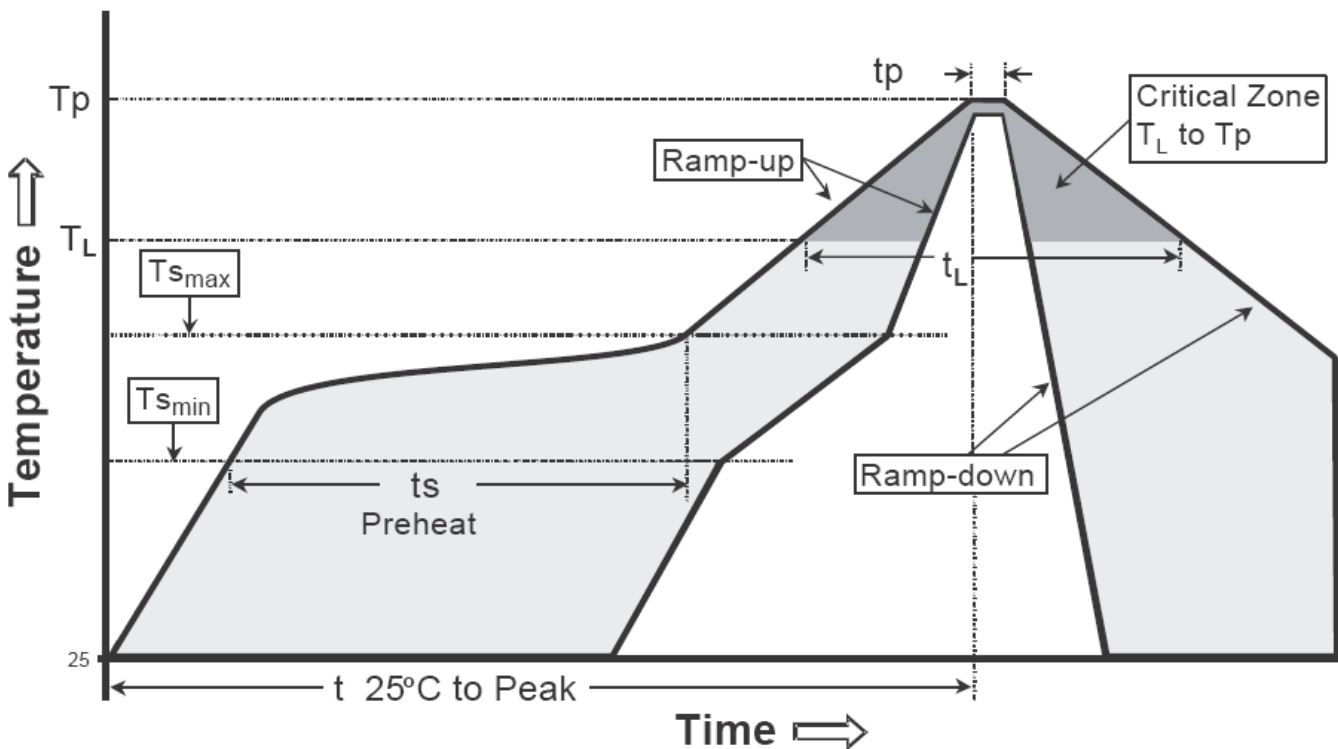
Power Derating Curve



Recommended wave soldering condition

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

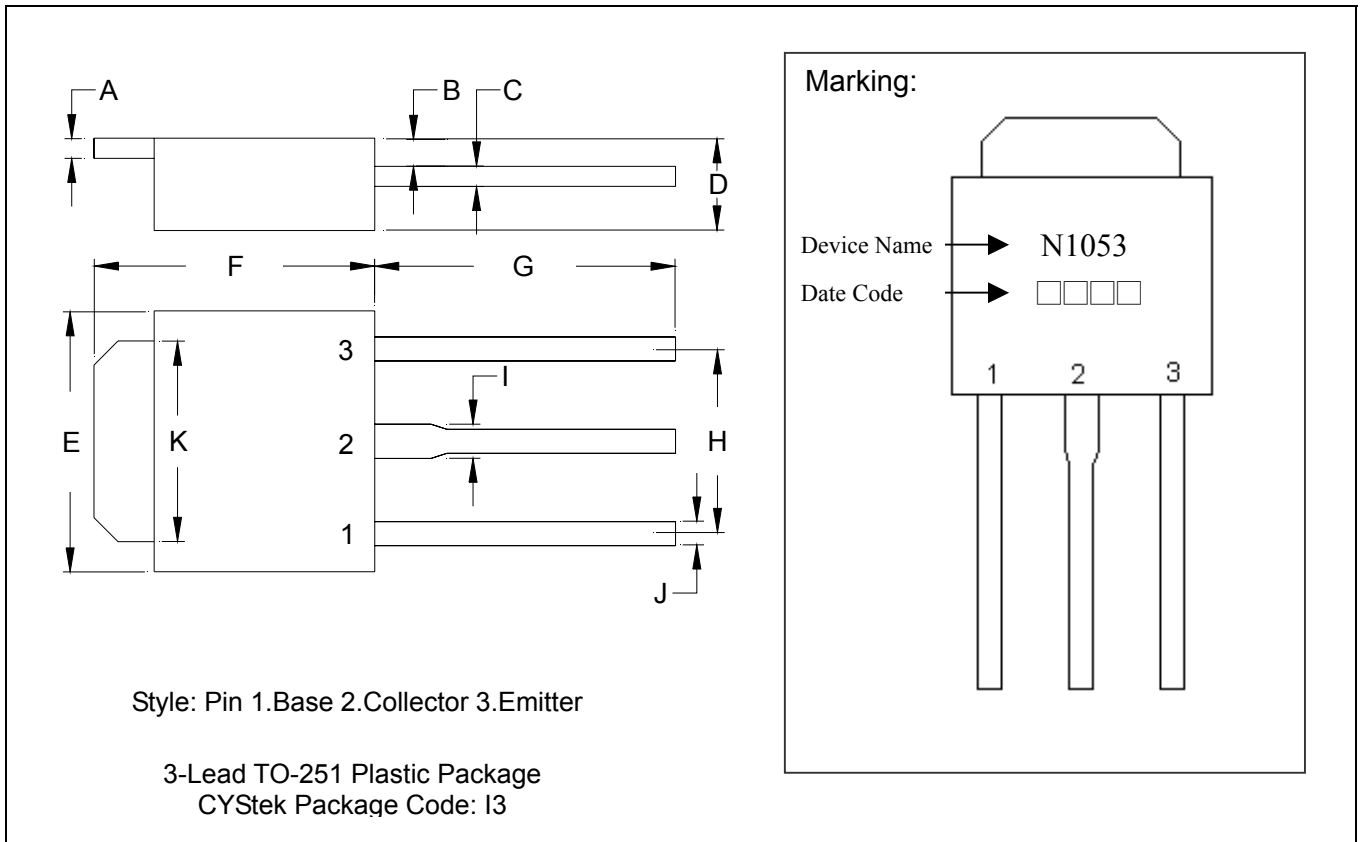
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	60-150 seconds
Peak Temperature(T _P)	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-251 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0177	0.0217	0.45	0.55	G	0.2559	-	6.50	-
B	0.0354	0.0591	0.90	1.50	H	-	*0.1811	-	*4.60
C	0.0177	0.0236	0.45	0.60	I	-	0.0449	-	1.14
D	0.0866	0.0945	2.20	2.40	J	-	0.0346	-	0.88
E	0.2441	0.2677	6.20	6.80	K	0.2047	0.2165	5.20	5.50
F	0.2677	0.2835	6.80	7.20					

- 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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