

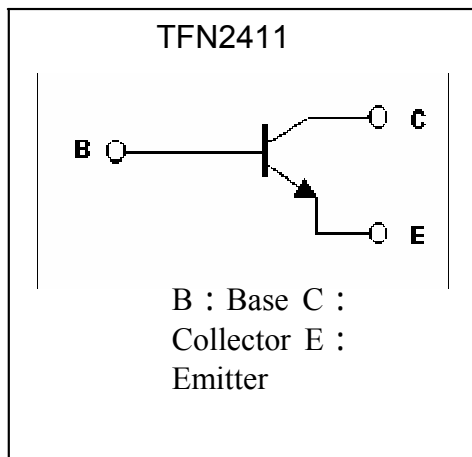
TFN2411

40V 600mA NPN Transistor

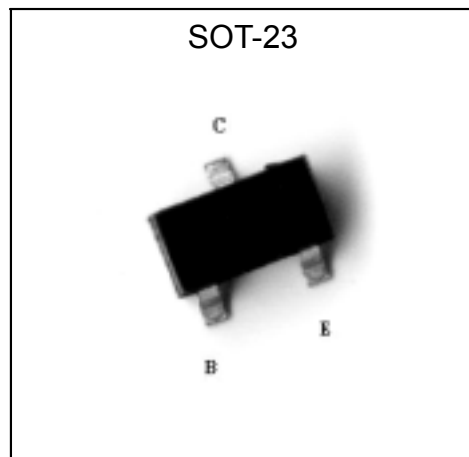
Description

- The TFN2411 is designed for using in driver stage of AF amplifier and general purpose switching application.
- High $I_{C(Max)}$, $I_{C(Max)} = 0.6A$.
- Low $V_{CE(sat)}$, Typ. $V_{CE(sat)} = 0.4V$ at $I_C/I_B = 500mA/50mA$.
Optimal for low Voltage operation.
- Complementary to TFN1036.
- Pb-free package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	0.6	A
Power Dissipation (Ta=25°C)	P_D	225 (Note)	mW
Power Dissipation (Tc=25°C)	P_D	560	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556 (Note)	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	223	°C/W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55~+150	°C

Note : Free air condition



Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	75	-	-	V	I _C =10μA
BV _{CEO}	40	-	-	V	I _C =10mA
BV _{EBO}	6	-	-	V	I _E =10μA
I _{CBO}	-	-	10	nA	V _{CB} =60V
I _{CEX}	-	-	10	nA	V _{CE} =60V, V _{BE} =-3V
I _{EBO}	-	-	10	nA	V _{EB} =3V
*V _{CE(sat)} 1	-	-	0.5	V	I _C =380mA, I _B =10mA
*V _{CE(sat)} 2	-	-	0.4	V	I _C =150mA, I _B =15mA
*V _{CE(sat)} 3	-	-	0.75	V	I _C =500mA, I _B =50mA
*V _{BE(sat)} 1	0.75	-	0.95	V	I _C =150mA, I _B =15mA
*V _{BE(sat)} 2	-	-	1.2	V	I _C =500mA, I _B =50mA
*h _{FE} 1	85	-	-		V _{CE} =1V, I _C =0.1mA
*h _{FE} 2	90	-	-		V _{CE} =1V, I _C =1mA
*h _{FE} 3	95	-	-		V _{CE} =1V, I _C =10mA
*h _{FE} 4	100	-	300		V _{CE} =1V, I _C =150mA
*h _{FE} 5	40	-	-		V _{CE} =2V, I _C =500mA
f _T	300	-	-	MHz	V _{CE} =5V, I _C =20mA, f=100MHz
Cob	-	6	-	pF	V _{CB} =5V, f=1MHz

*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Ordering Information

Device	Package	Shipping	Marking
TFN2411	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	2X

Recommended Storage Condition:

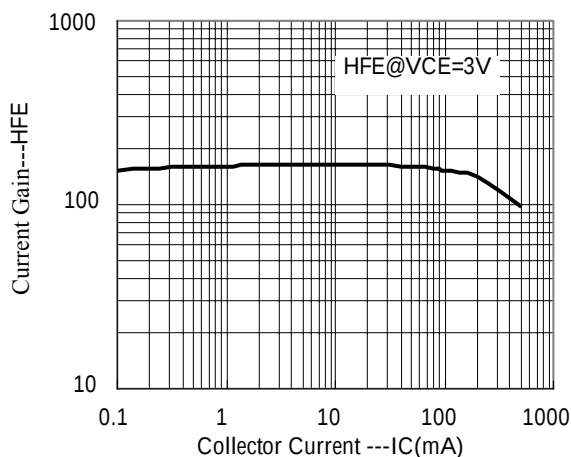
Temperature : ≤ 30 °C

Humidity : ≤ 60% RH

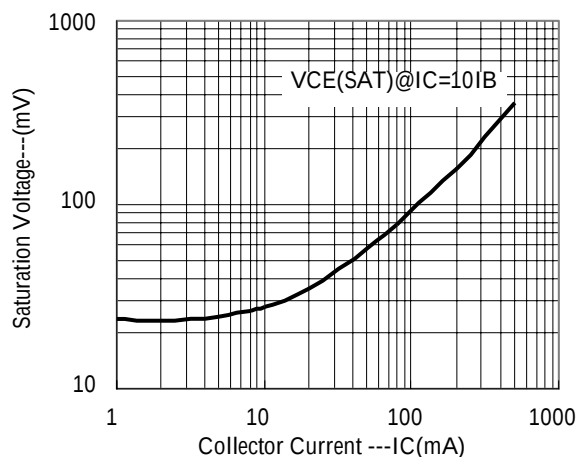


Characteristic Curves

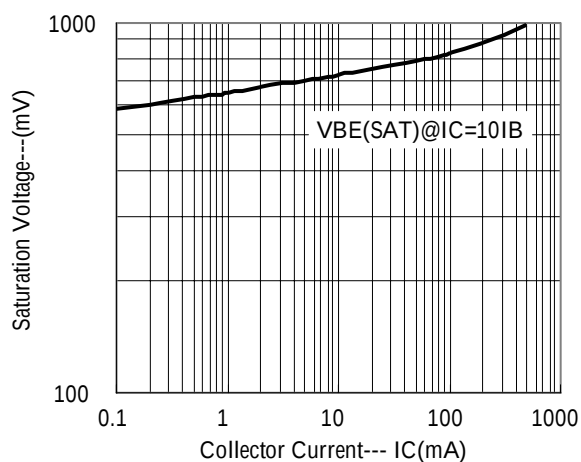
Current Gain vs Collector Current



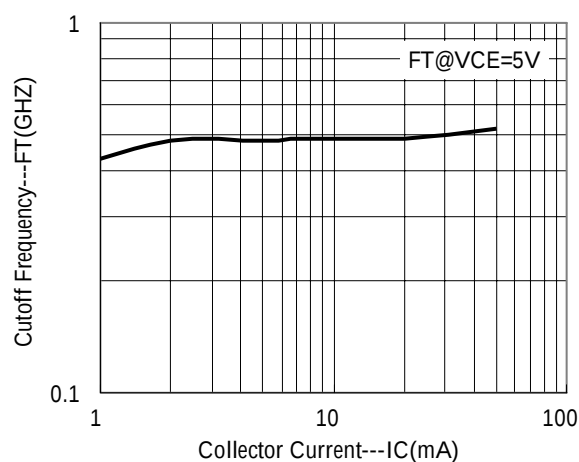
Saturation Voltage vs Collector Current



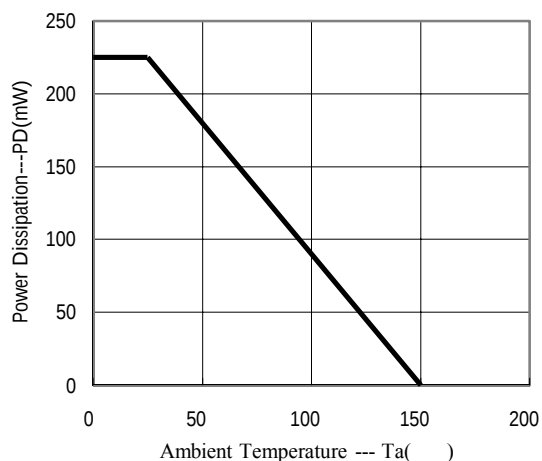
Saturation Voltage vs Collector Current



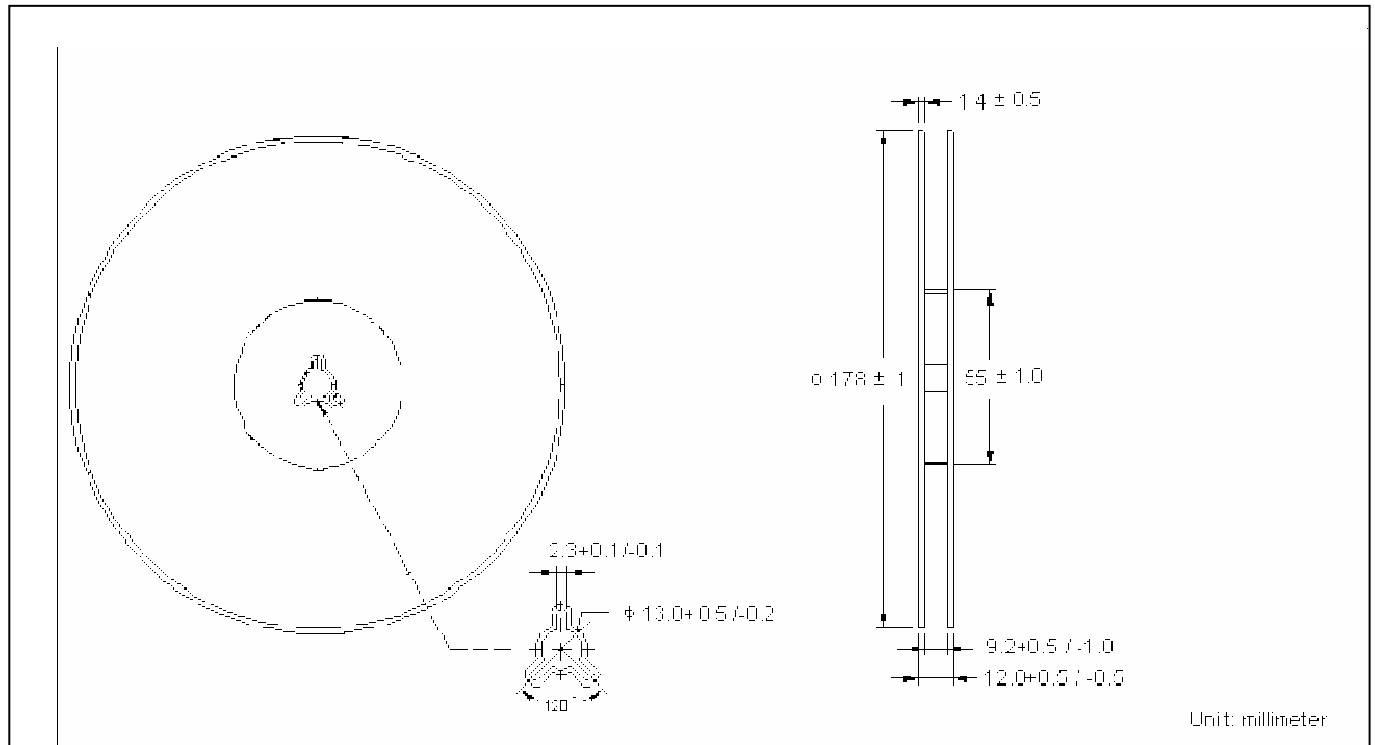
Cutoff Frequency vs Collector Current



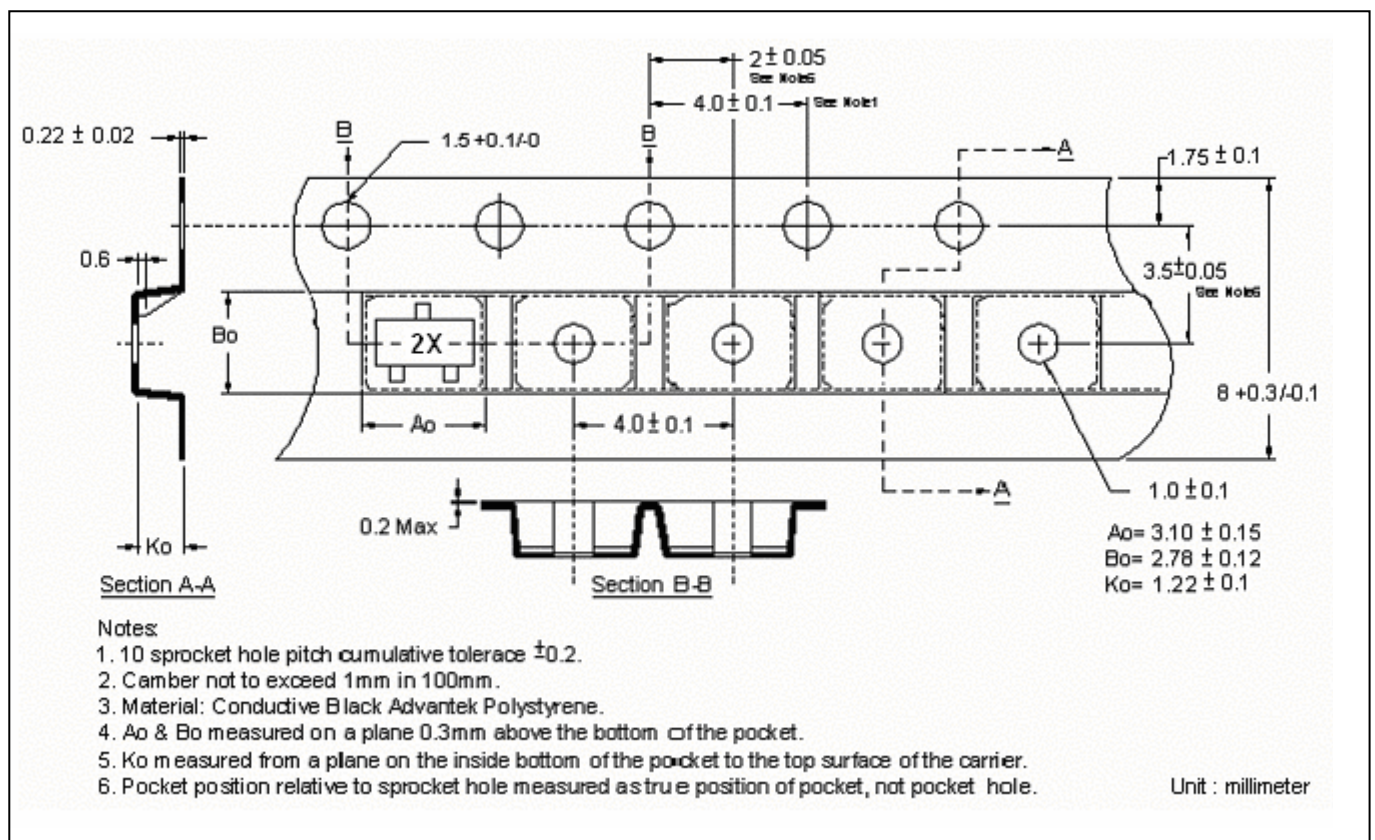
Power Derating Curve



Reel Dimension



Carrier Tape Dimension

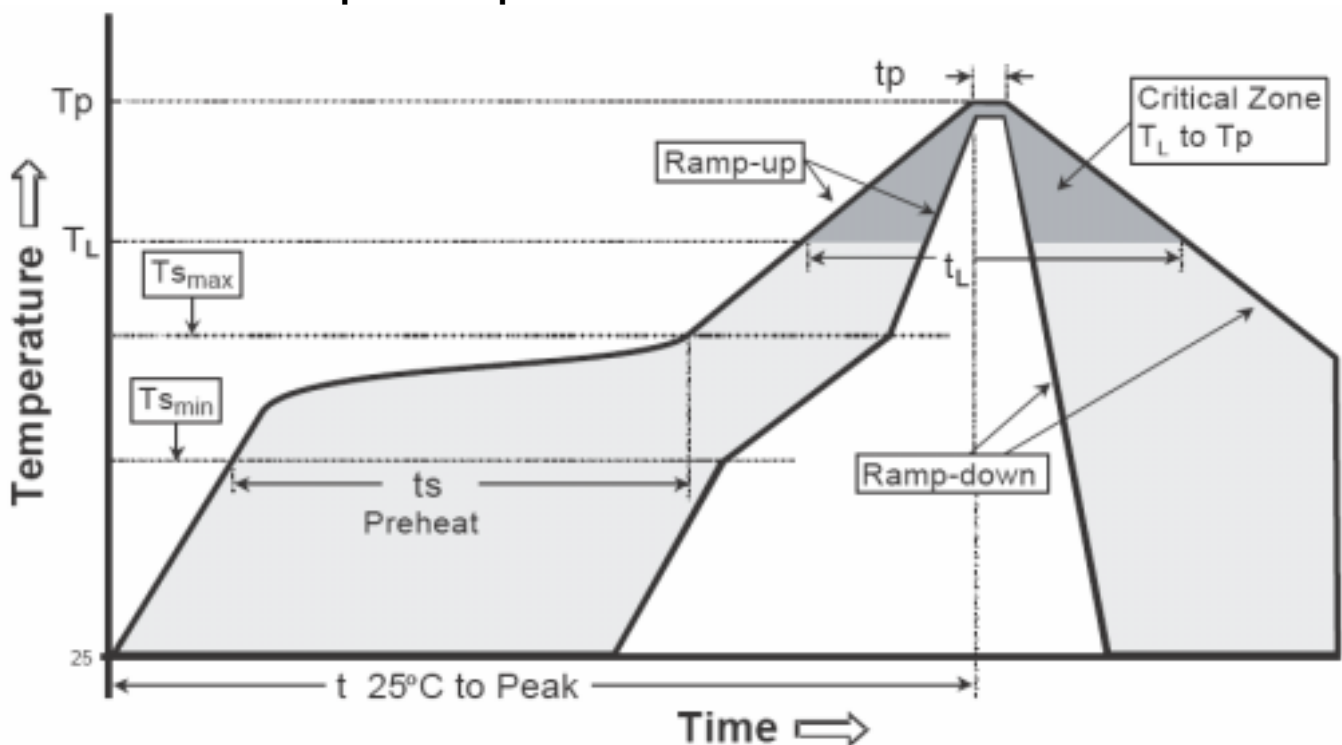




Recommended wave soldering condition

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

Recommended temperature profile for IR reflow

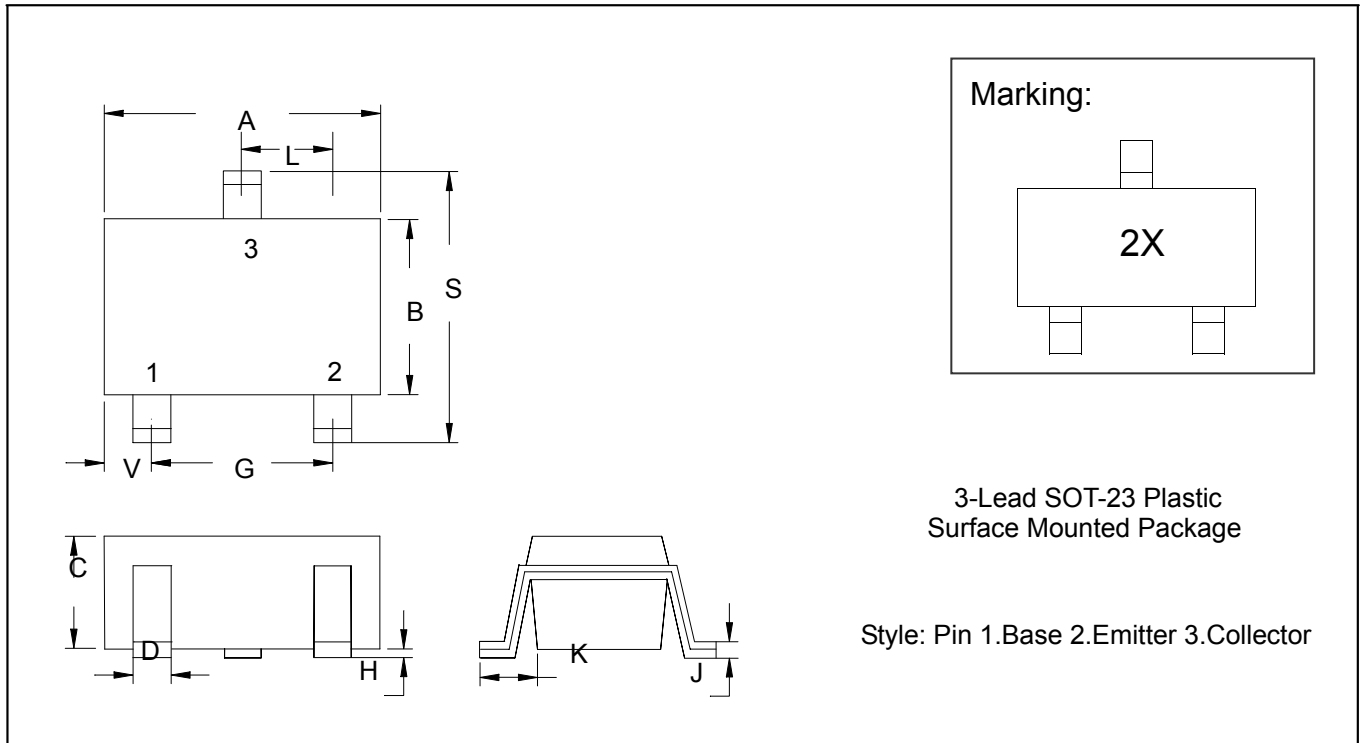


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T_{smax} to T_p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T_{smin})	100°C	150°C
-Temperature Max(T_{smax})	150°C	200°C
-Time(t_{smin} to t_{smax})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (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(t_p)	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.



SOT-23 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0034	0.0070	0.085	0.177
B	0.0472	0.0630	1.20	1.60	K	0.0128	0.0266	0.32	0.67
C	0.0335	0.0512	0.85	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1083	2.10	2.75
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	0.0040	0.013	0.10					

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 Tin Far sales office.

Material:

- Lead: 42 Alloy ; pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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