

## NPN Epitaxial Silicon Transistor

### 1 Description

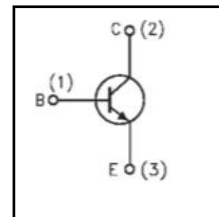
These devices are designed for high – voltage, high – speed power switching inductive circuits where fall time is critical. They are particularly suited for 115 and 220 V SWITCHMODE applications

### 2 Features

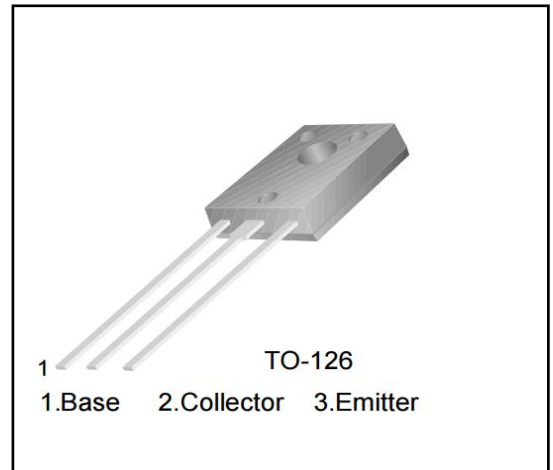
- High current output up to 1.5A
- Low saturation voltage
- High voltage
- High reliability

### 3 Applications

- Switching Regulators
- Inverters
- Motor Controls
- Solenoid/Relay drivers and Deflection circuits



$B_{VCB} = 700V$   
 $B_{VCE} = 450V$   
 $V_{CESAT (TYP)} = 0.24V$   
 $I_C = 1.5A$



### 4 Electrical Characteristics

#### 4.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Base Voltage	$V_{CBO}$	700	V
Collector-Emitter Voltage	$V_{CEO}$	450	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Collector Current (DC)	$I_C$	1.5	A
*Collector Current (Pulse)	$I_{CP}$	3	A
Base Current (DC)	$I_B$	0.75	A
*Base Current (Pulse)	$I_{BP}$	1.5	A
Collector Dissipation (TC=25°C)	$P_C$	35	W
Collector Dissipation (Ta=25°C)		1.4	W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	- 55 ~ 150	°C

\* PW≤10ms, Duty Cycle≤50%

#### 4.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	3.12	°C/W
Thermal Resistance, Junction to Ambient	$R_{thJA}$	89	°C/W

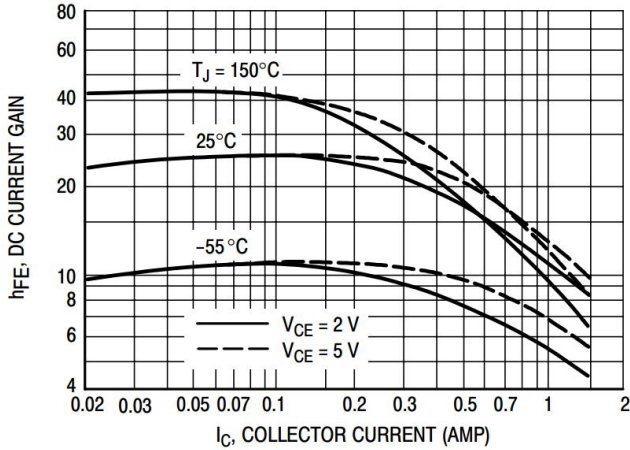
**4.3 Electrical Characteristics** (Tc=25°C, unless otherwise noted)

SYMBOL	PARAMETER	Test Conditions	Min	Typ	Max	Unit
I <sub>CBO</sub>	Collector Cut-off Current (V <sub>BE</sub> = 0)	V <sub>CE</sub> =700V	-	-	10	uA
I <sub>CEO</sub>	Collector Cut-off Current (I <sub>B</sub> = 0)	V <sub>CE</sub> =450V	-	-	50	uA
I <sub>EBO</sub>	Emitter Cut-off Current (I <sub>C</sub> = 0)	V <sub>EB</sub> =7V	-	-	10	uA
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0 )	I <sub>C</sub> =10mA	450	482	-	V
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage (I <sub>E</sub> = 0 )	I <sub>C</sub> =100uA	700	810	-	V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0 )	I <sub>E</sub> =100uA	7	15	-	V
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> =0.5A I <sub>B</sub> =50mA	-	0.18	0.5	V
		I <sub>C</sub> =1.0A I <sub>B</sub> =250mA	-	0.24	0.6	
		I <sub>C</sub> =1.5A I <sub>B</sub> =300mA	-	0.61	1.2	
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> =1.0A I <sub>B</sub> =300mA	-	1.1	1.5	
h <sub>FE</sub>	DC Current Gain	I <sub>C</sub> =5mA, V <sub>CE</sub> =5V	10	-	40	
		I <sub>C</sub> =200mA, V <sub>CE</sub> =5 V*	10	22	30	
		I <sub>C</sub> =1.0A, V <sub>CE</sub> =5 V	5	-	40	
f <sub>T</sub>	Transition Frequency	V <sub>CE</sub> =10V, I <sub>C</sub> =-500mA, f=10MHZ	3	-	-	MHz
TS	Storage Time	I <sub>C</sub> =0.25A (UI9600)	1.5		4	uS

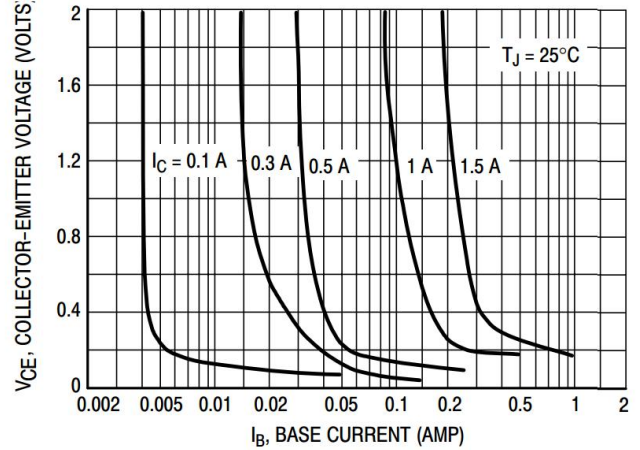
**h<sub>FE</sub>\* Classification**

Classification	1	2	3	4
h <sub>FE</sub> *	10-15	15-20	20-25	25-30

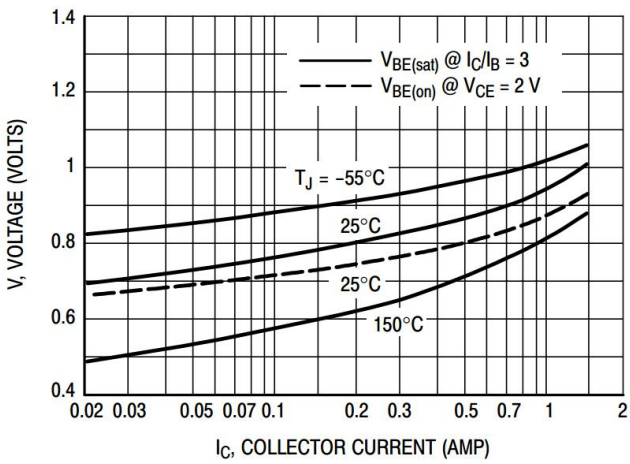
**5 Typical characteristics diagrams**



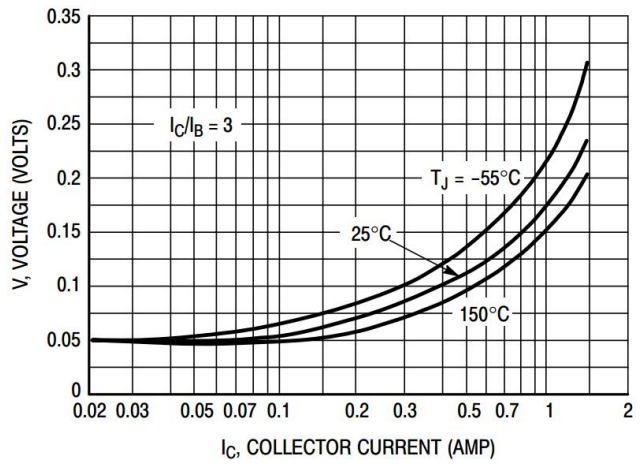
**Figure 1. DC Current Gain**



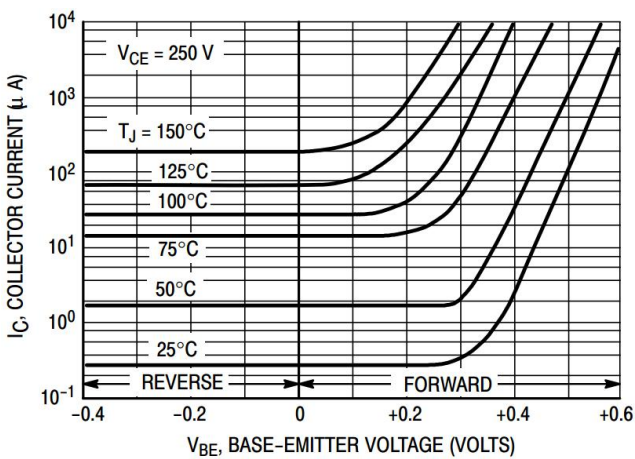
**Figure 2. Collector Saturation Region**



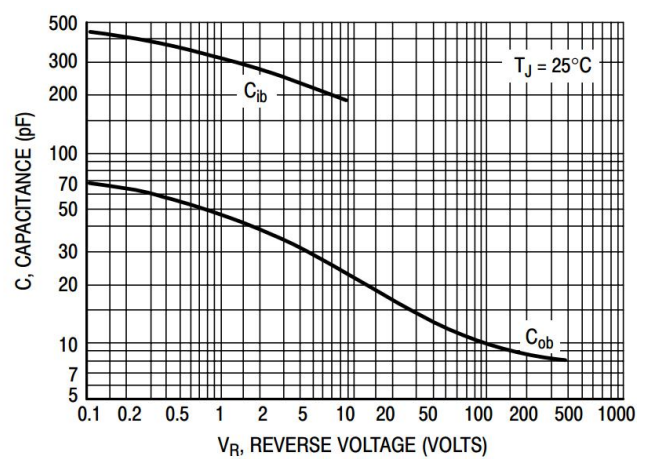
**Figure 3. Base-Emitter Voltage**



**Figure 4. Collector-Emmitter Saturation Region**



**Figure 5. Collector Cutoff Region**



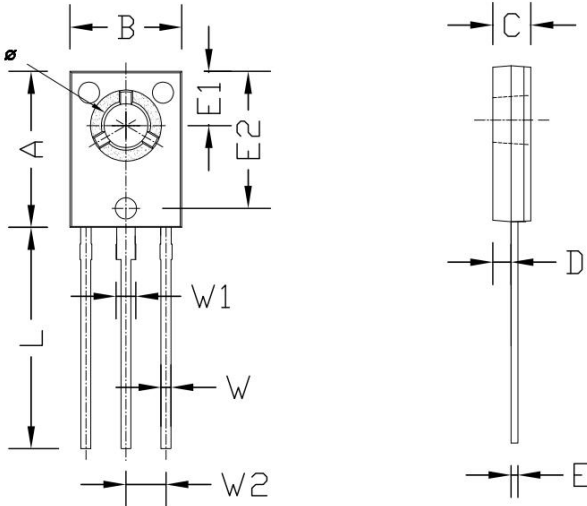
**Figure 6. Capacitance**

## 6 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
13003	TO-126	13003E5	Pb-free	bag	200/bag

## 7 Dimensions

TO-126 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	10.50	11.10	0.413	0.437
B	7.65	7.95	0.301	0.313
C	2.50	2.80	0.098	0.110
D	1.45	1.75	0.057	0.069
E	0.40	0.60	0.016	0.024
E1	3.65	3.85	0.144	0.152
E2	9.40	9.60	0.370	0.378
L	15.4	15.9	0.606	0.626
W	0.60	0.80	0.024	0.031
W1	1.20	1.30	0.047	0.051
W2	2.32 TYP		0.091 TYP	
Φ	3.05	3.35	0.120	0.132

## 8 Attentions

- ROUM Semiconductor Technology CO.,LTD. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
- It is the responsibility of the purchaser for any failure or failure of any semiconductor product under certain conditions. It is the responsibility of the purchaser to comply with safety standards and to take safety measures in the system design and machine manufacturing of Roma products in order to avoid potential risk of failure. Injury or property damage.
- Product promotion is endless, our company will be dedicated to provide customers with better products.

## 9 Appendix

Revision history:

Date	REV.	Description	Page
2017.04.11	1.0	Original	