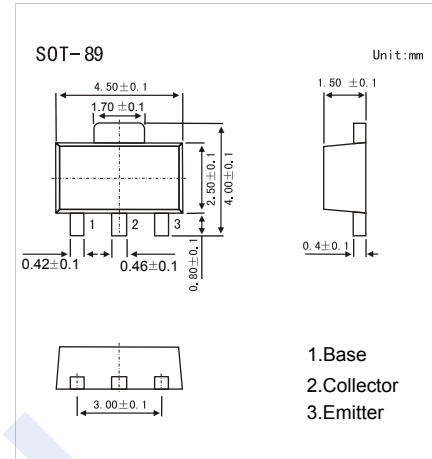


## NPN Transistors

### 2SD1615-HF

#### ■ Features

- Low  $V_{CE(sat)}$
- Complementary to 2SB1115-HF
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	$V_{CBO}$	60	V
Collector - Emitter Voltage	$V_{CEO}$	50	
Emitter - Base Voltage	$V_{EBO}$	6	
Collector Current - Continuous	$I_C$	1	A
Collector Current - Pulse (Note.1)	$I_{CP}$	2	
Collector Power Dissipation	$P_C$	2	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

Note.1:  $PW \leq 10$  ms, Duty cycle  $\leq 20\%$ .

#### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	$V_{CBO}$	$I_C = 100 \mu\text{A}$ , $I_E = 0$	60			V
Collector- emitter breakdown voltage	$V_{CEO}$	$I_C = 1 \text{ mA}$ , $I_B = 0$	50			
Emitter - base breakdown voltage	$V_{EBO}$	$I_E = 100 \mu\text{A}$ , $I_C = 0$	6			
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = 60 \text{ V}$ , $I_E = 0$			0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 6 \text{ V}$ , $I_C = 0$			0.1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1 \text{ A}$ , $I_B = 50 \text{ mA}$		0.15	0.3	V
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1 \text{ A}$ , $I_B = 50 \text{ mA}$		0.9	1.2	
Base - emitter voltage	$V_{BE}$	$V_{CE} = 2 \text{ V}$ , $I_C = 50 \text{ mA}$	0.6		0.7	
DC current gain	$h_{FE}$	$V_{CE} = 2 \text{ V}$ , $I_C = 100 \text{ mA}$	135	290	600	
		$V_{CE} = 2 \text{ V}$ , $I_C = 1 \text{ A}$	81	270		
Collector output capacitance	$C_{ob}$	$V_{CB} = 10 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$		19		$\mu\text{F}$
Transition frequency	$f_T$	$V_{CE} = 2 \text{ V}$ , $I_E = -100 \text{ mA}$	80	160		MHz

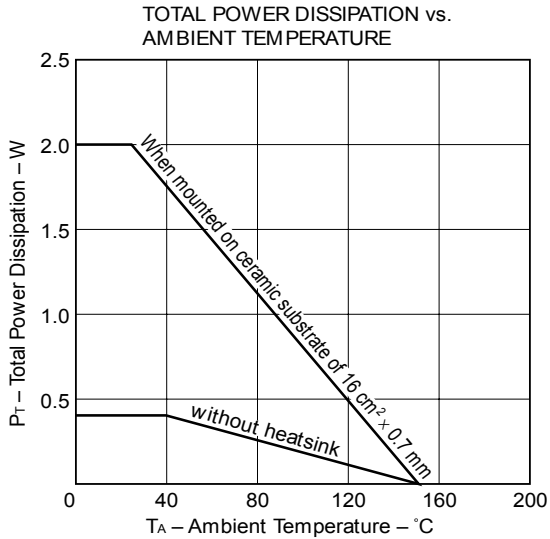
#### ■ Classification of $h_{FE}(1)$

Type	2SD1615-M-HF	2SD1615-L-HF	2SD1615-K-HF
Range	135-270	200-400	300-600
Marking	GM <sub>F</sub>	GL <sub>F</sub>	GK <sub>F</sub>

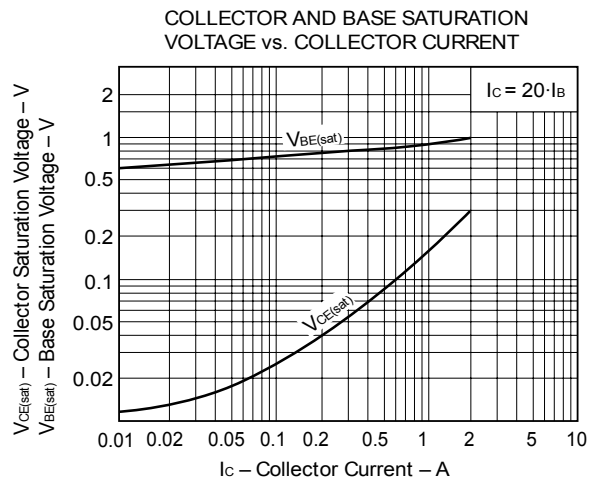
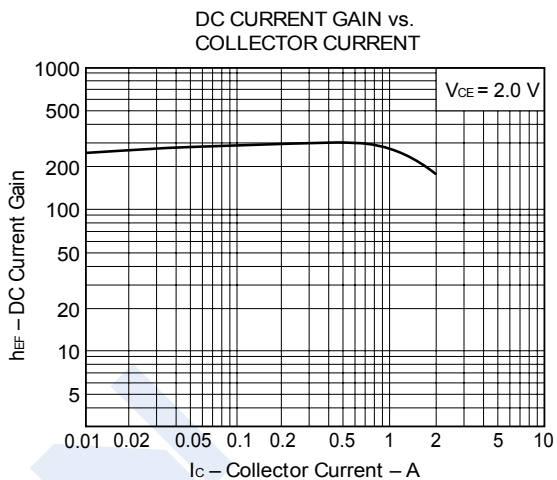
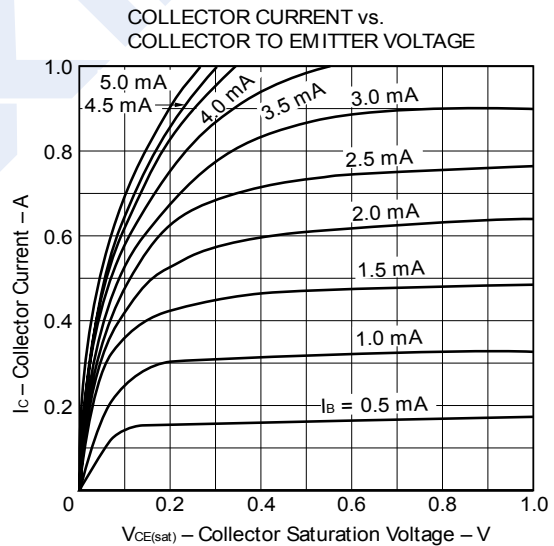
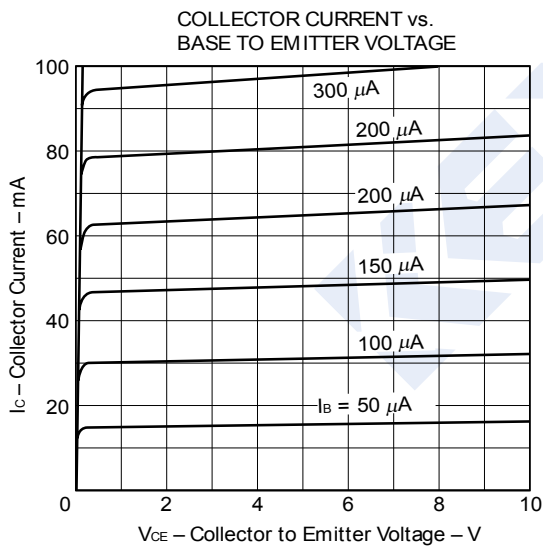
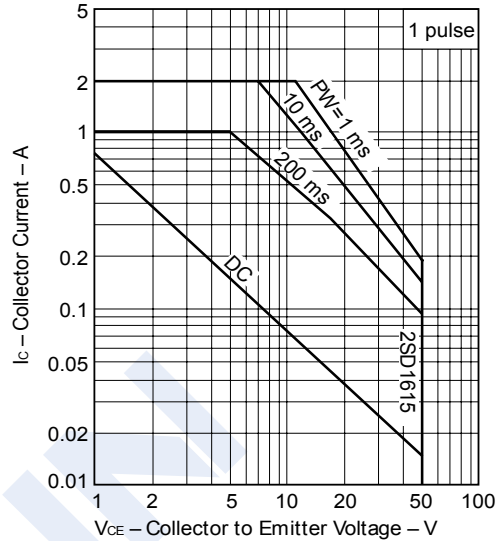
# NPN Transistors

## 2SD1615-HF

### Typical Characteristics



SAFE OPERATING AREA  
(TRANSIENT THERMAL RESISTANCE METHOD)



### NPN Transistors

### 2SD1615-HF

■ Typical Characteristics

