
**Pin Definition:**

1. Base
2. Collector
3. Emitter

**PRODUCT SUMMARY**

$BV_{CBO}$	180V
$BV_{CEO}$	160V
$I_C$	1.5A
$V_{CE(SAT)}$	0.3V @ $I_C = 1A, I_B = 100mA$

**Features**

- Low  $V_{CE(SAT)}$  0.15 @  $I_C = 1A, I_B = 100mA$  (Typ.)
- High  $BV_{CEO}$

**Structure**

- Epitaxial Planar Type
- NPN Silicon Transistor

**Ordering Information**

Part No.	Package	Packing
TSD1858CH C5G	TO-251	75pcs / Tube

Note: "G" denote for Halogen Free Product

**Absolute Maximum Rating** ( $T_A = 25^\circ C$  unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	$V_{CBO}$	180	V
Collector-Emitter Voltage	$V_{CEO}$	160	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	DC	1.5	A
	Pulse	3 (note1)	
Power Dissipation @ $T_A = 25^\circ C$	$P_D$	1	W
Power Dissipation @ $T_C = 25^\circ C$	$P_D$	15	W
Thermal Resistance - Junction to Case	$R\theta_{JC}$	125	$^\circ C/W$
Thermal Resistance - Junction to Ambient	$R\theta_{JA}$	8.33	$^\circ C/W$
Operating Junction Temperature	$T_J$	+150	$^\circ C$
Operating Junction and Storage Temperature Range	$T_{STG}$	- 55 to +150	$^\circ C$

Note: 1. Single pulse,  $P_w \leq 380\mu s$ , Duty  $\leq 2\%$

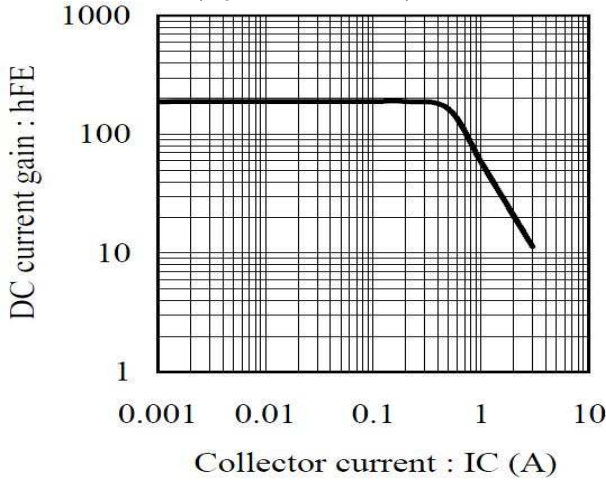
**Electrical Specifications** ( $T_A = 25^\circ C$  unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$I_C = 1mA, I_E = 0$	$BV_{CBO}$	180	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 10mA, I_B = 0$	$BV_{CEO}$	160	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 50\mu A, I_C = 0$	$BV_{EBO}$	5	--	--	V
Collector Cutoff Current	$V_{CB} = 160V, I_E = 0$	$I_{CBO}$	--	--	1	$\mu A$
Emitter Cutoff Current	$V_{EB} = 4V, I_C = 0$	$I_{EBO}$	--	--	1	$\mu A$
Collector-Emitter Saturation Voltage	$I_C = 1A, I_B = 100mA$	$V_{CE(SAT)}$	--	0.15	0.3	V
Base-Emitter Saturation Voltage	$V_{CE} = 5V, I_C = 5mA$	$V_{BE(ON)}$	--	--	0.8	V
DC Current Transfer Ratio	$V_{CE} = 5V, I_C = 200mA$	$h_{FE1}$	180	--	390	
	$V_{CE} = 5V, I_C = 500mA$	$h_{FE2}$	30	--	--	
Transition Frequency	$V_{CE} = 5V, I_E = 150mA, f = 100MHz$	$f_T$	--	200	--	MHz
Output Capacitance	$V_{CB} = 10V, f = 1MHz$	$C_{ob}$	--	13	--	pF

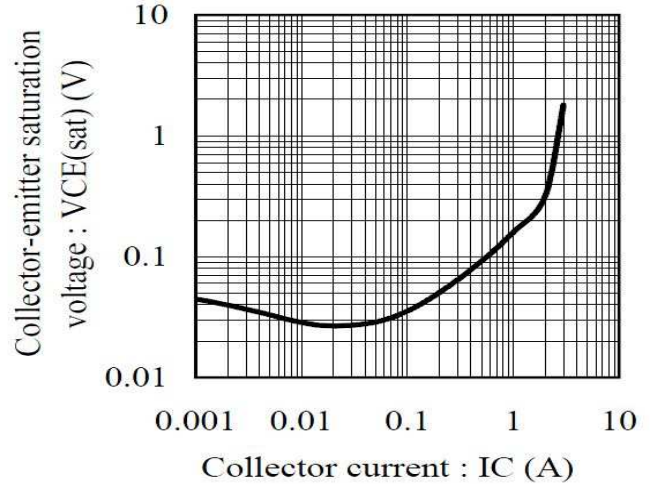
Note: Pulse test: pulse width  $\leq 380\mu s$ , Duty cycles  $\leq 2\%$

**Electrical Characteristics Curve** ( $T_A = 25^\circ\text{C}$ , unless otherwise noted)

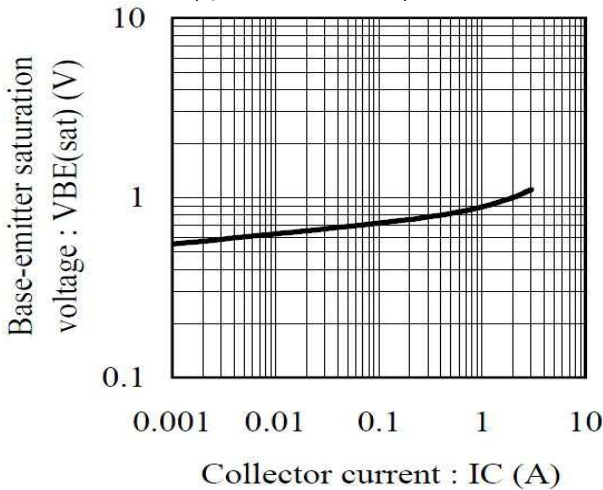
**Figure 1. DC Current Gain**  
( $V_{CE}=5\text{V}$ ,  $T_A=25^\circ\text{C}$ )



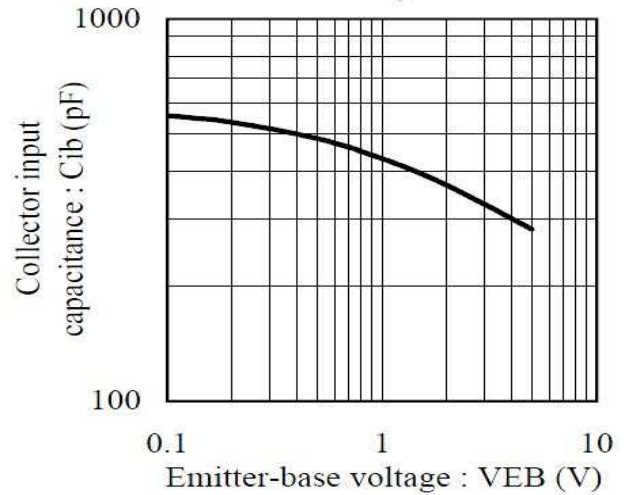
**Figure 2.  $V_{CE(SAT)}$  vs. Collector Current**  
( $I_C/I_B=10$ ,  $T_A=25^\circ\text{C}$ )



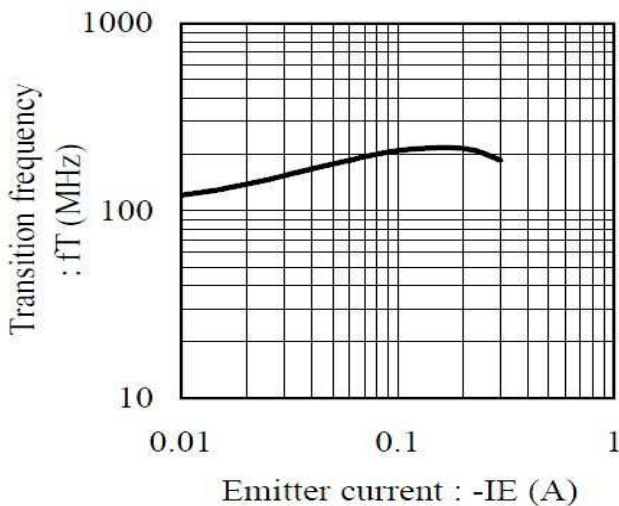
**Figure 3.  $V_{BE(SAT)}$  vs. Collector Current**  
( $I_C/I_B=10$ ,  $T_A=25^\circ\text{C}$ )



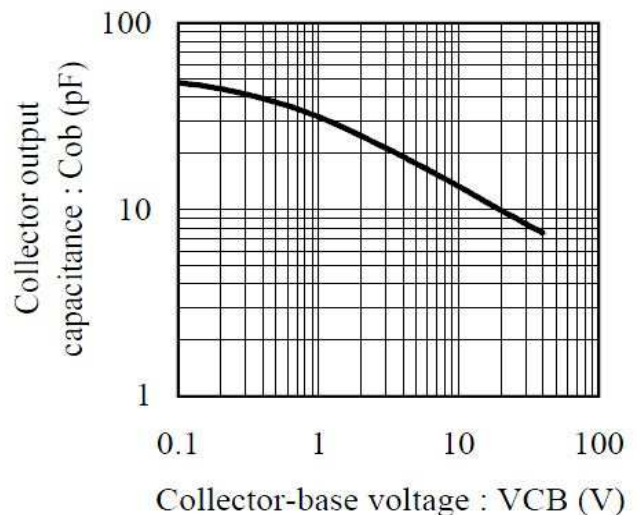
**Figure 4.  $C_{ib}$  vs.  $V_{CE}$**   
( $f=1\text{MHz}$ ,  $T_A=25^\circ\text{C}$ )



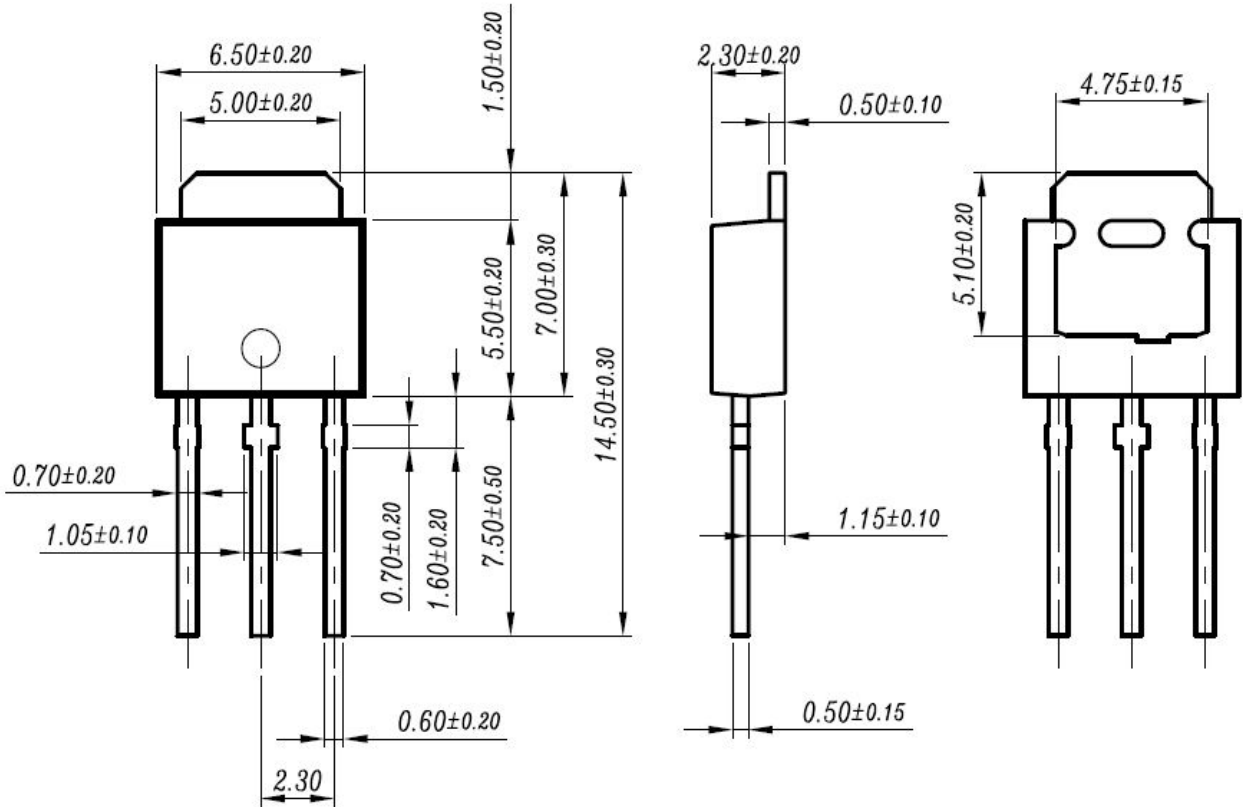
**Figure 5. Frequency vs. Emitter Current**  
( $V_{CE}=5\text{V}$ ,  $T_A=25^\circ\text{C}$ )



**Figure 6.  $C_{ob}$  vs.  $V_{CB}$**   
( $f=1\text{MHz}$ ,  $T_A=25^\circ\text{C}$ )

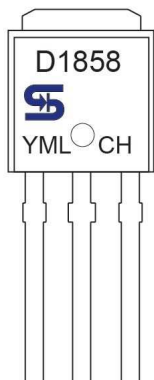


**TO-251 Mechanical Drawing**



Unit: Millimeters

**Marking Diagram**



- Y** = Year Code
- M** = Month Code for Halogen Free Product  
(O=Jan, P=Feb, Q=Mar, R=Apl, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)
- L** = Lot Code

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