

SMA4031

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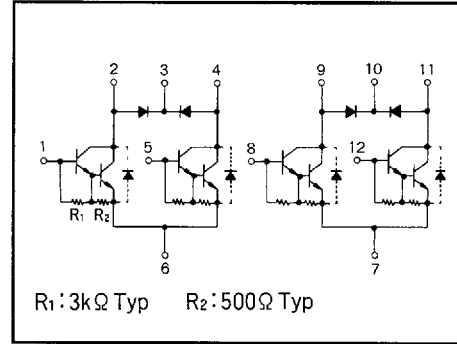
Silicon NPN Triple Diffused Planar Darlington

Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Rating	Unit
Collector-to-Base Voltage	V_{CB0}	120	V
Collector-to-Emitter Voltage	V_{CE0}	100	V
Emitter-to-Base Voltage	V_{EB0}	6	V
Collector Current	I_C	3	A
Collector Current	I_{CP}	5 ($P_w \leq 1\text{ms}$, $D_u \leq 50\%$)	A
Base Current	I_B	0.2	A
Diode Forward Current	I_F	3 ($P_w \leq 0.5\text{ms}$, $D_u \leq 25\%$)	A
Diode Forward Current	I_{FSM}	5 ($P_w \leq 10\text{ms}$, Single)	A
Diode Reverse Voltage	V_R	120V	
Total Power Dissipation	P_T	4 ($T_a = 25^\circ\text{C}$)	W
		20 ($T_c = 25^\circ\text{C}$)	
Storage Temperature	T_{stg}	-40 ~ +150	$^\circ\text{C}$

Equivalent Circuit Diagram



Electrical Characteristics

($T_a = 25^\circ\text{C}$)

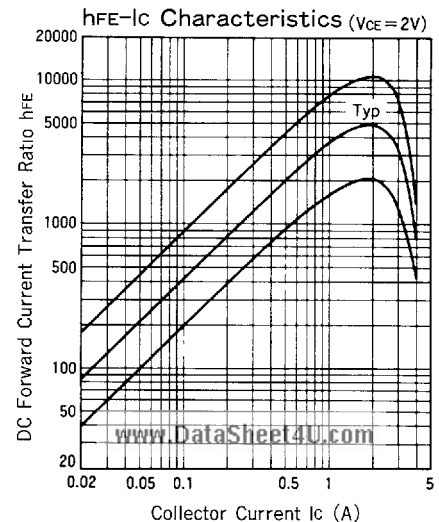
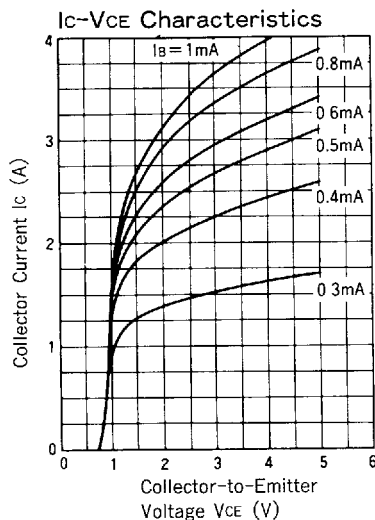
Item	Symbol	Conditions	Specification			Unit
			min	typ	max	
Collector Cut-off Current	I_{CBO}	$V_{CB} = 120\text{V}$			10	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 6\text{V}$			10	mA
Collector-to-Emitter Voltage	V_{CE0}	$I_{CE} = 25\text{mA}$	100			V
DC Forward Current Transfer Ratio	h_{FE}	$V_{CE} = 4\text{V}$, $I_C = 1.5\text{A}$	2000	6000	15000	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1.5\text{A}$, $I_B = 3\text{mA}$		1.1	1.5	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$			1.7	2.0	V

Diode For Fly-Back Voltage Absorption

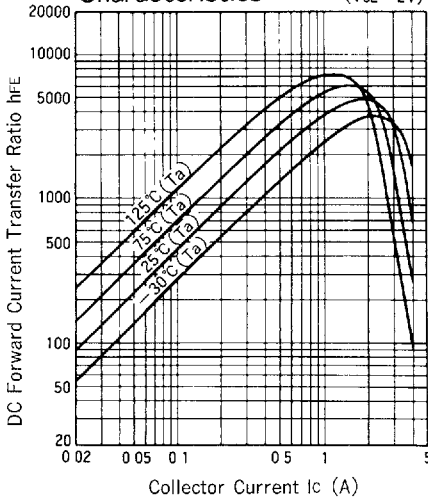
($T_a = 25^\circ\text{C}$)

Reverse Voltage	V_R	$I_R = 10\mu\text{A}$	100			V
Forward Voltage	V_F	$I_F = 1\text{A}$			1.6	V
Reverse Current	I_R	$V_R = 120\text{V}$			10	μA
Reverse Recovery Time	t_{rr}	$I_F = \pm 100\text{mA}$		100		ns

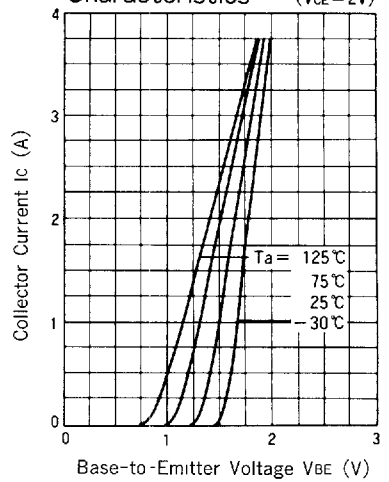
Characteristic Curves



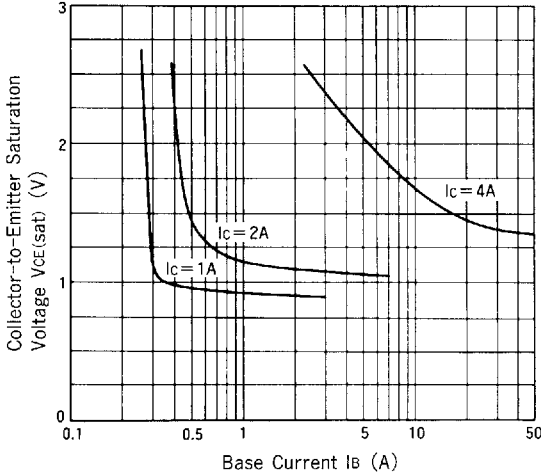
hFE-Ic Temperature Characteristics (V_{CE} = 2V)



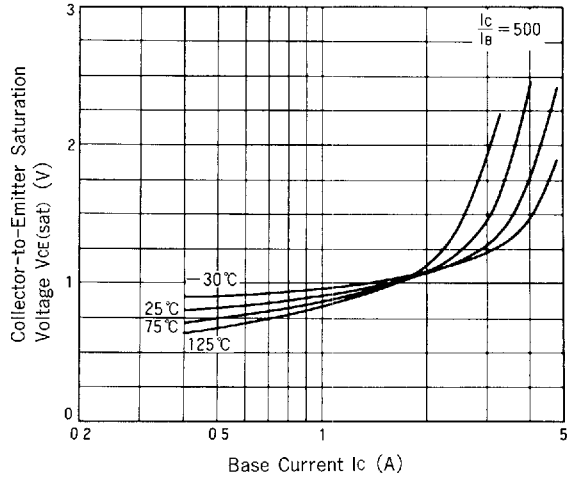
Ic-VBE Temperature Characteristics (V_{CE} = 2V)



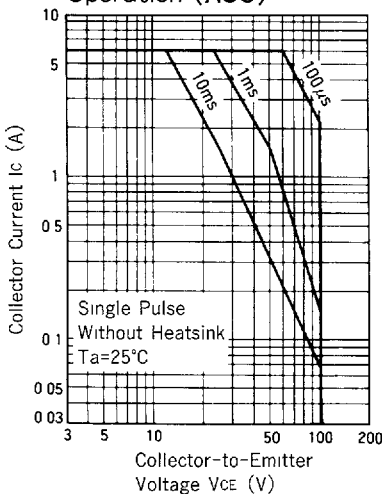
VCE(sat)-Ib Characteristics



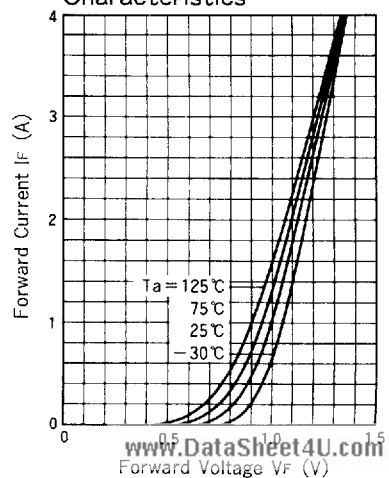
VCE(sat)-Ic Temperature Characteristics



Maximum Area For Safe Operation (ASO)



IF-VF Temperature Characteristics

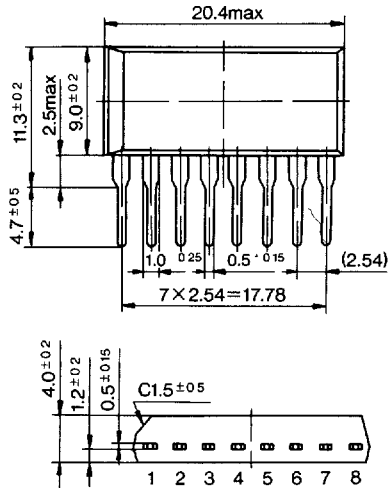


Notes on using products

Outline Drawings (Unit:in mm)

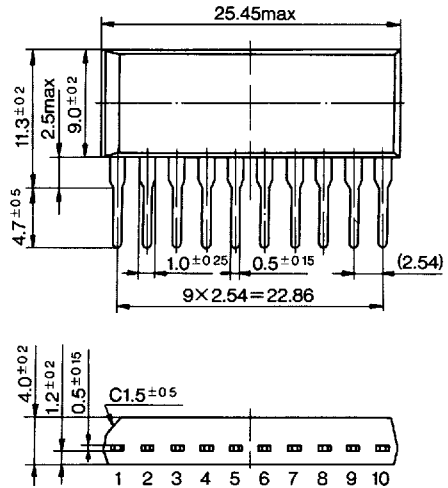
STA Family

STA300 Series



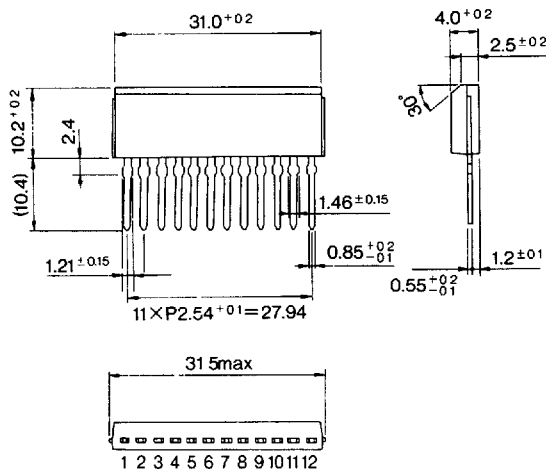
Weight Approx. 2.0g

STA400 Series



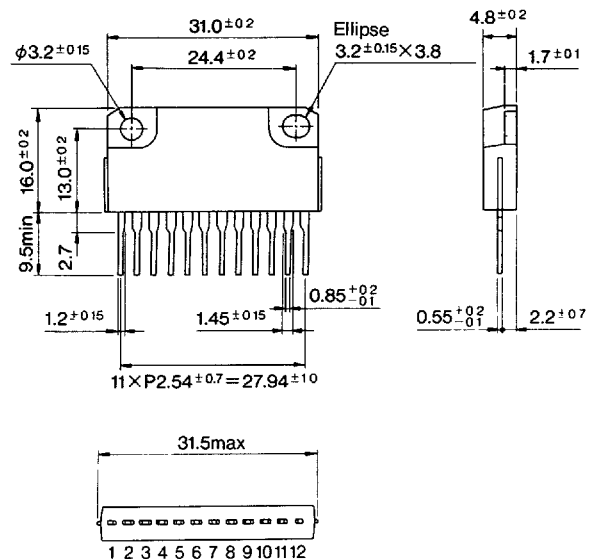
Weight Approx. 2.6g

SMA Family



Weight Approx. 4.0g

SLA Family



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Weight Approx. 6.0g