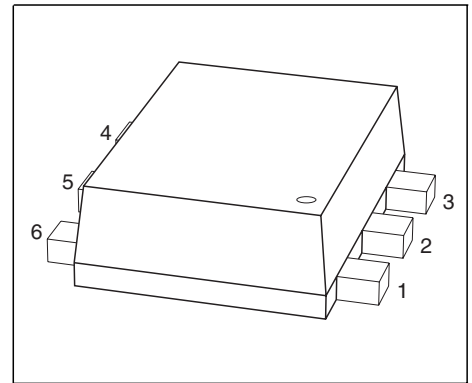


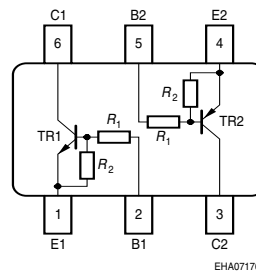
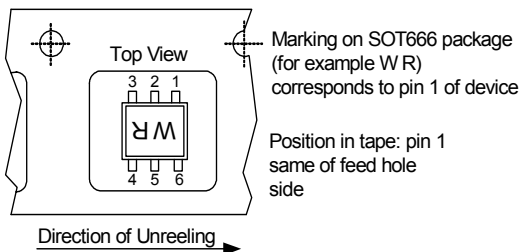
NPN/PNP Silicon Digital Transistor Array

Preliminary data

- Switching circuit, inverter, interface circuit, driver circuit
- Two (galvanic) internal isolated NPN/PNP Transistors in one package
- Built in bias resistor
 NPN: $R_1 = 47k\Omega$, $R_2 = 47k\Omega$
 PNP: $R_1 = 2.2k\Omega$, $R_2 = 47k\Omega$



Tape loading orientation



Type	Marking	Pin Configuration					Package	
SEMD48	WT	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT666

Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-emitter voltage		V_{CEO}	50	V
Collector-base voltage		V_{CBO}	50	
Emitter-base voltage	NPN	V_{EBO}	10	
Emitter-base voltage	PNP	V_{EBO}	5	
Input on voltage	NPN	$V_{i(on)}$	50	
Input on voltage	PNP	$V_{i(on)}$	10	
DC collector current	NPN	I_C	70	mA
DC collector current	PNP	I_C	100	
Total power dissipation, $T_S = 75\text{ }^\circ\text{C}$		P_{tot}	250	mW
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature		T_{stg}	-65...+150	

Thermal Resistance

Junction - soldering point ¹⁾	R_{thJS}	≤ 300	K/W
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Electrical Characteristics at $T_A=25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC Characteristics for NPN Type

Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current $V_{CB} = 40 \text{V}, I_E = 0$	I_{CBO}	-	-	100	nA
Emitter cutoff current $V_{EB} = 10 \text{V}, I_C = 0$	I_{EBO}	-	-	164	μA
DC current gain 2) $I_C = 5 \text{mA}, V_{CE} = 5 \text{V}$	h_{FE}	70	-	-	-
Collector-emitter saturation voltage ²⁾ $I_C = 10 \text{mA}, I_B = 0.5 \text{mA}$	V_{CEsat}	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{V}$	$V_{i(off)}$	0.8	-	1.5	
Input on Voltage $I_C = 2 \text{mA}, V_{CE} = 0.3 \text{V}$	$V_{i(on)}$	1	-	3	
Input resistor	R_1	32	47	62	$\text{k}\Omega$
Resistor ratio	R_1/R_2	0.9	1	1.1	-

AC Characteristics for NPN Type

Transition frequency $I_C = 10 \text{mA}, V_{CE} = 5 \text{V}, f = 100 \text{MHz}$	f_T	-	100	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{V}, f = 1 \text{MHz}$	C_{cb}	-	3	-	pF

¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

²⁾Pulse test: $t < 300\mu\text{s}; D < 2\%$

Electrical Characteristics at $T_A=25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics for PNP Type					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$	I_{CBO}	-	-	100	nA
Emitter cutoff current $V_{EB} = 5 \text{ V}, I_C = 0$	I_{EBO}	-	-	164	μA
DC current gain 1) $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$	h_{FE}	70	-	-	-
Collector-emitter saturation voltage 1) $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$	V_{CEsat}	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	0.4	-	0.8	
Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	0.5	-	1.1	
Input resistor	R_1	1.5	2.2	2.9	$\text{k}\Omega$
Resistor ratio	R_1/R_2	0.042	0.047	0.052	-

AC Characteristics for PNP Type

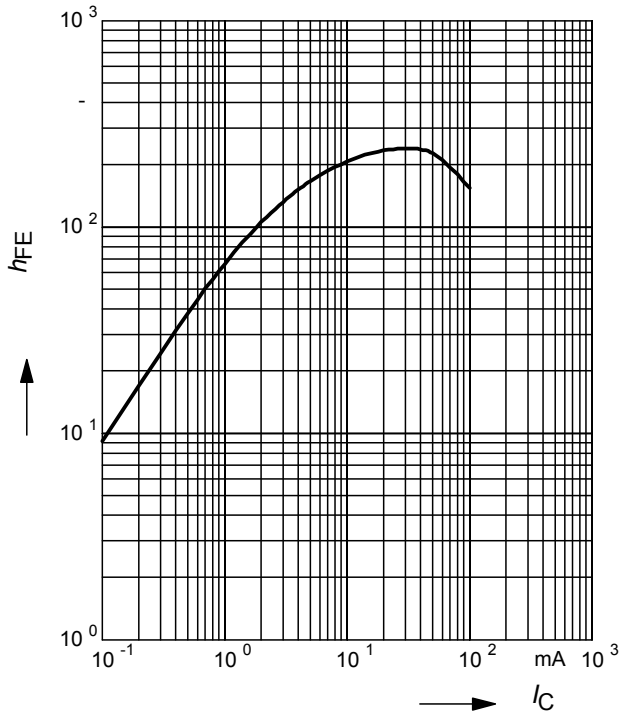
Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	f_T	-	200	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	C_{cb}	-	3	-	pF

 1) Pulse test: $t < 300\mu\text{s}; D < 2\%$

NPN Type

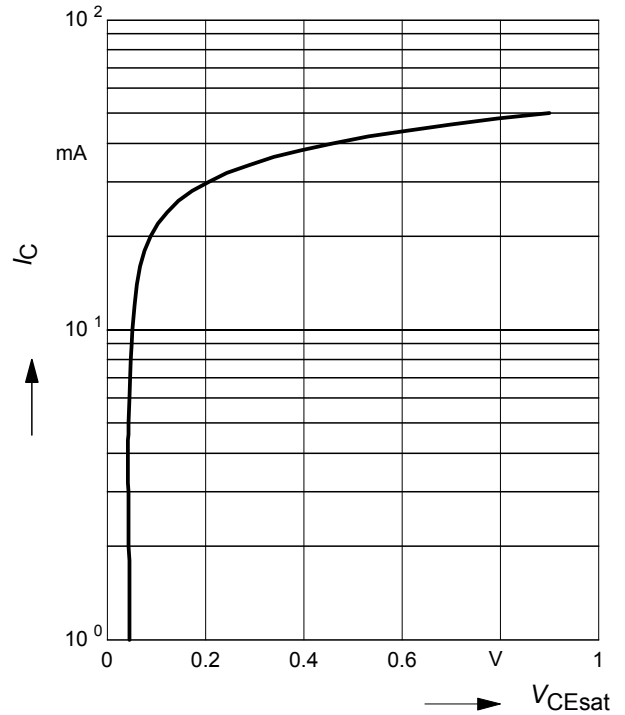
DC Current Gain $h_{FE} = f(I_C)$

$V_{CE} = 5V$ (common emitter configuration)



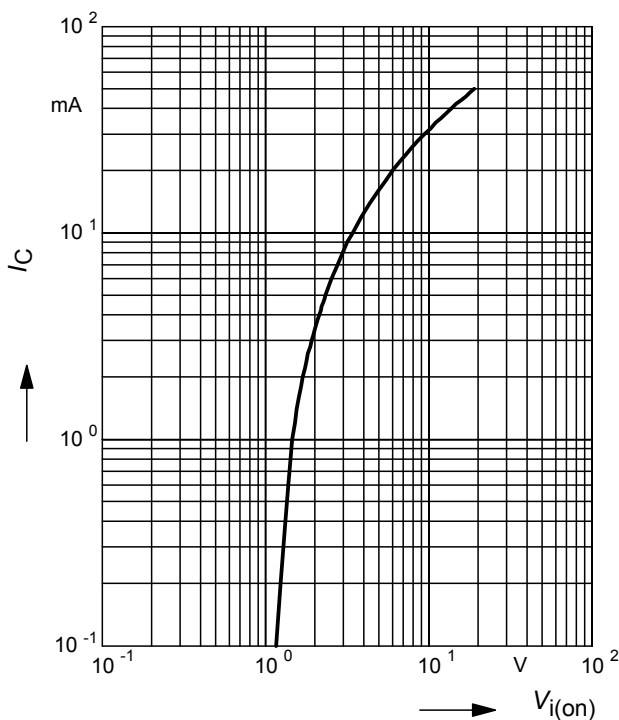
Collector-Emitter Saturation Voltage

$V_{CEsat} = f(I_C), h_{FE} = 20$



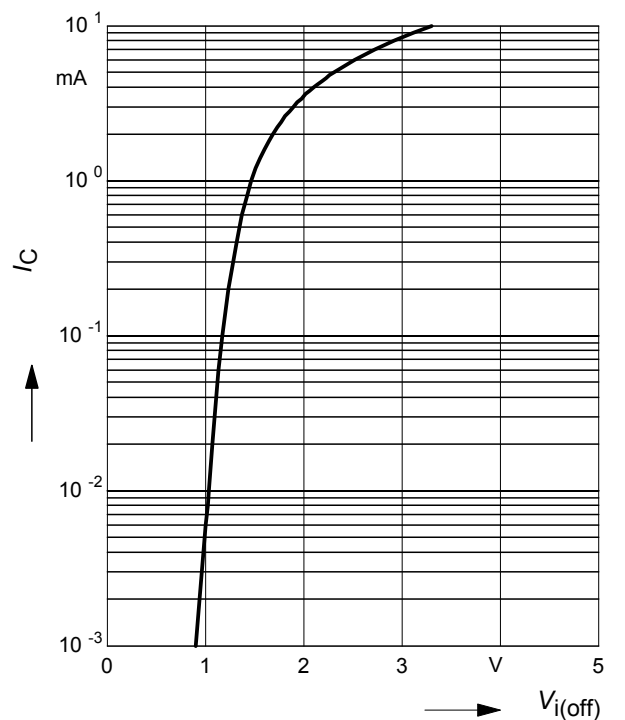
Input on Voltage $V_{i(on)} = f(I_C)$

$V_{CE} = 0.3V$ (common emitter configuration)



Input off voltage $V_{i(off)} = f(I_C)$

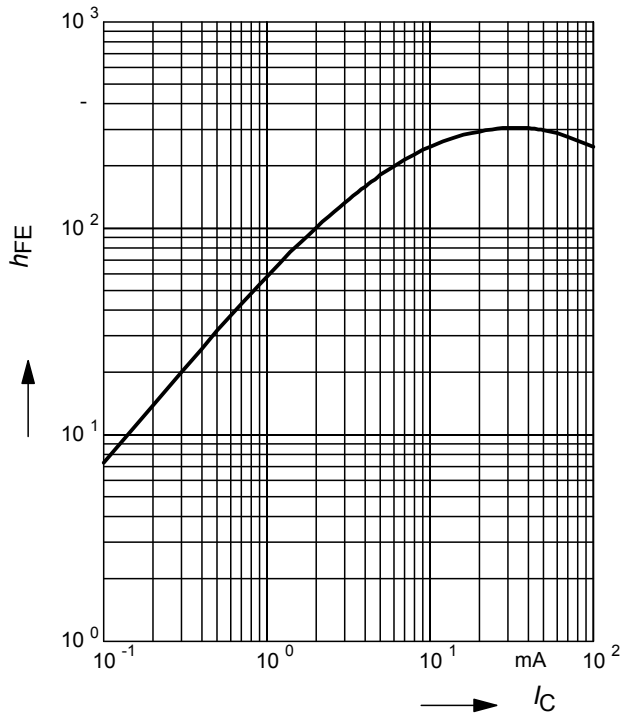
$V_{CE} = 5V$ (common emitter configuration)



PNP Type

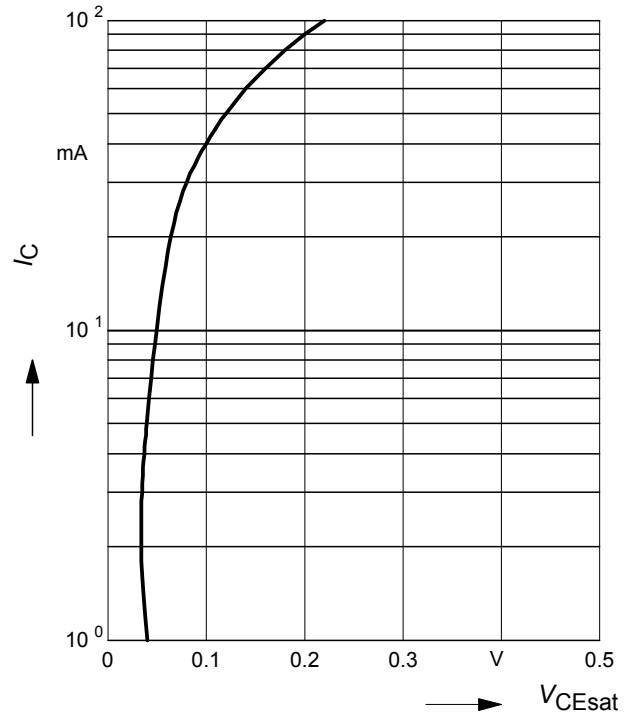
DC Current Gain $h_{FE} = f(I_C)$

$V_{CE} = 5V$ (common emitter configuration)



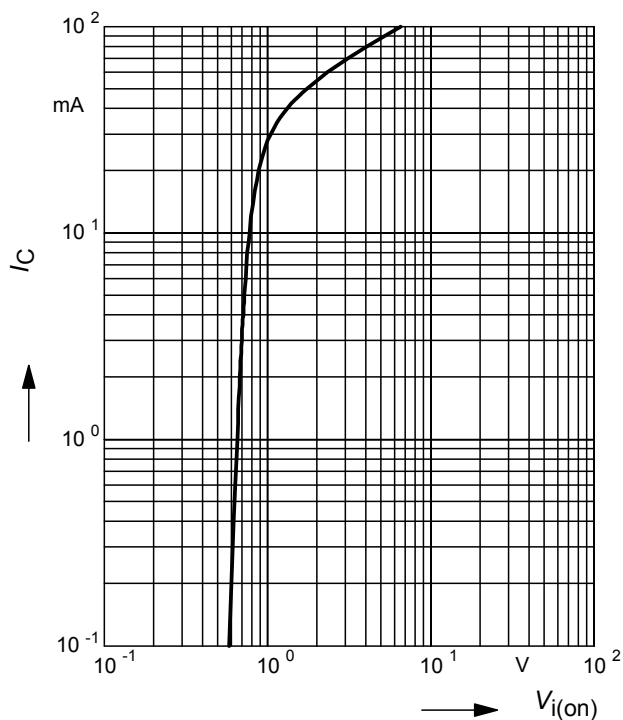
Collector-Emitter Saturation Voltage

$V_{CEsat} = f(I_C), h_{FE} = 20$



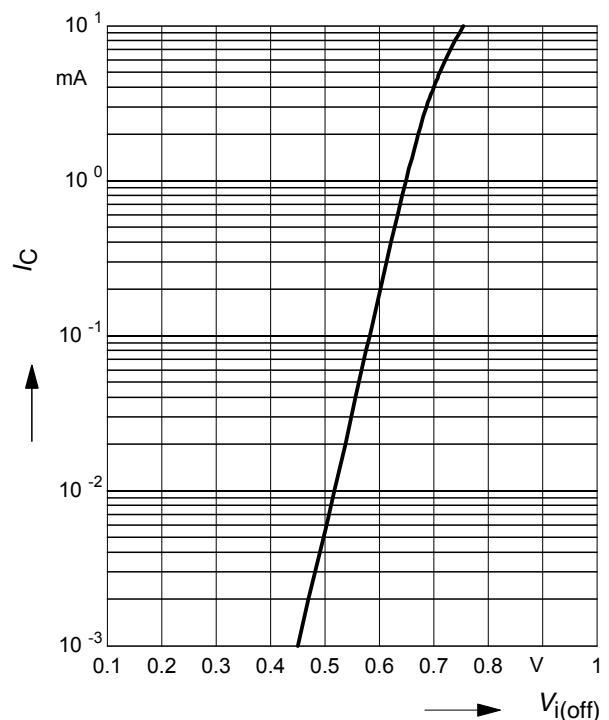
Input on Voltage $V_{i(on)} = f(I_C)$

$V_{CE} = 0.3V$ (common emitter configuration)

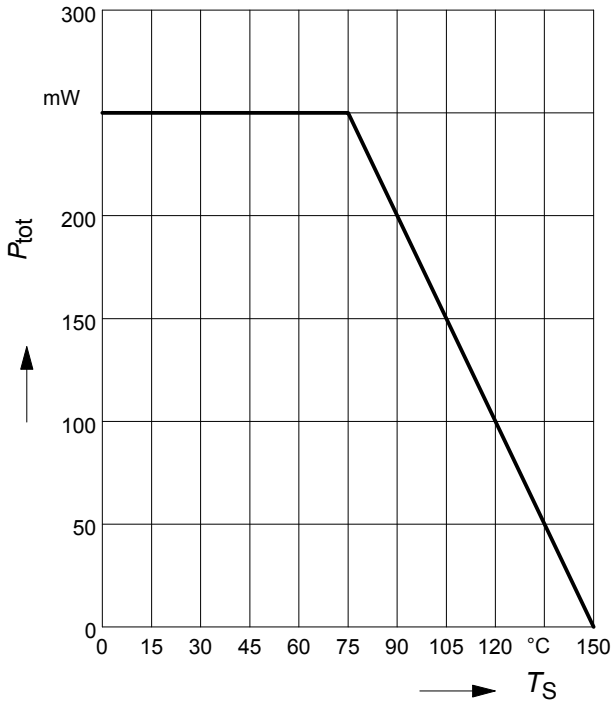


Input off voltage $V_{i(off)} = f(I_C)$

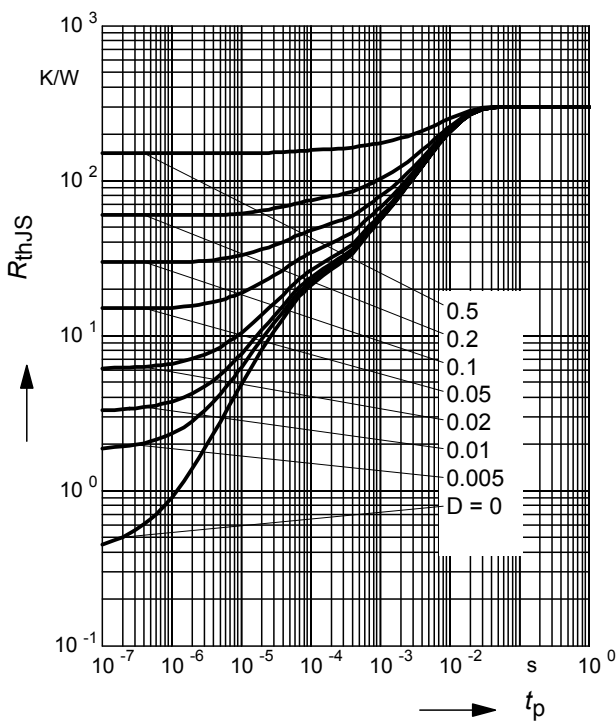
$V_{CE} = 5V$ (common emitter configuration)



Total power dissipation $P_{tot} = f(T_S)$



Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

$P_{totmax} / P_{totDC} = f(t_p)$

