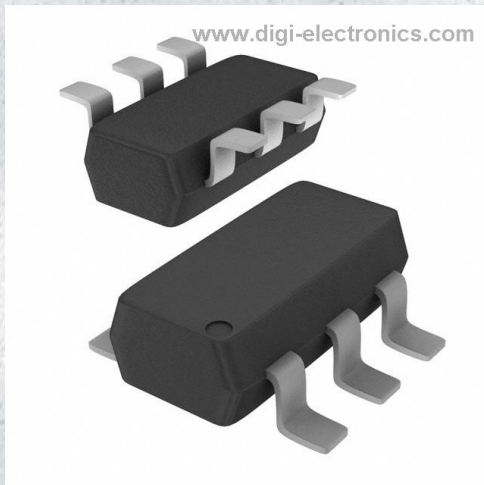


SMBT 3904U E6327 Datasheet



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	SMBT 3904U E6327-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	SMBT 3904U E6327
Description	TRANS 2NPN 40V 0.2A SC74-6
Detailed Description	Bipolar (BJT) Transistor Array 2 NPN (Dual) 40V 200 mA 300MHz 330mW Surface Mount PG-SC74-6



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:

SMBT 3904U E6327

Series:

-

Transistor Type:

2 NPN (Dual)

Voltage - Collector Emitter Breakdown (Max):

40V

Current - Collector Cutoff (Max):

50nA (ICBO)

Power - Max:

330mW

Operating Temperature:

150°C (TJ)

Package / Case:

SC-74, SOT-457

Base Product Number:

SMBT 3904

Manufacturer:

Infineon Technologies

Product Status:

Obsolete

Current - Collector (Ic) (Max):

200mA

Vce Saturation (Max) @ Ib, Ic:

300mV @ 5mA, 50mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

100 @ 10mA, 1V

Frequency - Transition:

300MHz

Mounting Type:

Surface Mount

Supplier Device Package:

PG-SC74-6

Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

REACH Status:

REACH Unaffected

HTSUS:

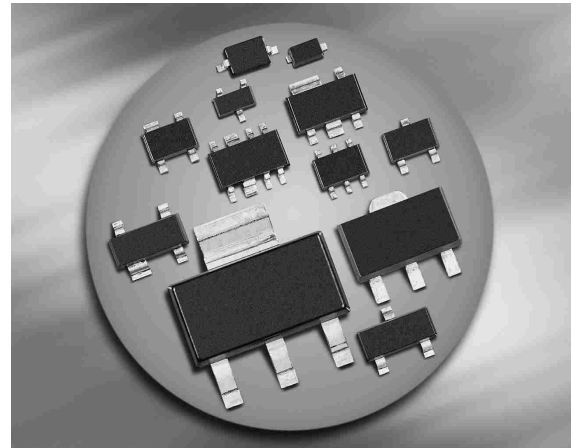
8541.21.0075



SMBT3904...MMBT3904

NPN Silicon Switching Transistors

- High DC current gain: 0.1 mA to 100 mA
- Low collector-emitter saturation voltage
- For SMBT3904S:
 - Two (galvanic) internal isolated transistors with good matching in one package
- Complementary types: SMBT3906... MMBT3906
- SMBT3904S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration						Package
SMBT3904/MMBT3904	s1A	1=B	2=E	3=C	-	-	-	SOT23
SMBT3904S	s1A	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	40	V
Collector-base voltage	V_{CBO}	60	
Emitter-base voltage	V_{EBO}	6	
Collector current	I_C	200	mA
Total power dissipation- $T_S \leq 71^\circ\text{C}$, SOT23, SMBT3904 $T_S \leq 115^\circ\text{C}$, SOT363, SMBT3904S	P_{tot}	330 250	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}		K/W
SMBT3904/MMBT3904		≤ 240	
SMBT3904S		≤ 140	

¹For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)



SMBT3904...MMBT3904

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	40	-	-	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	60	-	-	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	6	-	-	
Collector-base cutoff current $V_{CB} = 30\text{ V}, I_E = 0$	I_{CBO}	-	-	50	nA
DC current gain ¹⁾ $I_C = 100\text{ }\mu\text{A}, V_{CE} = 1\text{ V}$ $I_C = 1\text{ mA}, V_{CE} = 1\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 1\text{ V}$ $I_C = 50\text{ mA}, V_{CE} = 1\text{ V}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$	h_{FE}	40 70 100 60 30	- - - - -	- - 300 - -	-
Collector-emitter saturation voltage ¹⁾ $I_C = 10\text{ mA}, I_B = 1\text{ mA}$ $I_C = 50\text{ mA}, I_B = 5\text{ mA}$	V_{CEsat}	- -	- -	0.2 0.3	V
Base emitter saturation voltage ¹⁾ $I_C = 10\text{ mA}, I_B = 1\text{ mA}$ $I_C = 50\text{ mA}, I_B = 5\text{ mA}$	V_{BEsat}	0.65 -	- -	0.85 0.95	

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



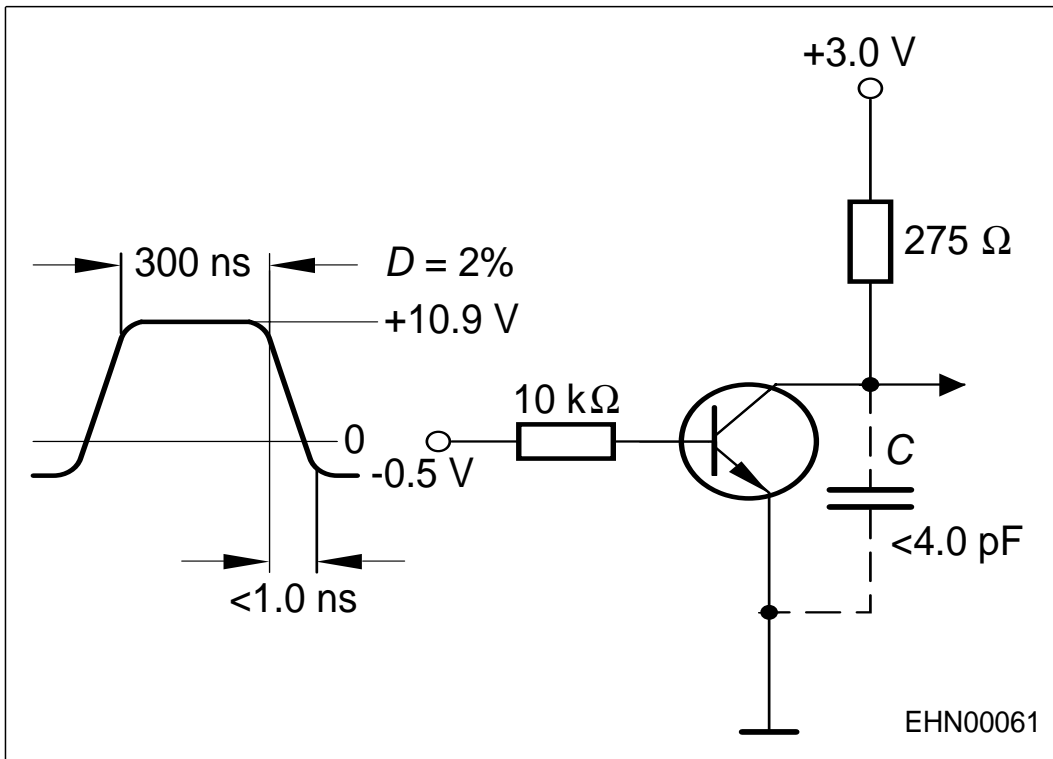
SMBT3904...MMBT3904

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

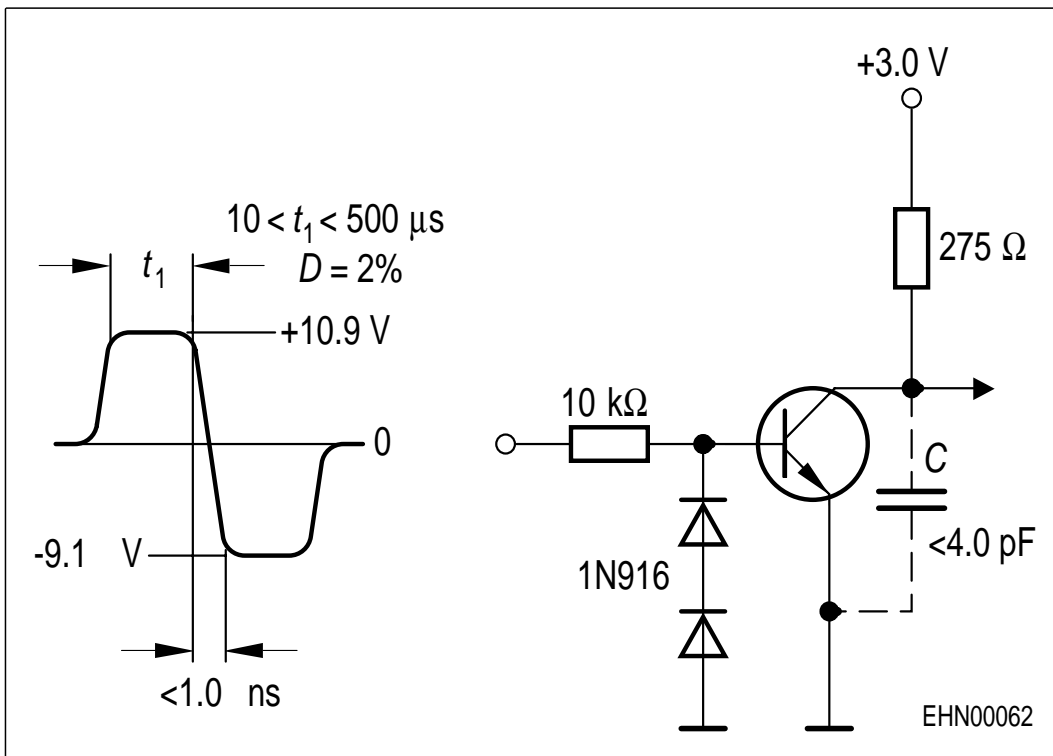
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency $I_C = 10\text{ mA}$, $V_{CE} = 20\text{ V}$, $f = 100\text{ MHz}$	f_T	300	-	-	MHz
Collector-base capacitance $V_{CB} = 5\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	-	3.5	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{eb}	-	-	8	
Delay time $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 1\text{ mA}$, $V_{BE(\text{off})} = 0.5\text{ V}$	t_d	-	-	35	ns
Rise time $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 1\text{ mA}$, $V_{BE(\text{off})} = 0.5\text{ V}$	t_r	-	-	35	
Storage time $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = I_{B2} = 1\text{ mA}$	t_{stg}	-	-	200	
Fall time $V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = I_{B2} = 1\text{ mA}$	t_f	-	-	50	
Noise figure $I_C = 100\text{ }\mu\text{A}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$, $\Delta f = 200\text{ Hz}$, $R_S = 1\text{ k}\Omega$	F	-	-	5	dB

Test circuits

Delay and rise time



Storage and fall time

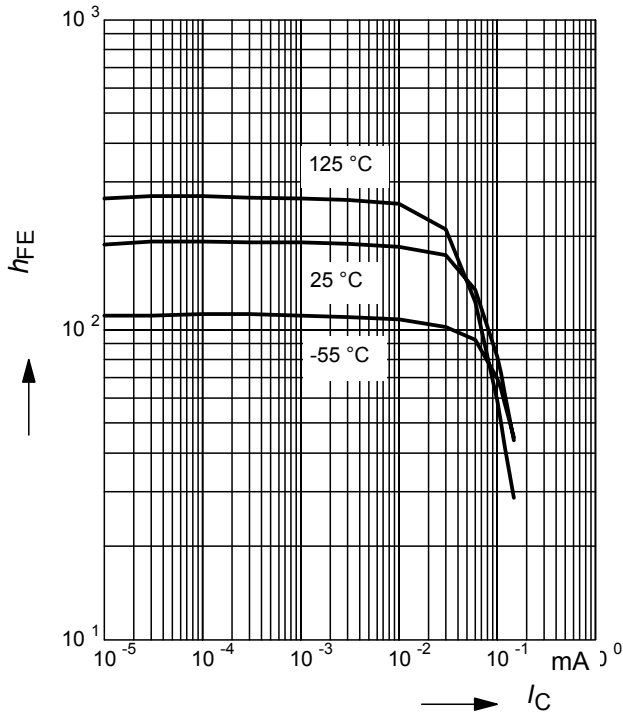




SMBT3904...MMBT3904

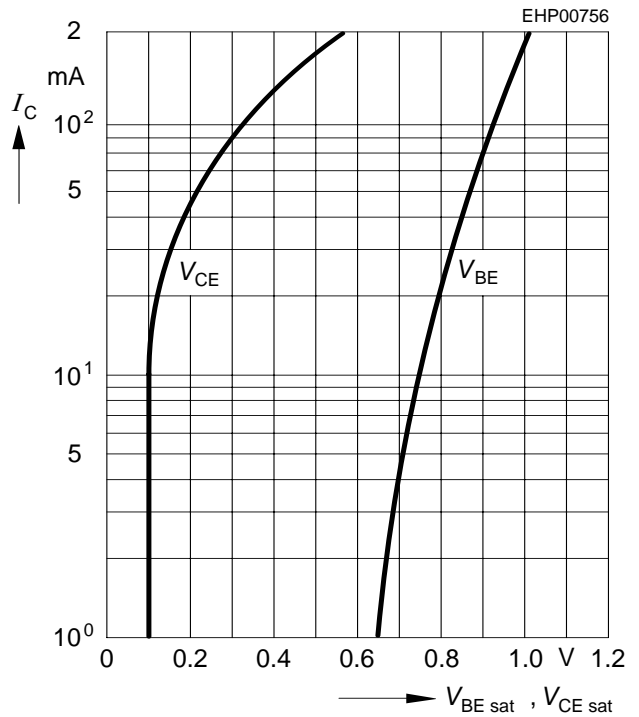
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 1\text{ V}$, normalized



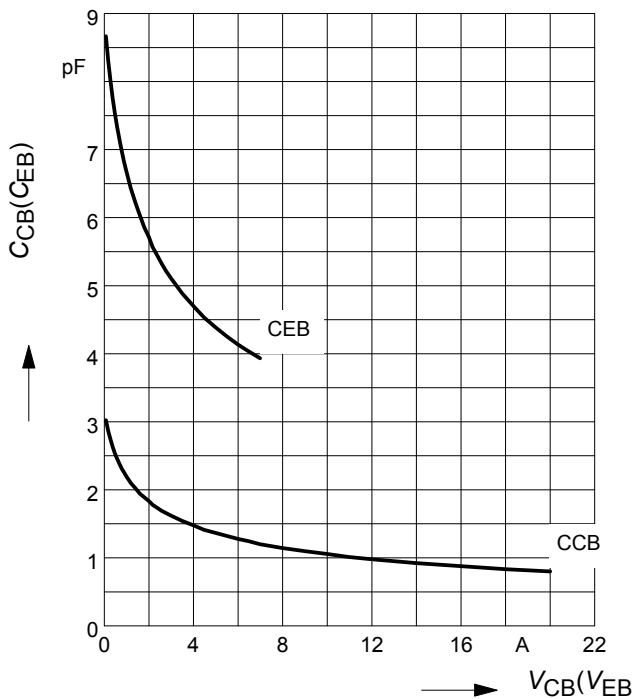
Saturation voltage $I_C = f(V_{BEsat}; V_{CEsat})$

$h_{FE} = 10$



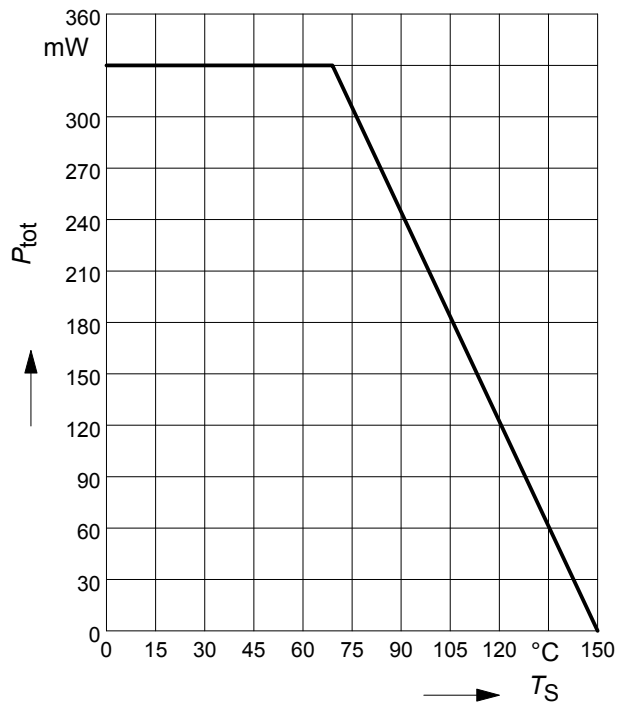
Collector-base capacitance $C_{cb} = f(V_{CB})$

Emitter-base capacitance $C_{eb} = f(V_{EB})$



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

SMBT3904/MMBT3904

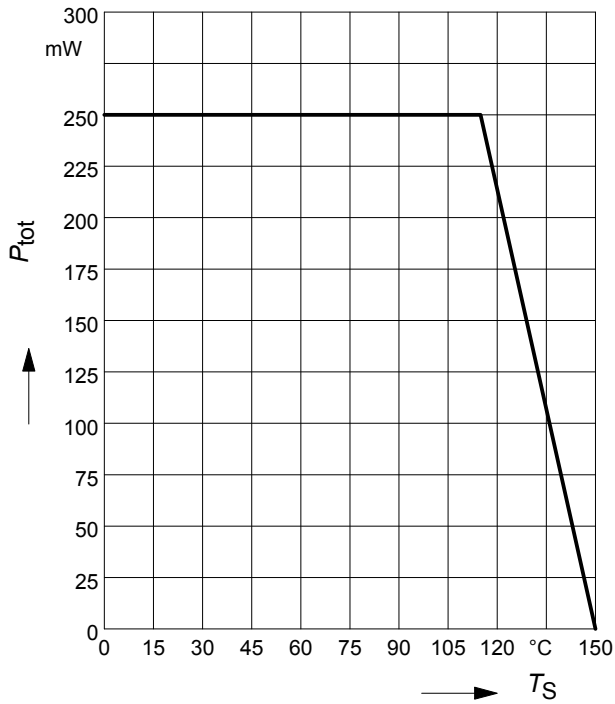




SMBT3904...MMBT3904

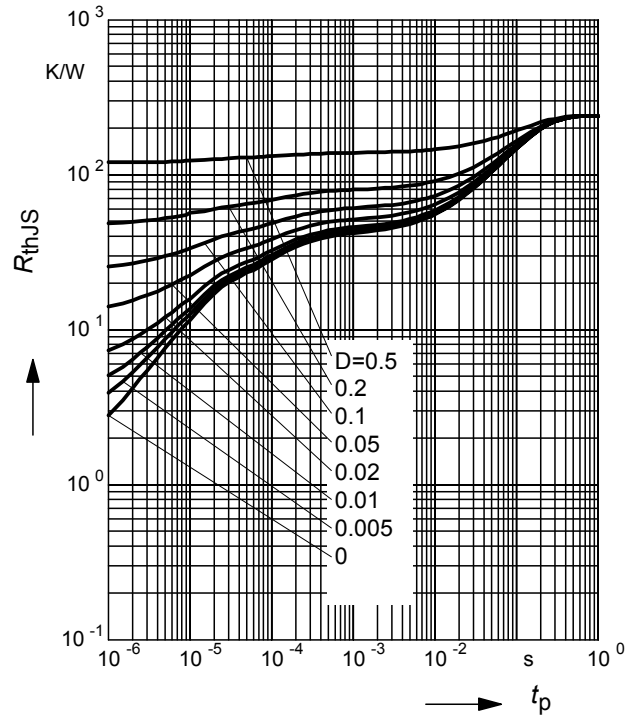
Total power dissipation $P_{tot} = f(T_S)$

SMBT3904S



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

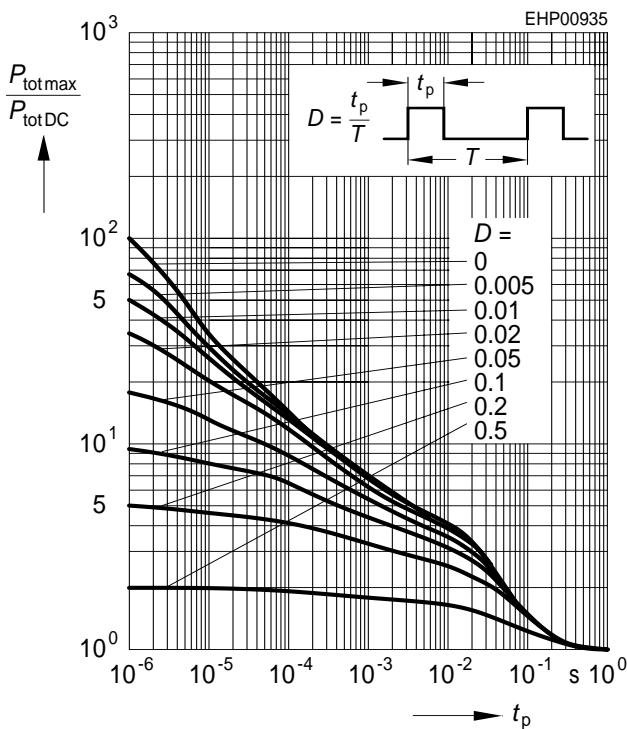
SMBT3904/ MMBT3904



Permissible Pulse Load

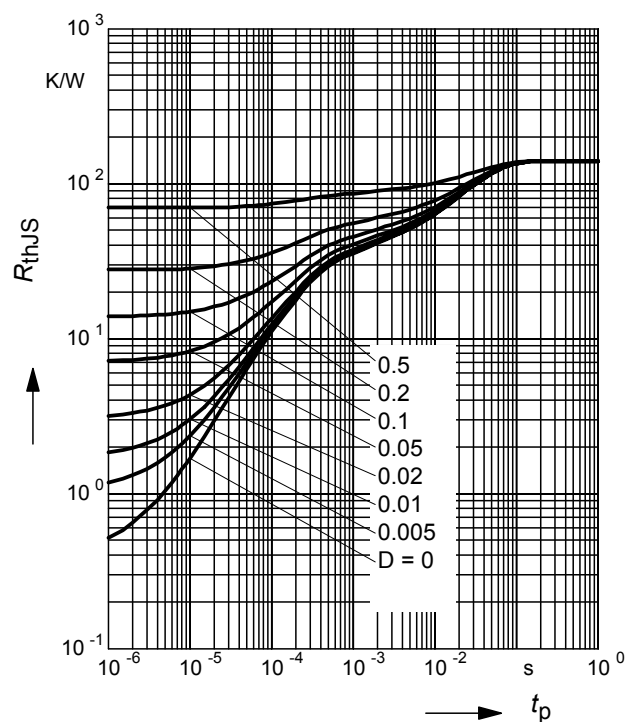
$P_{totmax}/P_{totDC} = f(t_p)$

SMBT3904/MMBT3904



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

SMBT3904S

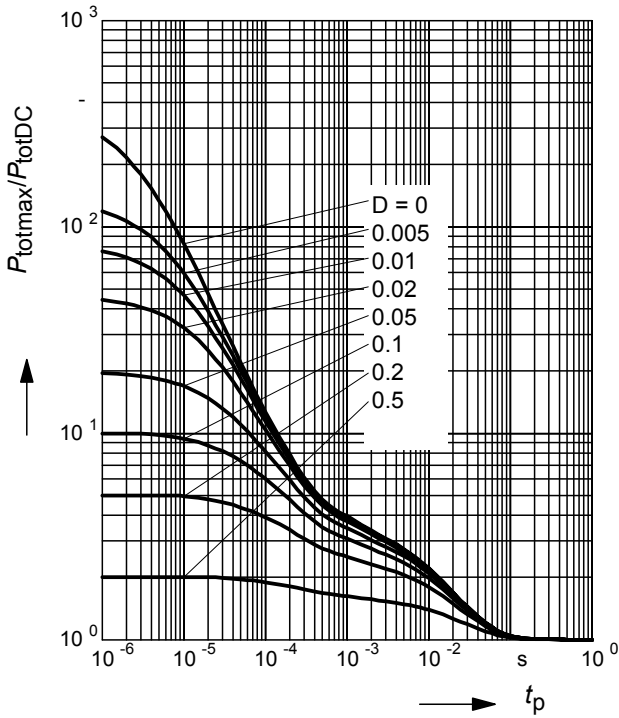




Permissible Pulse Load

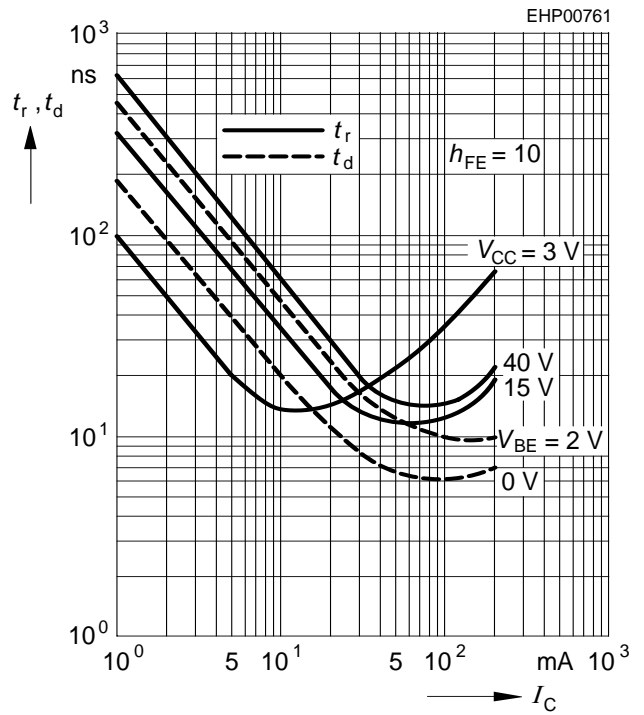
$$P_{totmax}/P_{totDC} = f(t_p)$$

SMBT3904S



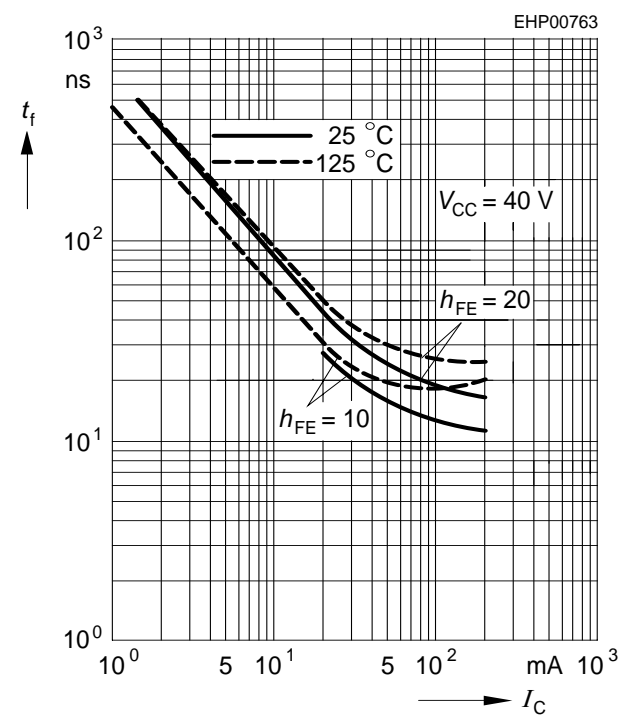
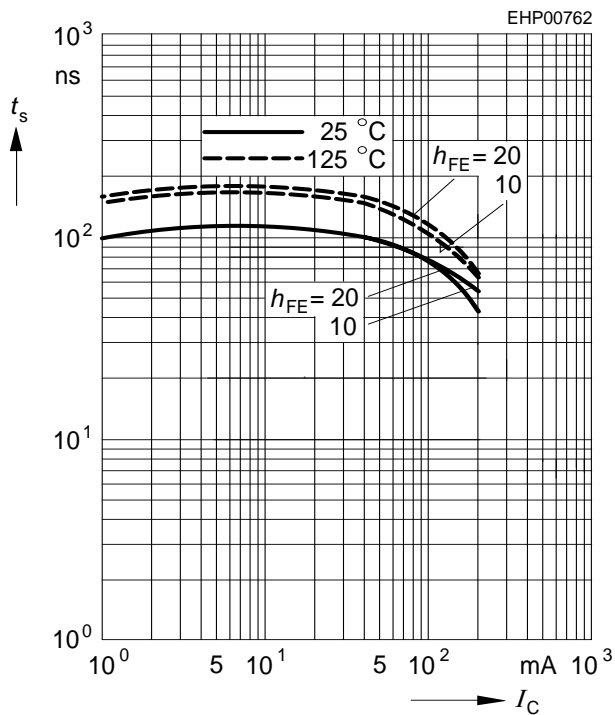
Delay time $t_d = f(I_C)$

Rise time $t_r = f(I_C)$



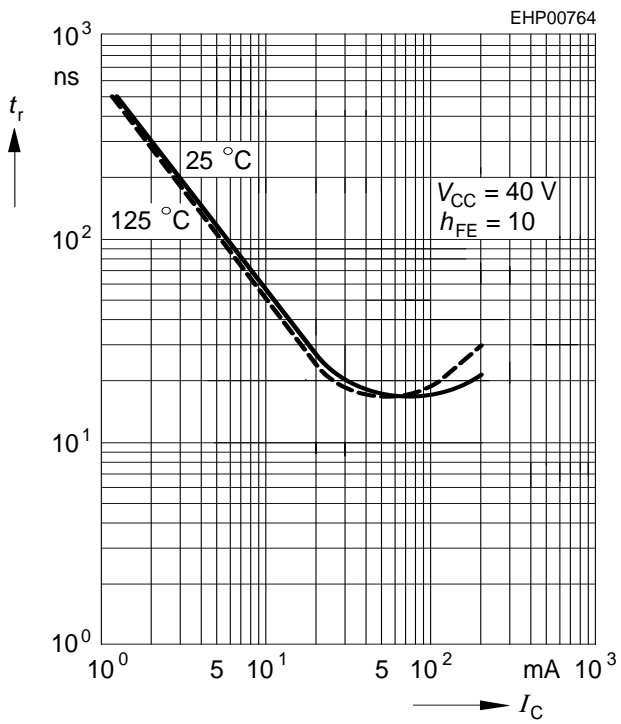
Storage time $t_{stg} = f(I_C)$

Fall time $t_f = f(I_C)$





Rise time $t_r = f(I_C)$

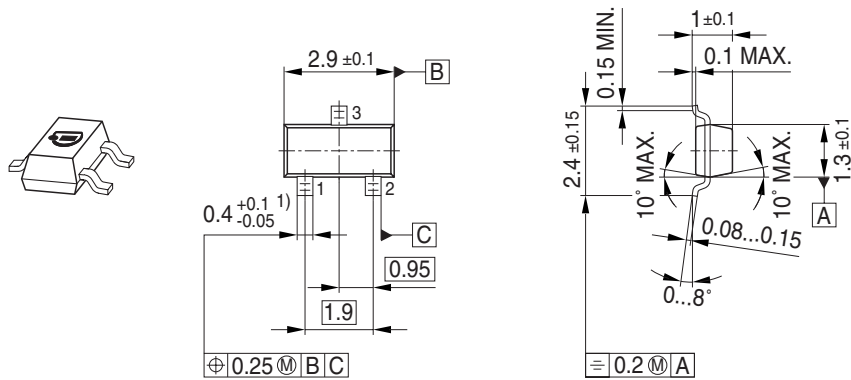




Package SOT23

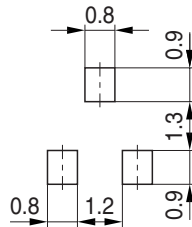
SMBT3904...MMBT3904

Package Outline

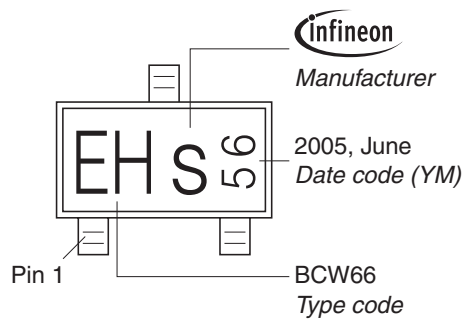


1) Lead width can be 0.6 max. in dambar area

Foot Print

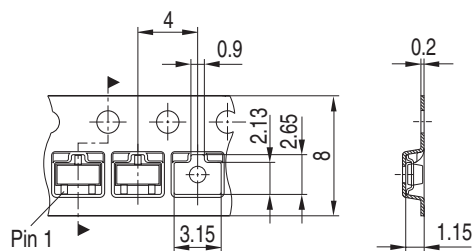


Marking Layout (Example)



Standard Packing

Reel $\varnothing 180$ mm = 3.000 Pieces/Reel
 Reel $\varnothing 330$ mm = 10.000 Pieces/Reel

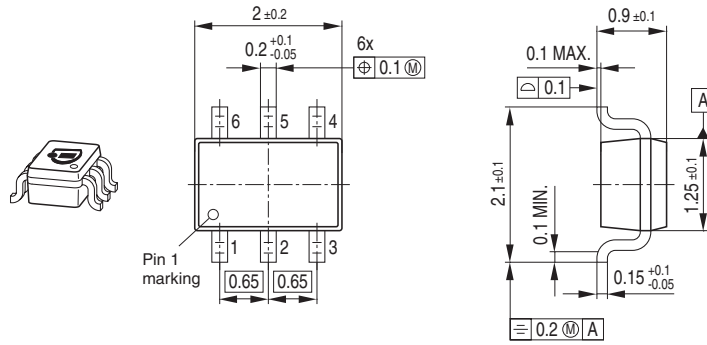




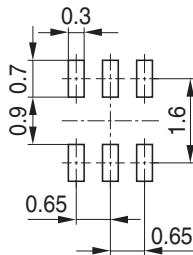
Package SOT363

SMBT3904...MMBT3904

Package Outline

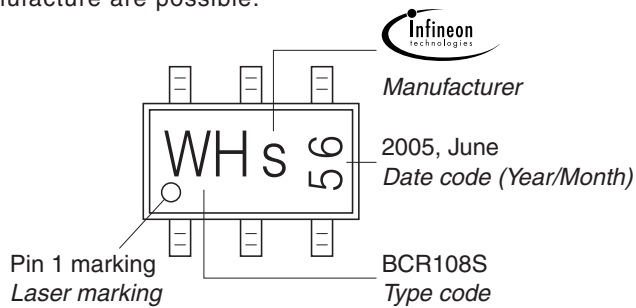


Foot Print



Marking Layout (Example)

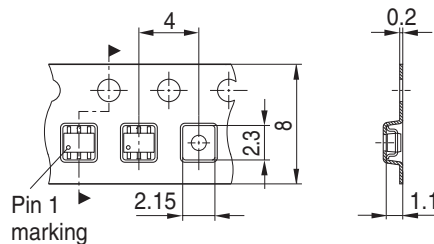
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.





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