

MMBT4330WP

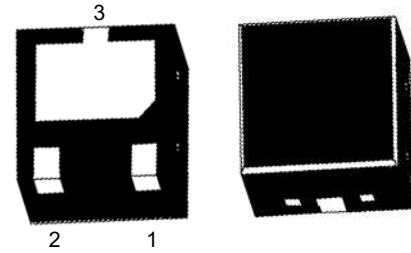
NPN Silicon Epitaxial Planar Transistor

Features

- Low Collector Emitter Saturation voltage $V_{CE(sat)}$
- High Collector Current Capability I_C and I_{CM}

Applications

- Loadswitch
- Battery-driven Devices
- Power Management
- Charging Circuits
- Power Switches (e.g.motors, fans)



1.Base 2.Emitter 3.Collector
DFN2020-3H Plastic Package

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

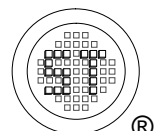
Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	50	V
Collector Emitter Voltage	V_{CEO}	30	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	3	A
Peak Collector Current, Pulsed ($t_p \leq 1 \text{ ms}$)	I_{CM}	5	A
Base Current	I_B	500	mA
Power Dissipation ¹⁾	P_D	500	mW
Power Dissipation ²⁾	P_D	1	W
Power Dissipation ³⁾	P_D	1.25	W
Power Dissipation ⁴⁾	P_D	2.1	W
Thermal Resistance from Junction to Ambient ¹⁾	$R_{\theta JA}$	250	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient ²⁾	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient ³⁾	$R_{\theta JA}$	100	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient ⁴⁾	$R_{\theta JA}$	60	$^\circ\text{C/W}$
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 65 to + 150	$^\circ\text{C}$

¹⁾ Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

²⁾ Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm².

³⁾ Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm².

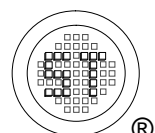
⁴⁾ Device mounted on a ceramic, Al₂O₃, standard footprint.



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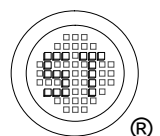
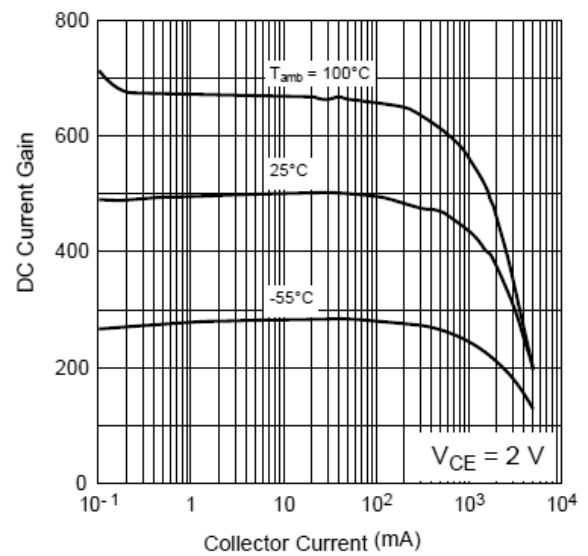
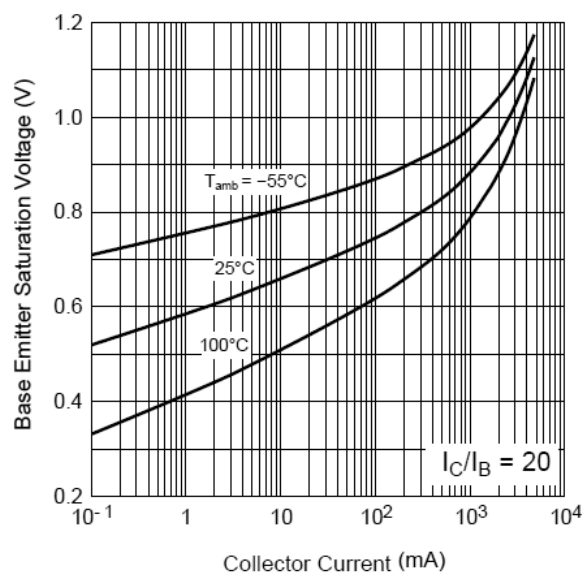
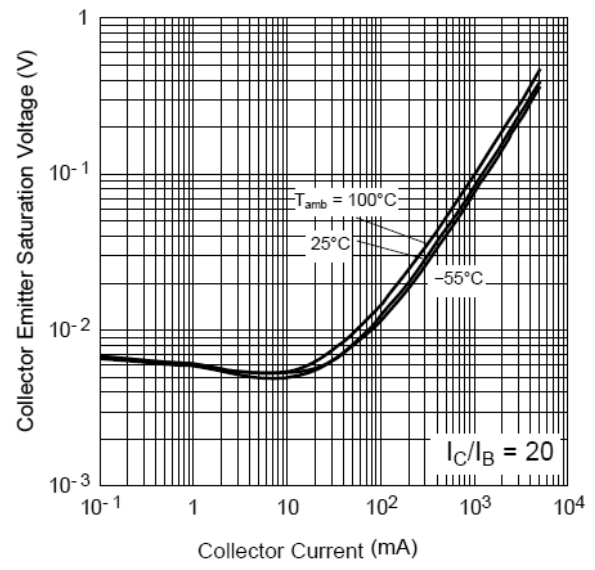
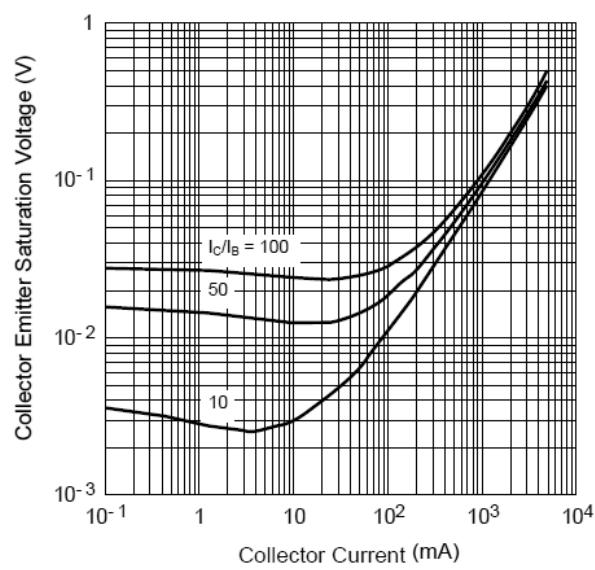
Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 2\text{ V}$, $I_C = 0.5\text{ A}$ at $V_{CE} = 2\text{ V}$, $I_C = 1\text{ A}$ at $V_{CE} = 2\text{ V}$, $I_C = 2\text{ A}$ at $V_{CE} = 2\text{ V}$, $I_C = 3\text{ A}$	h_{FE}	300 270 230 180	- - - -	- 700 - -	- - - -
Collector Base Cutoff Current at $V_{CB} = 30\text{ V}$	I_{CBO}	-	-	100	nA
Collector Emitter Cutoff Current at $V_{CE} = 24\text{ V}$	I_{CEO}	-	-	2	μA
Emitter Base Cutoff Current at $V_{EB} = 5\text{ V}$	I_{EBO}	-	-	100	nA
Collector Emitter Saturation Voltage at $I_C = 0.5\text{ A}$, $I_B = 50\text{ mA}$ at $I_C = 1\text{ A}$, $I_B = 50\text{ mA}$ at $I_C = 2\text{ A}$, $I_B = 100\text{ mA}$ at $I_C = 3\text{ A}$, $I_B = 300\text{ mA}$	$V_{CE(sat)}$	- - - -	- - - -	60 110 220 300	mV
Base Emitter Saturation Voltage at $I_C = 2\text{ A}$, $I_B = 100\text{ mA}$ at $I_C = 3\text{ A}$, $I_B = 300\text{ mA}$	$V_{BE(sat)}$	- -	- -	1.1 1.2	V
Base Emitter Turnon Voltage at $V_{CE} = 2\text{ V}$, $I_C = 1\text{ A}$	$V_{BE(on)}$	-	-	1	V
Delay Time at $V_{CC} = 9\text{ V}$, $I_C = 2\text{ A}$, $I_{B(on)} = -I_{B(off)} = 0.1\text{ A}$	t_d	-	11	-	ns
Rise Time at $V_{CC} = 9\text{ V}$, $I_C = 2\text{ A}$, $I_{B(on)} = -I_{B(off)} = 0.1\text{ A}$	t_r	-	52	-	ns
Turn On Time at $V_{CC} = 9\text{ V}$, $I_C = 2\text{ A}$, $I_{B(on)} = -I_{B(off)} = 0.1\text{ A}$	$t_{(on)}$	-	63	-	ns
Storage Time at $V_{CC} = 9\text{ V}$, $I_C = 2\text{ A}$, $I_{B(on)} = -I_{B(off)} = 0.1\text{ A}$	t_{stg}	-	230	-	ns
Fall Time at $V_{CC} = 9\text{ V}$, $I_C = 2\text{ A}$, $I_{B(on)} = -I_{B(off)} = 0.1\text{ A}$	t_f	-	40	-	ns
Turn Off Time at $V_{CC} = 9\text{ V}$, $I_C = 2\text{ A}$, $I_{B(on)} = -I_{B(off)} = 0.1\text{ A}$	$t_{(off)}$	-	270	-	ns



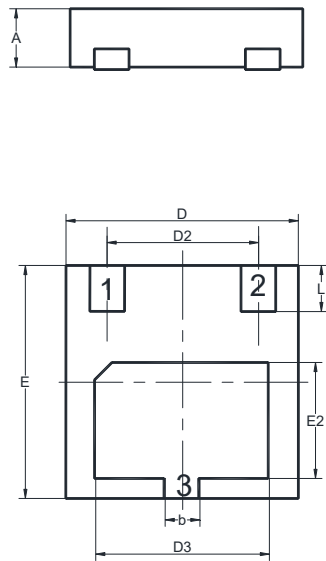
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Electrical Characteristics Curves



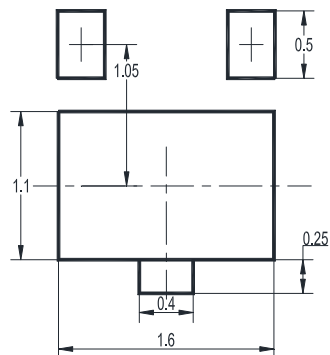
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DFN2020-3H Package Outline Dimensions (Units: mm)



UNIT	A	b	L	D	D2	D3	E	E2
mm	0.54 0.46	0.35 0.25	0.45 0.35	2.1 1.9	1.3	1.6 1.4	2.1 1.9	1.1 0.9

Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
DFN2020-3H	8	4 ± 0.1	0.157 ± 0.004	178	7	4,000

Marking information

" DC " = Part No.

" YYWW " = Date Code Marking

" Y " = Year (ex: 19 = 2019)

" W " = Week (ex: 09 = the 9th week of the year)

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