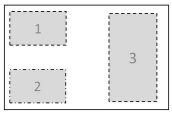
General Purpose Transistors NPN Silicon

DFN1006-3L

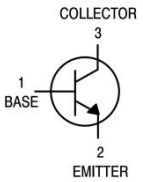
Features and benefits

- Complementary to MBT3906N3
- Small package saves board space

Schematic & Pin configuration



top view



Ordering information

Device	Marking	Shipping
MBT3904D3	1N	8000/Tape & Reel

Maximum Ratings (T_A = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	0.2	A
Power Dissipation	P_C	0.1	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	1250	°C/W
Junction temperature	T_j	125	°C
Storage temperature	T_{stg}	-50 to +150	°C

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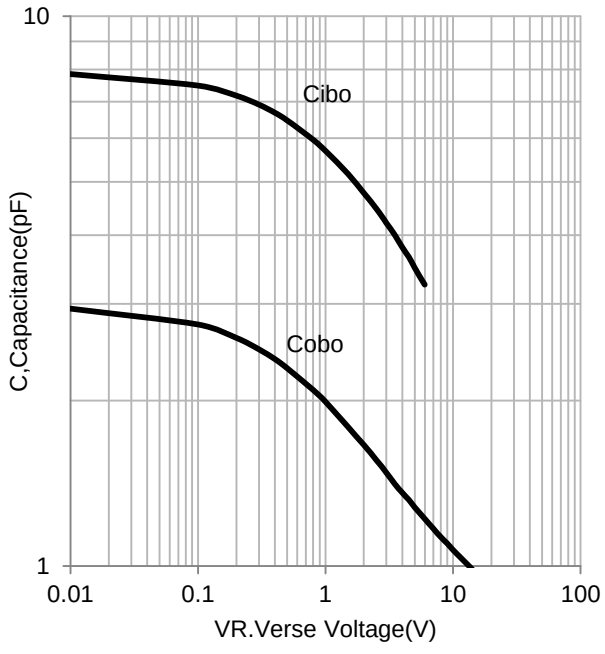
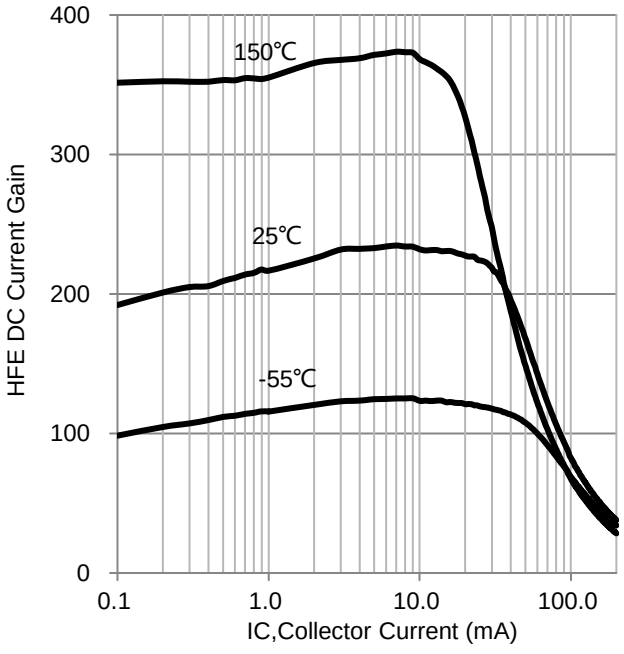
Electrical Characteristics (T_A = 25 °C, unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=10μA,IE=0	60			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	I_C=1mA,IB=0	40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E=10μA,IC=0	6			V
Collector cut-off current	I_{CEX}	V_{CE}=30V,$V_{EB(off)}$=3V			50	nA
Emitter cut-off current	I_{EBO}	V_{EB}=5V,I_C=0			100	nA
DC current gain	$h_{FE(1)}$	V_{CE}=1V,I_C=0.1mA	40			
	$h_{FE(2)}$	V_{CE}=1V,I_C=1mA	70			
	$h_{FE(3)}$	V_{CE}=1V,I_C=10mA	100		300	
	$h_{FE(4)}$	V_{CE}=1V,I_C=50mA	60			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	I_C=10mA,I_B=1mA			0.2	V
	$V_{CE(sat)2}$	I_C=50mA,I_B=5mA			0.3	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	I_C=10mA,I_B=1mA	0.65		0.85	V
	$V_{BE(sat)2}$	I_C=50mA,I_B=5mA			0.95	V
Transition frequency	f_T	V_{CE}=20V,I_C=10mA,f=100MHz	300			MHz
Output capacitance	C_{ob}	V_{CB}=5V,I_E=0,f=1MHz			4	pF
Input capacitance	C_{ib}	V_{EB}=0.5V,I_C=0,f=1MHz			8	pF
Noise figure	NF	V_{CE}=5V,I_C=0.1mA,f=1MHz,R_S=1k			5	dB
Delay time	t_d	V_{CC}=3V,$V_{BE(off)}$=-0.5V,			35	ns
Rise time	t_r	I_C=10mA,I_{B1}=1mA			35	ns
Storage	t_s	V_{CC}=3V,I_C=10mA,			200	ns
Fall time	t_f	I_{B1}=I_{B2}=1mA			50	ns

Electrical Characteristic Curves



Capacitance



DC Current Gain

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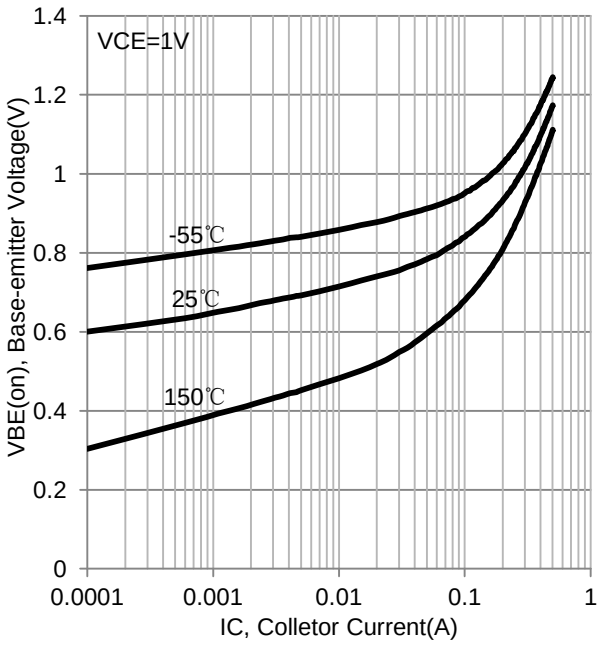
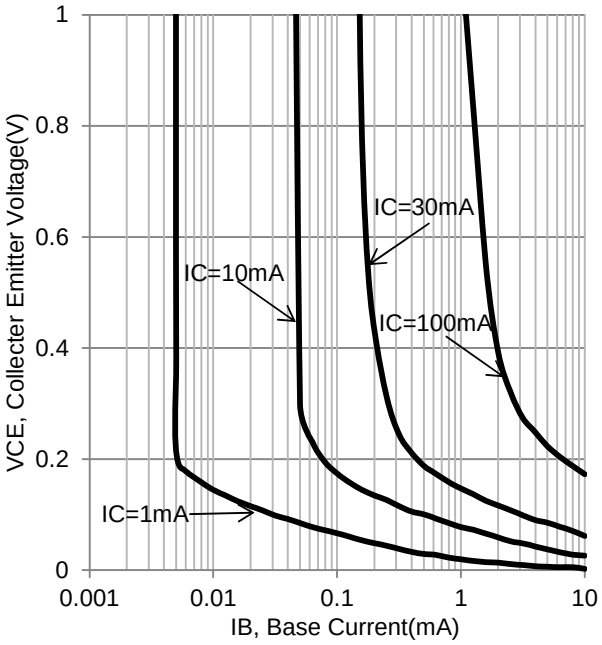


VBE(on) vs. IC



Collector Saturation Region

Package Outline Dimensions

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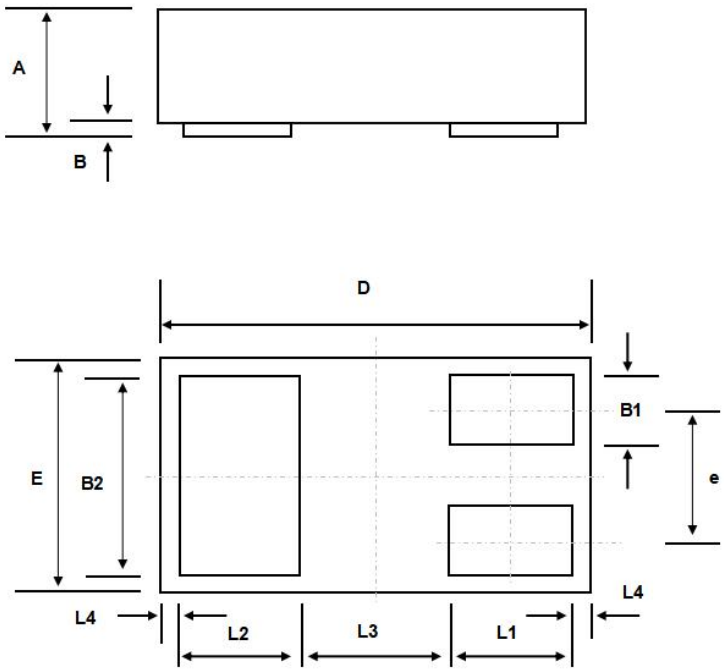
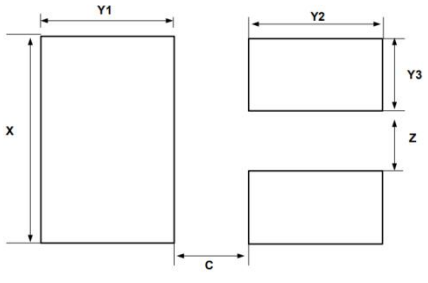


Symbol	Dimensions In Millimet	
	Min	Max
A	0.33	0.50
B	0.00	0.05
B1	0.10	0.20
B2	0.45	0.55
D	0.90	1.05
E	0.50	0.65
e	0.35	
L1	0.20	0.30
L2	0.20	0.30
L3	0.39	
L4	0.05	

Suggested Pad Layout (mm)



Symbol	Dimensions
C	0.25
X	0.65
Y1	0.50
Y2	0.50
Y3	0.25
Z	0.20