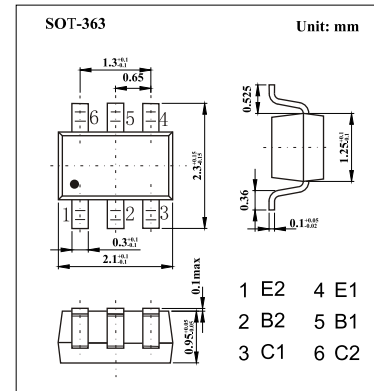
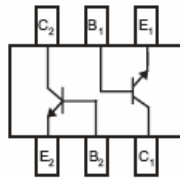


NPN Transistors

MMDT3904 (KMDT3904)

■ Features

- Epitaxial planar die construction
- Ideal for low power amplification and switching
- Dual NPN Transistors



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

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CB0}	60	V
Collector - Emitter Voltage	V_{CE0}	40	
Emitter - Base Voltage	V_{EB0}	5	
Collector Current - Continuous	I_C	200	mA
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature range	T_{stg}	-55 to 150	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CB0}	$I_C = 100 \mu\text{A}$, $I_E = 0$	60			V
Collector- emitter breakdown voltage	V_{CE0}	$I_C = 1 \text{ mA}$, $I_B = 0$	40			
Emitter - base breakdown voltage	V_{EB0}	$I_E = 100 \mu\text{A}$, $I_C = 0$	5			
Collector-base cut-off current	I_{CBO}	$V_{CB} = 60 \text{ V}$, $I_E = 0$			50	nA
Collector- emitter cut-off current	I_{CEX}	$V_{CE} = 30 \text{ V}$, $V_{EB(OFF)} = -3 \text{ V}$			50	
Emitter cut-off current	I_{EBO}	$V_{EB} = 5 \text{ V}$, $I_C = 0$			50	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10 \text{ mA}$, $I_B = 1 \text{ mA}$			0.2	V
		$I_C = 50 \text{ mA}$, $I_B = 5 \text{ mA}$			0.3	
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 10 \text{ mA}$, $I_B = 1 \text{ mA}$	0.65		0.85	V
		$I_C = 50 \text{ mA}$, $I_B = 5 \text{ mA}$			0.95	
DC current gain	$h_{FE(1)}$	$V_{CE} = 1 \text{ V}$, $I_C = 0.1 \text{ mA}$	40			
	$h_{FE(2)}$	$V_{CE} = 1 \text{ V}$, $I_C = 10 \text{ mA}$	100		300	
	$h_{FE(3)}$	$V_{CE} = 1 \text{ V}$, $I_C = 50 \text{ mA}$	60			
Delay time	t_d	$V_{CC} = 3 \text{ V}$, $V_{BE} = -0.5 \text{ V}$			35	ns
Rise time	t_r	$I_C = 10 \text{ mA}$, $I_{B1} = -I_{B2} = 1 \text{ mA}$			35	
Storage time	t_s	$V_{CC} = 3 \text{ V}$, $I_C = 10 \text{ mA}$, $I_{B1} = -I_{B2} = 1 \text{ mA}$			200	
Fall time	t_f				50	
Noise figure	NF	$V_{CE} = 5 \text{ V}$, $I_C = 0.1 \text{ mA}$, $f = 1 \text{ KHz}$, $R_s = 1 \text{ K}\Omega$			5	dB
Collector output capacitance	C_{ob}	$V_{CB} = 5 \text{ V}$, $I_E = 0$, $f = 1 \text{ MHz}$, $f = 100 \text{ MHz}$			4	pF
Transition frequency	f_T	$V_{CE} = 20 \text{ V}$, $I_C = 10 \text{ mA}$, $f = 100 \text{ MHz}$	300			MHz

■ Marking

Marking	K6N
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