

SILICON TRANSISTOR

NTM2222A

GENERAL PURPOSE AMPLIFIER, HIGH SPEED SWITCHING

NPN SILICON EPITAXIAL TRANSISTOR

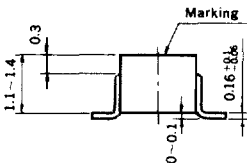
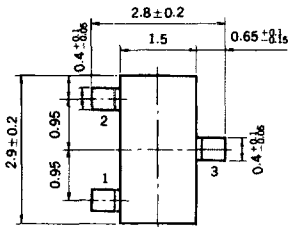
MINI MOLD

DESCRIPTION

The NTM2222A is designed for general purpose amplifier and high speed switching applications, especially Hybrid Integrated Circuit.

PACKAGE DIMENSIONS

in millimeters



1. Emitter
2. Base
3. Collector

Marking B15

FEATURES

- Complementary to NTM2907A.
- High gain bandwidth product : $f_T = 300$ MHz MIN.
- Low collector saturation voltage :
 $V_{CE(sat)} = 0.3$ V MAX. ($I_C = 150$ mA, $I_B = 15$ mA)
- High speed switching times.
- Electrically similar to 2N2222A.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Maximum Voltages and Current

Collector to Base Voltage	V_{CBO}	75	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to Base Voltage	V_{EBO}	6.0	V
Collector Current (DC)	I_C	800	mA

Maximum Power Dissipation

Total Power Dissipation	P_T	200	mW
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Maximum Temperatures

Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT	TEST CONDITIONS
Collector-Base Breakdown Voltage	BV_{CBO}	75		V	$I_C = 10\ \mu\text{A}$, $I_E = 0$
Collector-Emitter Breakdown Voltage	BV_{CEO}	40		V	$I_C = 10\ \text{mA}$, $I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0		V	$I_E = -10\ \mu\text{A}$, $I_C = 0$
Collector Cutoff Current	I_{CEX}		10	nA	$V_{CE} = 60\ \text{V}$, $V_{BE} = -3.0\ \text{V}$
	I_{CBO}		10	nA	$V_{CB} = 60\ \text{V}$, $I_E = 0$
DC Current Gain	h_{FE1}	35			$V_{CE} = 10\ \text{V}$, $I_C = 100\ \mu\text{A}$
	h_{FE2}	50			$V_{CE} = 10\ \text{V}$, $I_C = 1.0\ \text{mA}$
	h_{FE3}	75			$V_{CE} = 10\ \text{V}$, $I_C = 10\ \text{mA}$
	h_{FE4}	100	300		$V_{CE} = 10\ \text{V}$, $I_C = 150\ \text{mA}$ *1
	h_{FE5}	40			$V_{CE} = 10\ \text{V}$, $I_C = 500\ \text{mA}$ *1
Collector Saturation Voltage	$V_{CE(sat)1}$		0.3	V	$I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$ *1
	$V_{CE(sat)2}$		1.0	V	$I_C = 500\ \text{mA}$, $I_B = 50\ \text{mA}$ *1
Base Saturation Voltage	$V_{BE(sat)1}$	0.6	1.2	V	$I_C = 150\ \text{mA}$, $I_B = 15\ \text{mA}$ *1
	$V_{BE(sat)2}$		2.0	V	$I_C = 500\ \text{mA}$, $I_B = 50\ \text{mA}$ *1
Gain Bandwidth Product	f_T	300		MHz	$V_{CE} = 20\ \text{V}$, $I_C = 20\ \text{mA}$, $f = 100\ \text{MHz}$
Output Capacitance	C_{ob}		8.0	pF	$V_{CB} = 10\ \text{V}$, $I_E = 0$, $f = 1.0\ \text{MHz}$
Input Capacitance	C_{ib}		25	pF	$V_{EB} = 0.5\ \text{V}$, $I_C = 0$, $f = 1.0\ \text{MHz}$

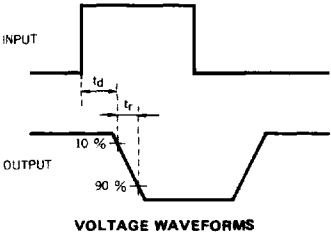
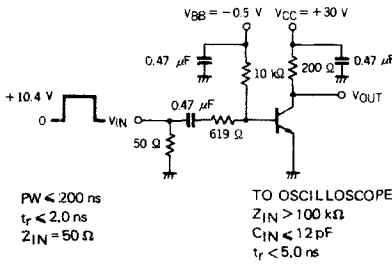
*1 These parameters must be measured by pulse techniques.
 $PW \leq 350\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

SWITCHING CHARACTERISTICS

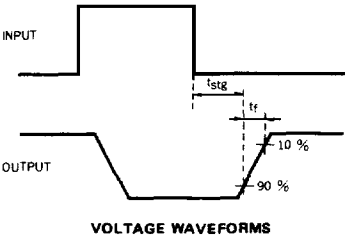
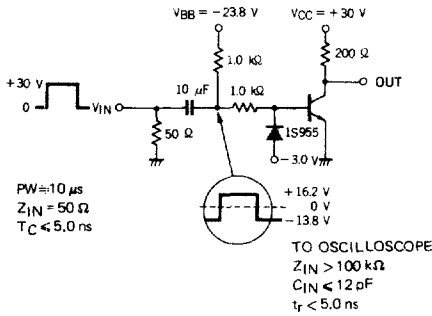
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT	TEST CONDITIONS
Delay Time	t_d		10	ns	$V_{CC}=30\text{ V}$, $V_{BE}=-0.5\text{ V}$ $I_C=150\text{ mA}$, $I_{B1}=15\text{ mA}$
Rise Time	t_r		25	ns	
Storage Time	t_{stg}		225	ns	$V_{CC}=30\text{ V}$, $I_C=150\text{ mA}$ $I_{B1}=-I_{B2}=15\text{ mA}$
Fall Time	t_f		60	ns	

See Test Circuit

SWITCHING TIME TEST CIRCUIT



t_{on} SWITCHING



t_{off} SWITCHING

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

