

# SILICON TRANSISTORS

## NTM2369, NTM2369R

### HIGH SPEED SWITCHING, GENERAL PURPOSE AMPLIFIER

### NPN SILICON EPITAXIAL TRANSISTOR

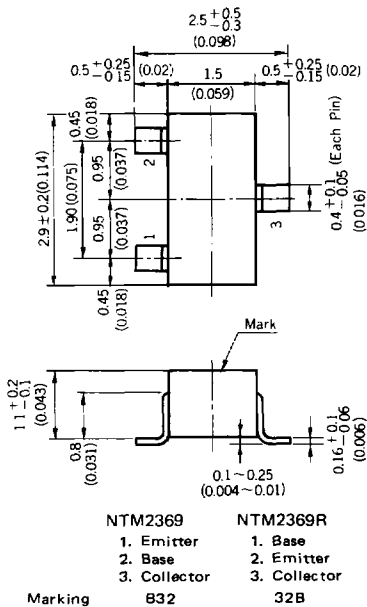
### “MINI MOLD”

#### DESCRIPTION

The NTM2369, NTM2369R are NPN transistors, designed for general purpose amplifier and high speed switching applications, features injection molded plastic package for hybrid IC.

#### PACKAGE DIMENSIONS

in millimeters (inches)



#### FEATURES

- High frequency current gain.
- High speed switching.
- NTM2369, NTM2369R electrically similar to 2N2369.

#### ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

##### Maximum Voltages and Current

Collector to Base Voltage	V <sub>CBO</sub>	40	V
Collector to Emitter Voltage	V <sub>CEO</sub>	15	V
Emitter to Base Voltage	V <sub>EB0</sub>	4.5	V
Collector Current	I <sub>C</sub>	200	mA

##### Maximum Power Dissipation

Total Power Dissipation	P <sub>T</sub>	200	mW
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##### Maximum Temperatures

Storage Temperature	T <sub>stg</sub>	- 55 to + 150	°C
Operating Junction Temperature	T <sub>j</sub>	150	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

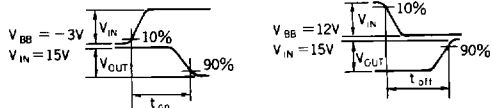
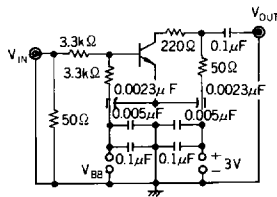
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT	TEST CONDITIONS
Collector to Base Breakdown Voltage	$BV_{CBO}$	40		V	$I_C = 10\mu A, I_E = 0$
Collector to Emitter Breakdown Voltage	$BV_{CEO}$	15		V	$I_C = 10mA, I_B = 0$
Emitter to Base Breakdown Voltage	$BV_{EBO}$	4.5		V	$I_E = 10\mu A, I_C = 0$
Collector Cutoff Current	$I_{CBO}$		0.4	$\mu A$	$V_{CB} = 20V, I_E = 0$
DC Current Gain	$h_{FE1}$	40	120		$V_{CE} = 1.0V, I_C = 10mA$
	$h_{FE2}$	20			$V_{CE} = 2.0V, I_C = 100mA$
Collector Saturation Voltage	$V_{CE(sat)1}$		0.25	V	$I_C = 10mA, I_B = 1.0mA$
	$V_{CE(sat)2}$		0.45	V	$I_C = 100mA, I_B = 10mA$
Base Saturation Voltage	$V_{BE(sat)1}$	0.7	0.85	V	$I_C = 10mA, I_B = 1.0mA$
	$V_{BE(sat)2}$	0.8	1.4	V	$I_C = 100mA, I_B = 10mA$
Gain Bandwidth Product	$f_T$	500		MHz	$V_{CE} = 10V, I_C = 10mA$
Output Capacitance	$C_{ob}$		4.0	pF	$V_{CB} = 5.0V, I_E = 0, f = 1.0MHz$
Input Capacitance	$C_{ib}$		4.0	pF	$V_{EB} = 1.0V, I_C = 0, f = 1.0MHz$

SWITCHING CHARACTERISTICS (Ta = 25°C)

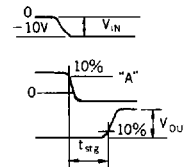
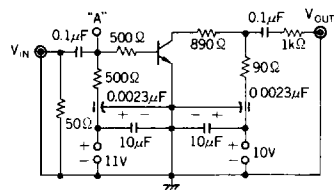
CHARACTERISTIC	SYMBOL	MIN.	MAX.	UNIT	TEST CONDITIONS
Turn on Time	$t_{on}$		12	ns	$V_{CC} = 3.0V, I_C = 10mA, I_{B1} = 3.0mA, V_{BE(off)} = -1.5V$
Turn off Time	$t_{off}$		18	ns	$V_{CC} = 3.0V, I_C = 10mA, I_{B1} = 3.0mA, I_{B2} = -1.5mA$
Storage Time	$t_{stg}$		13	ns	$I_C = 10mA, I_{B1} = -I_{B2} = 10mA$

SWITCHING TIME TEST CIRCUIT

$T_{on}, T_{off}$  TEST CIRCUIT



$T_{stg}$  TEST CIRCUIT



TYPICAL CHARACTERISTICS (Ta = 25°C)

