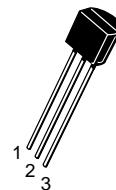
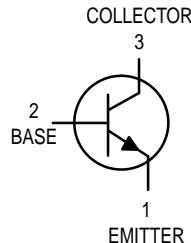


Switching Transistors

NPN Silicon

MPS2369
MPS2369A*

*Motorola Preferred Device



CASE 29-04, STYLE 1
TO-92 (TO-226AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	15	Vdc
Collector-Emitter Voltage	V_{CES}	40	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4.5	Vdc
Collector Current — Continuous	I_C	200	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 10$ mA, $I_B = 0$)	$V_{(BR)CEO}$	15	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 10$ μ A, $V_{BE} = 0$)	$V_{(BR)CES}$	40	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10$ μ A, $I_E = 0$)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10$ μ A, $I_C = 0$)	$V_{(BR)EBO}$	4.5	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 20$ Vdc, $I_E = 0$) ($V_{CB} = 20$ Vdc, $I_E = 0$, $T_A = 125^\circ\text{C}$)	I_{CBO}	— —	— —	0.4 30	μ Adc
Collector Cutoff Current ($V_{CE} = 20$ Vdc, $V_{BE} = 0$)	I_{CES}	—	—	0.4	μ Adc

1. Pulse Test: Pulse Width ≤ 300 μ s, Duty Cycle $\leq 2.0\%$.

Preferred devices are Motorola recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain(1) (IC = 10 mAdc, VCE = 1.0 Vdc) (IC = 10 mAdc, VCE = 1.0 Vdc, TA = -55°C) (IC = 10 mAdc, VCE = 1.0 Vdc) (IC = 10 mAdc, VCE = 0.35 Vdc) (IC = 10 mAdc, VCE = 0.35 Vdc, TA = -55°C) (IC = 30 mAdc, VCE = 0.4 Vdc) (IC = 100 mAdc, VCE = 2.0 Vdc) (IC = 100 mAdc, VCE = 1.0 Vdc)	hFE	— 20 40 40 20 30 20 20	— — — — — — — —	120 — 120 — — — — —	—
Collector-Emitter Saturation Voltage(1) (IC = 10 mAdc, IB = 1.0 mAdc) (IC = 10 mAdc, IB = 1.0 mAdc) (IC = 10 mAdc, IB = 1.0 mAdc, TA = +125°C) (IC = 30 mAdc, IB = 3.0 mAdc) (IC = 100 mAdc, IB = 10 mAdc)	VCE(sat)	— — — — —	— — — — —	0.25 0.20 0.30 0.25 0.50	Vdc
Base-Emitter Saturation Voltage(1) (IC = 10 mAdc, IB = 1.0 mAdc) (IC = 10 mAdc, IB = 1.0 mAdc, TA = +125°C) (IC = 10 mAdc, IB = 1.0 mAdc, TA = -55°C) (IC = 30 mAdc, IB = 3.0 mAdc) (IC = 100 mAdc, IB = 10 mAdc)	VBE(sat)	0.7 0.5 — — —	— — — — —	0.85 — 1.02 1.15 1.60	Vdc

SMALL-SIGNAL CHARACTERISTICS

Output Capacitance (V _{CB} = 5.0 Vdc, I _E = 0, f = 1.0 MHz)	MPS2369,A	C _{obo}	—	—	4.0	pF
Small-Signal Current Gain (IC = 10 mAdc, VCE = 10 Vdc, f = 100 MHz)	MPS2369,A	h _{fe}	5.0	—	—	—

SWITCHING CHARACTERISTICS

Storage Time (IB1 = IB2 = IC = 10 mAdc) (Figure 3)	MPS2369,A	t _s	—	5.0	13	ns
Turn-On Time (V _{CC} = 3.0 Vdc, IC = 10 mAdc, IB1 = 3.0 mAdc) (Figure 1)	MPS2369,A	t _{on}	—	8.0	12	ns
Turn-Off Time (V _{CC} = 3.0 Vdc, IC = 10 mAdc, IB1 = 3.0 mAdc, IB2 = 1.5 mAdc) (Figure 2)	MPS2369,A	t _{off}	—	10	18	ns

1. Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 2.0%.

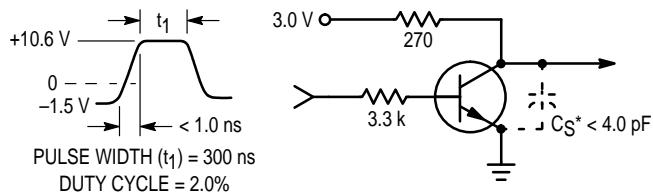
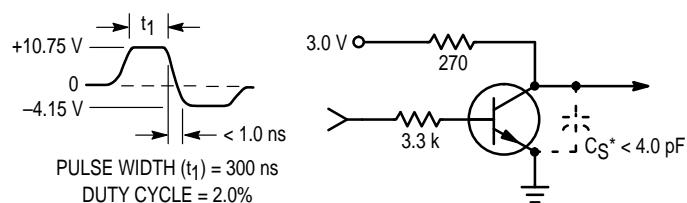
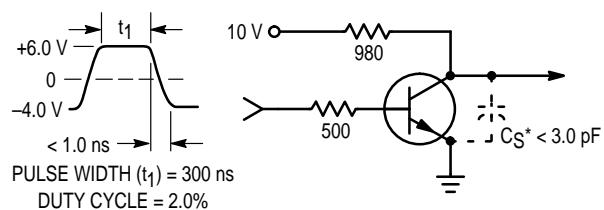
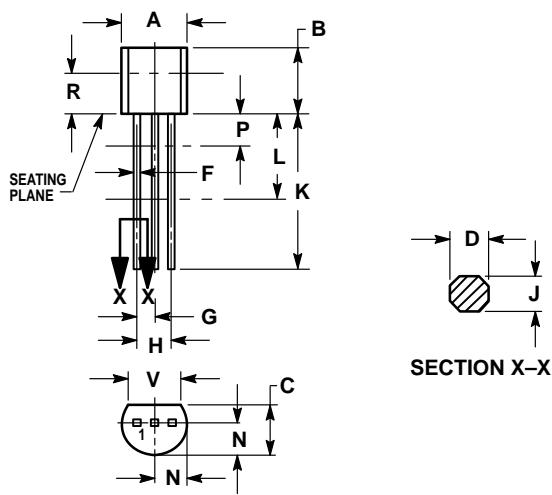
Figure 1. t_{on} CircuitFigure 2. t_{off} Circuit

Figure 3. Storage Test Circuit

* Total shunt capacitance of test jig and connectors.

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

CASE 029-04
(TO-226AA)
ISSUE AD

STYLE 1:
PIN 1. Emitter
2. Base
3. Collector

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How to reach us:

USA/EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244-6609
INTERNET: <http://Design-NET.com>

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

