

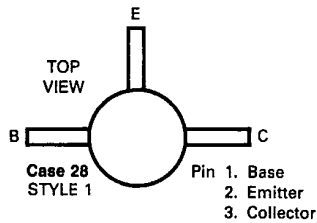
6367255 MOTOROLA SC (DIODES/OPTO)

34C 38219 D

MICRO-T (continued)

7-35-09

MMT3014 — NPN SWITCHING TRANSISTOR



- designed for high-speed, saturated switching applications where high-density packaging is required.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	20	Vdc
Collector-Base Voltage	V_{CB}	40	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current — Continuous	I_C	200	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	250 2.0	mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{slg}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	0.50	°C/mW

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

Parameter	Test Conditions	Min	Max	Unit
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OFF CHARACTERISTICS

BV_{CEO}	$I_C = 10 \text{ mAdc}, I_B = 0$	20	—	Vdc
BV_{CBO}	$I_C = 100 \mu\text{Adc}, I_E = 0$	40	—	Vdc
BV_{EBO}	$I_E = 100 \mu\text{Adc}, I_C = 0$	5.0	—	Vdc
I_{CBO}	$V_{CB} = 20 \text{ Vdc}, I_E = 0$	—	100	nAdc

ON CHARACTERISTICS

h_{FE}	$I_C = 30 \text{ mAdc}, V_{CE} = 0.4 \text{ Vdc}$ $I_C = 100 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$	50 25	200 —	— —
$V_{CE(sat)}$	$I_C = 30 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$	—	0.22	Vdc
$V_{BE(sat)}$	$I_C = 30 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$	0.70	0.9	Vdc

SMALL-SIGNAL CHARACTERISTICS

f_T	$I_C = 30 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$	350	—	MHz
C_{ib}	$V_{BE} = 0.5 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz}$	—	8.0	pF
C_{ob}	$V_{CB} = 5.0 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$	—	5.0	pF

continued

6367255 MOTOROLA SC (DIODES/OPTO)

34C 38220 D

MICRO-T (continued)

MMT3014 (continued)

T-35-09

SWITCHING CHARACTERISTICS

t_{on}	$V_{CC} = 2.0 \text{ Vdc}, I_C = 30 \text{ mAdc}, I_{B1} = 3.0 \text{ mAdc}$	—	16	ns
t_{off}	$V_{CC} = 2.0 \text{ Vdc}, I_C = 30 \text{ mAdc}, I_{B1} = 3.0 \text{ mAdc}, I_{B2} = 3.0 \text{ mAdc}$	—	25	ns
τ_s	$I_C = I_{B1} = I_{B2} = 10 \text{ mAdc}$	—	18	ns

FIGURE 1 – TURN-ON AND TURN-OFF TIME TEST CIRCUIT

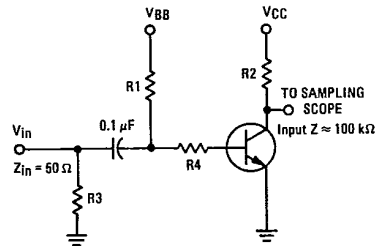
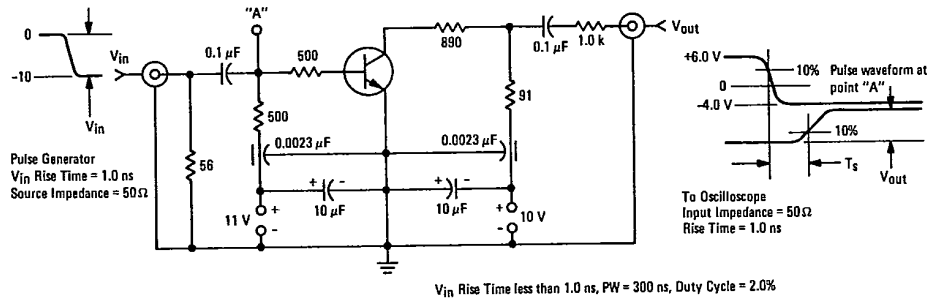


FIGURE 2 – CHARGE STORAGE TIME CONSTANT TEST CIRCUIT



Test	SWITCHING TEST CIRCUIT VALUES							INPUT PULSE		
	V_{in}	V_{BB}	V_{CC}	R1	R2	R3	R4	t_r	t_f	Pulse Width
t_{on} t_{off}	VOLTS			OHMS				ns		
	7.0	GND	2.0	100	62	100	2.0 k	<1.0	—	>200

14