2N3252
2N3253
2N3444

GENERAL PURPOSE

NPN SILICON

JAN, JTX AVAILABLE
2N3253, 2N3444
CASE 79, STYLE 1
TO-39 (TO-205AD)

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MAXIMUM RATINGS

Rating	Symbol	2N3252	2N3253	2N3444	Unit
Collector-Emitter Voltage	V_{CEO}	30	40	50	Vdc
Collector-Base Voltage	V_{CBO}	60	75	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0			Vdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 5.71			Watts mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5.0 28.6			Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$ $R_{\theta JA}$	35 0.175	°C/W °C/mW

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

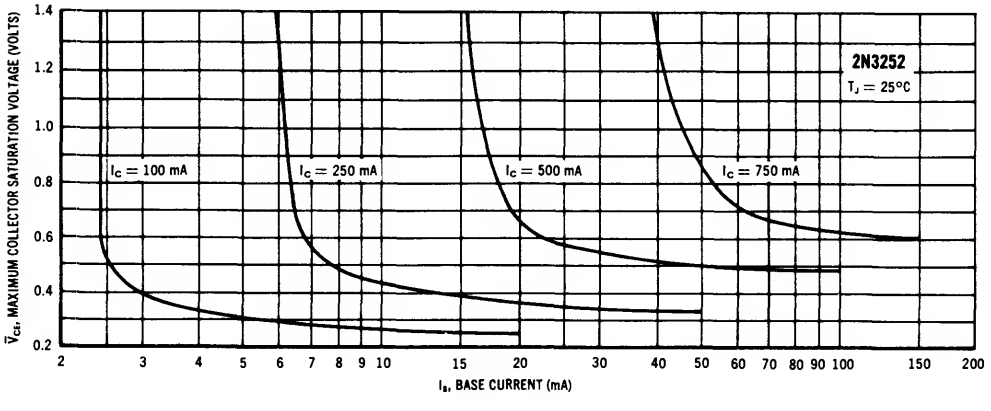
Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, pulsed, I_B = 0)	 2N3252 2N3253 2N3444	$V_{(BR)CEO}$	 30 40 50	 — — —	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	 2N3252 2N3253 2N3444	$V_{(BR)CBO}$	 60 75 80	 — — —	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current (V_{CE} = 40 Vdc, $V_{EB(off)}$ = 4.0 Vdc) (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 4.0 Vdc)	 2N3252 2N3253, 2N3444	I_{CEX}	 — —	 0.5 0.5	μAdc
Collector Cutoff Current (V_{CB} = 40 Vdc, I_E = 0) (V_{CB} = 40 Vdc, I_E = 0, T_A = 100°C) (V_{CB} = 60 Vdc, I_E = 0) (V_{CB} = 60 Vdc, I_E = 0, T_A = 100°C)	 2N3252 2N3252 2N3253, 2N3444 2N3253, 2N3444	I_{CBO}	 — 	 0.50 75.0 0.50 75.0	μAdc
Emitter Cutoff Current (V_{BE} = 4.0 Vdc, I_C = 0)		I_{EBO}	—	0.05	μAdc
Base Cutoff Current (V_{CE} = 40 Vdc, $V_{EB(off)}$ = 4.0 Vdc) (V_{CE} = 60 Vdc, $V_{EB(off)}$ = 4.0 Vdc)	 2N3252 2N3253, 2N3444	I_{BL}	 — —	 0.50 0.50	μAdc
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 150 mAdc, V_{CE} = 1.0 Vdc) (I_C = 500 mAdc, V_{CE} = 1.0 Vdc) (I_C = 1.0 Adc, V_{CE} = 5.0 Vdc)	 2N3252 2N3253 2N3444 2N3252 2N3253 2N3444 2N3252 2N3253 2N3444	h_{FE}	 30 25 20 30 25 20 25 20 15	 — — — 90 75 60 — — —	—

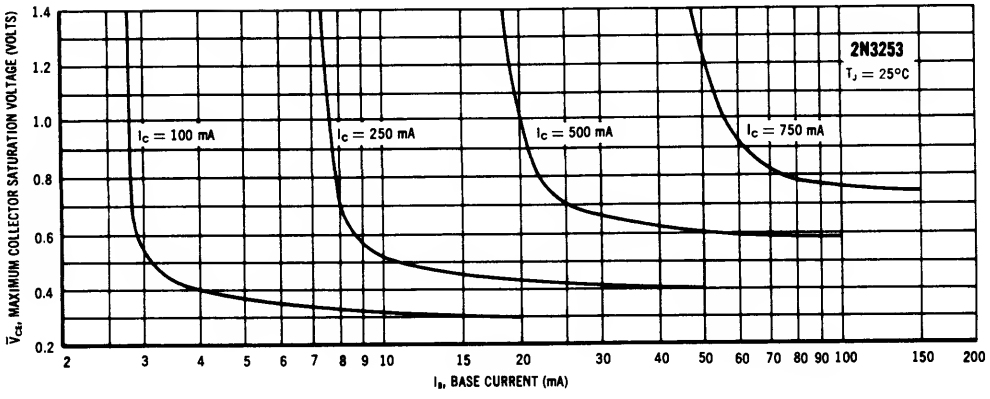
ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

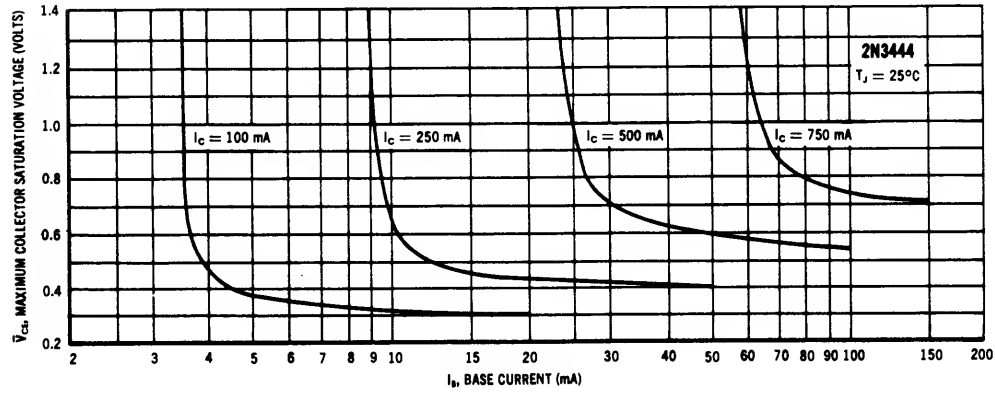
Characteristic		Symbol	Min	Max	Unit
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$			Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	2N3252		—	0.3	
	2N3253, 2N3444		—	0.35	
(I_C = 500 mAdc, I_B = 500 mAdc)	2N3252		—	0.5	
	2N3253, 2N3444		—	0.60	
(I_C = 1.0 Adc, I_B = 100 mAdc)	2N3252		—	1.0	
	2N3253, 2N3444		—	1.2	
Base-Emitter Saturation Voltage(1)		$V_{BE(sat)}$			Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)			—	1.0	
(I_C = 500 mAdc, I_B = 50 mAdc)			0.7	1.3	
(I_C = 1.0 Adc, I_B = 100 mAdc)			—	1.8	
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain — Bandwidth Product		f_T			MHz
(I_C = 50 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	2N3252		200	—	
	2N3253, 2N3444		175	—	
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	12	pF
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 100 kHz)		C_{ibo}	—	80	pF
SWITCHING CHARACTERISTICS					
Delay Time	I_C = 500 mAdc, I_{B1} = 50 mAdc	t_d	—	15	ns
Rise Time	V_{CC} = 30 V, V_{BE} = 2.0 V 2N3252	t_r	—	30	ns
	2N3253, 2N3444		—	35	
Storage Time	I_C = 500 mAdc, I_{B1} = I_{B2} = 50 mAdc	t_s	—	40	ns
Fall Time	V_{CC} = 30 V	t_f	—	30	ns
Total Control Charge (I_C = 500 mAdc, I_{B1} = 50 mAdc, V_{CC} = 30 V)		Q_T	—	5.0	nC

(1) Pulse Test: Pulse Width = 300 μs, Duty Cycle = 2.0%.

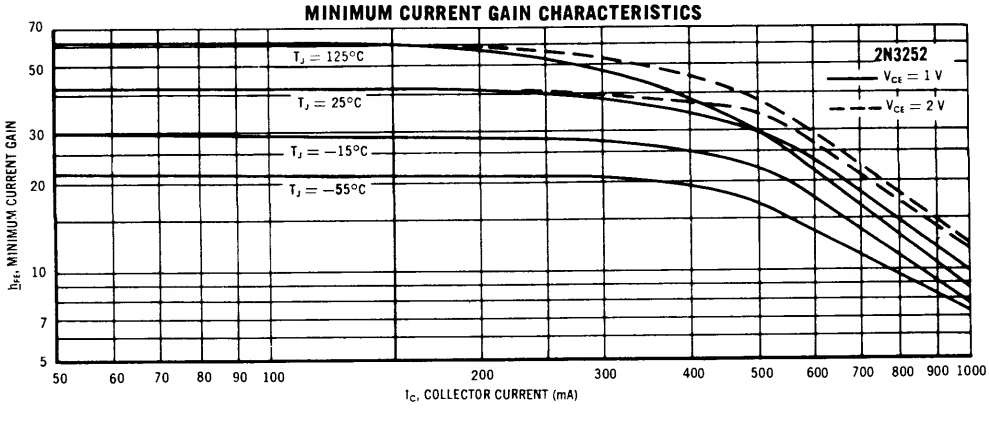
COLLECTOR SATURATION VOLTAGE CHARACTERISTICS

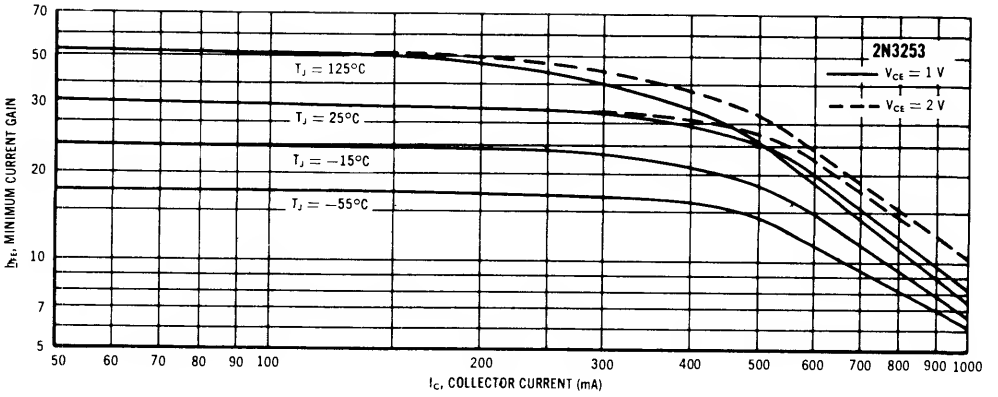


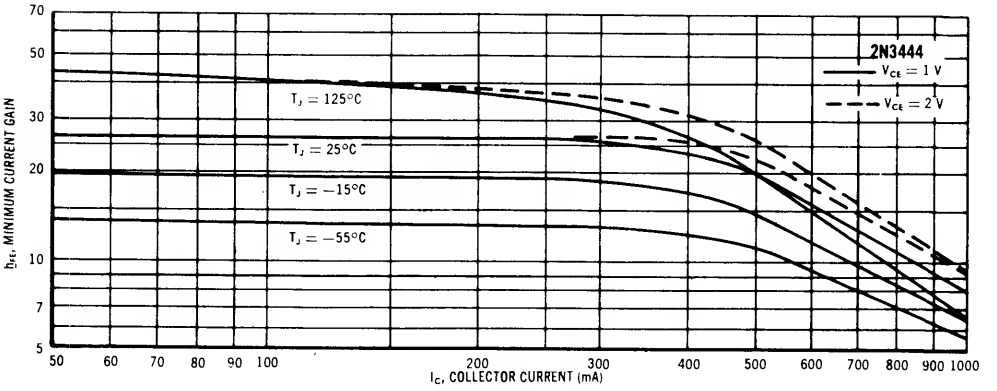




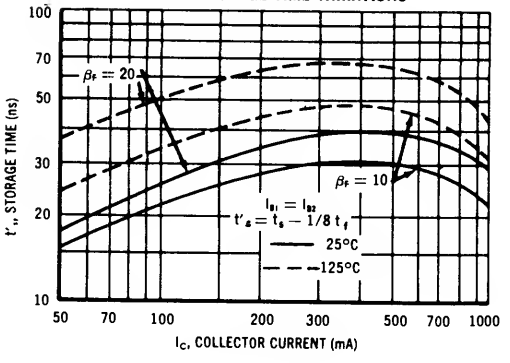
MINIMUM CURRENT GAIN CHARACTERISTICS



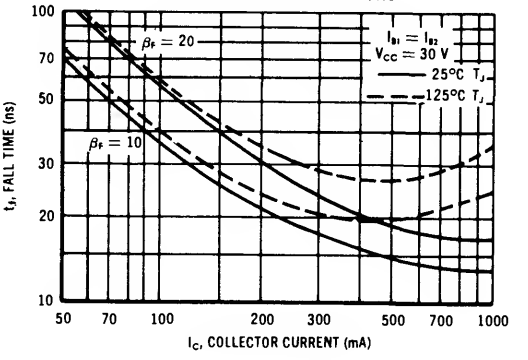




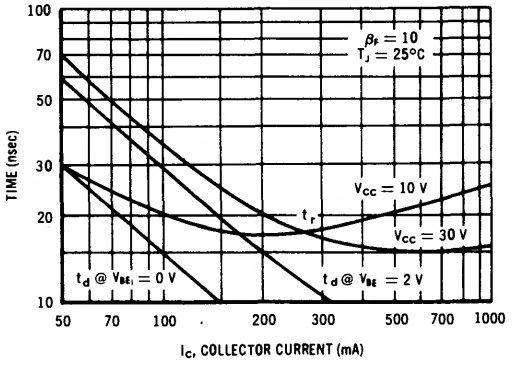
TYPICAL STORAGE TIME VARIATIONS



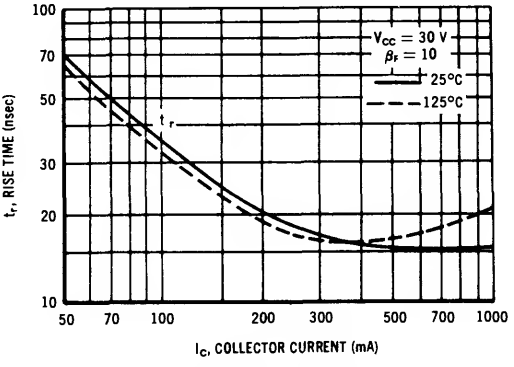
TYPICAL FALL TIME VARIATIONS



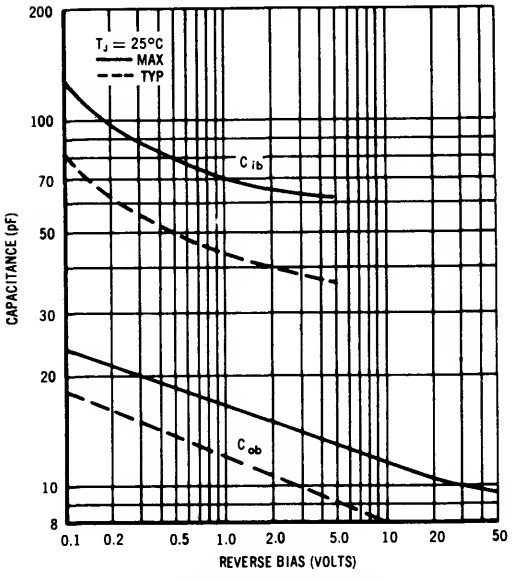
TYPICAL TURN-ON TIME VARIATIONS WITH VOLTAGE



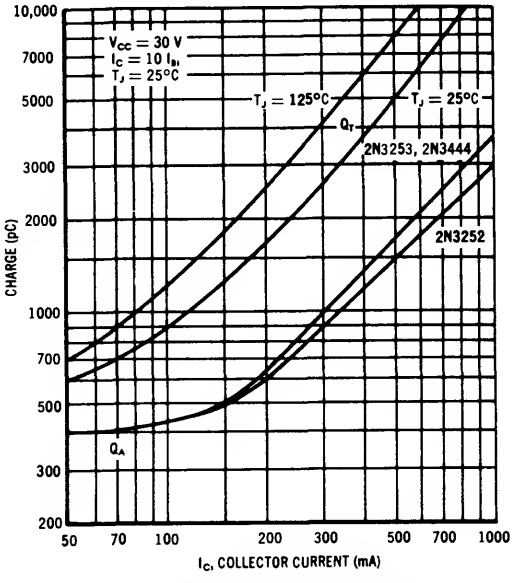
TYPICAL RISE TIME VARIATIONS WITH TEMPERATURE



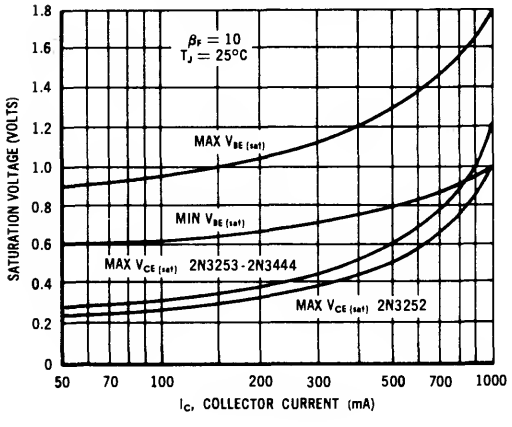
JUNCTION CAPACITANCE VARIATIONS



MAXIMUM CHARGE DATA



LIMITS OF SATURATION VOLTAGES



TYPICAL TEMPERATURE COEFFICIENTS