



6 Lake Street, Lawrence, MA 01841
1-800-446-1158 / (978) 620-2600 / Fax: (978) 689-0803
Website: <http://www.microsemi.com>

TECHNICAL DATA SHEET

RADIATION HARDENED NPN SILICON SWITCHING TRANSISTOR *Qualified per MIL-PRF-19500/366*

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Emitter-Base Cutoff Current $V_{EB} = 4.0\text{Vdc}$ $V_{EB} = 6.0\text{Vdc}$	I_{EBO}		25 10	ηAdc μAdc
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio $I_C = 0.1\text{mAdc}$, $V_{CE} = 10\text{Vdc}$ 2N3498, 2N3500 2N3499, 2N3501	h_{FE}	20 35		
$I_C = 1.0\text{mAdc}$, $V_{CE} = 10\text{Vdc}$ 2N3498, 2N3500 2N3499, 2N3501		25 50		
$I_C = 10\text{mAdc}$, $V_{CE} = 10\text{Vdc}$ 2N3498, 2N3500 2N3499, 2N3501		35 75		
$I_C = 150\text{mAdc}$, $V_{CE} = 10\text{Vdc}$ 2N3498, 2N3500 2N3499, 2N3501		40 100	120 300	
$I_C = 300\text{mAdc}$, $V_{CE} = 10\text{Vdc}$ 2N3500 2N3501		15 20		
$I_C = 500\text{mAdc}$, $V_{CE} = 10\text{Vdc}$ 2N3498 2N3499		15 20		
Collector-Emitter Saturation Voltage $I_C = 10\text{mAdc}$, $I_B = 1.0\text{mAdc}$ $I_C = 300\text{mAdc}$, $I_B = 30\text{mAdc}$ $I_C = 150\text{mAdc}$, $I_B = 15\text{mAdc}$ All Types 2N3498, 3N3499 2N3500, 2N3501	$V_{CE(sat)}$		0.2 0.6 0.4	Vdc
Base-Emitter Saturation Voltage $I_C = 10\text{mAdc}$, $I_B = 1.0\text{mAdc}$ $I_C = 300\text{mAdc}$, $I_B = 30\text{mAdc}$ $I_C = 150\text{mAdc}$, $I_B = 15\text{mAdc}$ All Types 2N3498, 3N3499 2N3500, 2N3501	$V_{BE(sat)}$		0.8 1.4 1.2	Vdc

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Magnitude, Forward Current Transfer Ratio $I_C = 20\text{mAdc}$, $V_{CE} = 20\text{Vdc}$, $f = 100\text{MHz}$	$ h_{fe} $	1.5	8.0	
Output Capacitance $V_{CB} = 10\text{Vdc}$, $I_E = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$ 2N3498, 2N3499 2N3500, 2N3501	C_{obo}		10 8.0	pF
Input Capacitance $V_{EB} = 0.5\text{Vdc}$, $I_C = 0$, $100\text{kHz} \leq f \leq 1.0\text{MHz}$	C_{ibo}		80	pF



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SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-On Time $V_{EB} = 5V_{dc}$; $I_C = 150mA_{dc}$; $I_{B1} = 15mA_{dc}$	t_{on}		115	ηs
Turn-Off Time $I_C = 150mA_{dc}$; $I_{B1} = I_{B2} = 15mA_{dc}$	t_{off}		1150	ηs

SAFE OPERATING AREA

DC Tests

$T_C = +25^{\circ}C$, $t_r \geq 10\eta s$; 1 Cycle, $t = 1.0s$

Test 1

$V_{CE} = 10V_{dc}$, $I_C = 500mA_{dc}$ 2N3498, 2N3499

$V_{CE} = 16.67V_{dc}$, $I_C = 300mA_{dc}$ 2N3500, 2N3501

$V_{CE} = 10V_{dc}$, $I_C = 113mA_{dc}$ 2N3501UB

Test 2

$V_{CE} = 50V_{dc}$, $I_C = 100mA_{dc}$ All Types

$V_{CE} = 50V_{dc}$, $I_C = 23mA_{dc}$ 2N3501UB

Test 3

$V_{CE} = 80V_{dc}$, $I_C = 40mA_{dc}$ All Types

$V_{CE} = 80V_{dc}$, $I_C = 14mA_{dc}$ 2N3501UB

Clamped Switching

$T_A = +25^{\circ}C$

Test 1

$I_B = 85mA_{dc}$, $I_C = 500mA_{dc}$ 2N3498, 2N3499

$I_B = 50mA_{dc}$, $I_C = 300mA_{dc}$ 2N3500, 2N3501

(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$