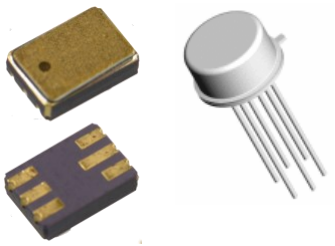
2N5793, 2N5793A, 2N5794
2N5794A, 2N5794AU, 2N5794U

NPN Dual Silicon Transistors

Rev. V1

Features

- Available in JAN, JANTX, JANTXV, JANS and JANSR per MIL-PRF-19500/495
- TO-78 and U package types
- Radiation Tolerant Levels M, D, P, L, and R



Electrical Characteristics (T_A = +25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	I_C = 10 mA dc	$V_{(BR)CEO}$	V dc	40	—
Collector - Base Cutoff Current	V_{CB} = 75 V dc V_{CB} = 50 V dc	I_{CBO1} I_{CBO2}	µA dc nA dc	—	10 10
Emitter - Base Cutoff Current	V_{EB} = 6.0 V dc V_{EB} = 4.0 V dc	I_{EBO1} I_{EBO2}	µA dc nA dc	—	10 10
On Characteristics[1]					
Forward Current Transfer Ratio	2N5793, A V_{CE} = 10 V dc; I_C = 0.1 mA dc V_{CE} = 10 V dc; I_C = 1.0 mA dc V_{CE} = 10 V dc; I_C = 10 mA dc V_{CE} = 10 V dc; I_C = 150 mA dc V_{CE} = 10 V dc; I_C = 300 mA dc V_{CE} = 1.0 V dc; I_C = 150 mA dc 2N5794, A, U, AU V_{CE} = 10 V dc; I_C = 0.1 mA dc V_{CE} = 10 V dc; I_C = 1.0 mA dc V_{CE} = 10 V dc; I_C = 10 mA dc V_{CE} = 10 V dc; I_C = 150 mA dc V_{CE} = 10 V dc; I_C = 300 mA dc V_{CE} = 1.0 V dc; I_C = 150 mA dc	 h_{FE1} h_{FE2} h_{FE3} h_{FE4} h_{FE5} h_{FE6} h_{FE1} h_{FE2} h_{FE3} h_{FE4} h_{FE5} h_{FE6}	 h_{FE} 	 20 25 35 40 25 20 35 50 75 100 40 50	 120 300
Collector - Emitter Saturation Voltage	I_C = 150 mA dc, I_B = 15 mA dc I_C = 300 mA dc, I_B = 30 mA dc	$V_{CE(SAT)1}$ $V_{CE(SAT)2}$	Vdc	—	0.3 0.9
Base - Emitter Saturation Voltage	I_C = 150 mA dc, I_B = 15 mA dc	$V_{BE(SAT)1}$	Vdc	0.6	1.2
Base - Emitter Saturation Voltage	I_C = 300 mA dc, I_B = 30 mA dc	$V_{BE(SAT)2}$	Vdc	—	1.8
Forward-Current Transfer Ratio (Gain Ratio) (2N5793A, 2N5794A, 2N5794AU)	V_{CE} = 10 V dc; I_C = 1 mA dc	$\frac{h_{FE2-1}}{h_{FE2-2}}$		0.9	1.11

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

Electrical Characteristics (T_A = +25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Forward-Current Transfer Ratio (Gain Ratio) (2N5793A, 2N5794A, 2N5794AU)	V_{CE} = 10 V dc; I_C = 10 mA dc	$\frac{h_{FE3-1}}{h_{FE3-2}}$		0.9	1.11
Absolute Value of Base Emitter-Voltage Differential (2N5793A, 2N5794A, 2N5794AU)	V_{CE} = 10 V dc; I_C = 1 mA dc	$\lvert V_{BE1}-V_{BE2}\rvert$	mV dc	—	10
Collector-Base Cutoff Current	T_A = +150°C V_{CB} = 50 V dc	I_{CBO3}	µA dc	—	10
Forward Current Transfer Ratio	T_A = -55°C V_{CE} = 10 V dc; I_C = 150 mA dc 2N5793, 2N5793A 2N5794, 2N5794U 2N5794A, 2N5794AU	h_{FE7}		 16 40 40	
Dynamic Characteristics					
Magnitude of Common Small-Signal Short-Circuit Forward Current Transfer Ratio	I_C = 20 mA dc; V_{CE} = 20 V dc; f = 100 MHz	$\lvert h_{FE} \rvert$	-	2.0	10
Open Circuit Output Capacitance	V_{CB} = 10 V dc; I_E = 0 mA; 100 kHz ≤ f ≤ 1 MHz	C_{obo}	pF	—	8.0
Input Capacitance (Output Open-Circuited)	V_{EB} = 0.5 V dc; I_C = 0; 100 kHz ≤ f ≤ 1 MHz	C_{ibo}	pF	—	33
Switching Characteristics					
Turn-On Time (saturated)	V_{CC} = 30 V dc; I_C = 150 mA dc; I_{B1} = 15 mA dc; $V_{BE(OFF)}$ = 0.5 V dc	t_{on}	ns	—	45
Turn-Off Time (saturated)	V_{CC} = 30 Vdc; I_C = 150 mA dc; I_{B1} = I_{B2} = 15 mA dc	t_{off}	ns	—	310

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Absolute Maximum Ratings (T_A = +25°C unless otherwise specified)

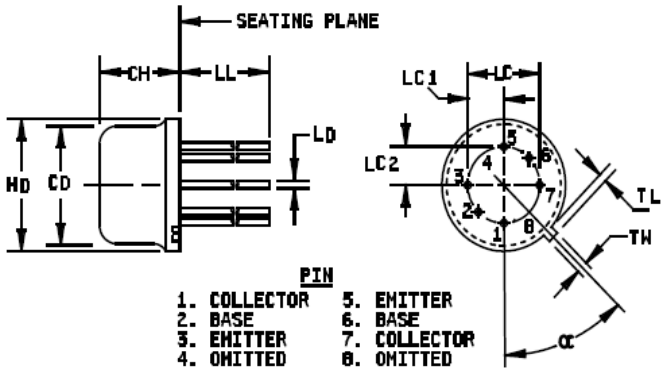
Ratings	Symbol	Value
Collector - Emitter Voltage	V_{CEO}	40 V dc
Collector - Base Voltage	V_{CBO}	75 V dc
Emitter - Base Voltage	V_{EBO}	6.0 V dc
Collector Current	I_C	600 mA dc
Total Power Dissipation @ T_A = +25°C One Section Both Sections	P_T (1)	 500 mW 600 mW
Operating & Storage Temperature Range	T_J, T_{STG}	-65°C to +175°C

Thermal Characteristics

Types	$R_{\theta JA}$ One Section	$R_{\theta JA}$ Both Sections	$R_{\theta JSP}$ One Section	$R_{\theta JSP}$ Both Sections	$R_{\theta JPCB}$ One Section	$R_{\theta JPCB}$ Both Sections
	°C/W (2)	°C/W (2)	°C/W (2)	°C/W (2)	°C/W (2)	°C/W (2)
2N5793, 2N5794	350	290				
2N5793A, 2N5794A	350	290				
2N5794U, 2N5794AU			110 110	90 90	350 350	290 290

(1) For T_A > +25°C, derate linearly 2.86 mW/°C one section, 3.43 mW/°C both sections
(2) For the thermal resistance curves see figures 4, 5 and 6 of MIL-PRF-19500/495

Outline Drawing

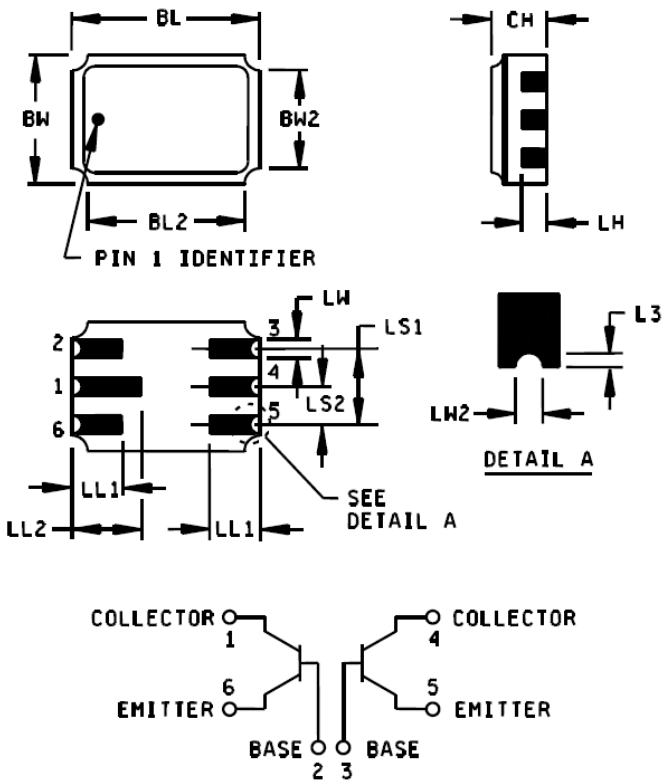


Dimensions					
Symbol	Inches		Millimeters		Note
	Min	Max	Min	Max	
CD	.305	.335	7.75	8.51	
CH	.150	.185	3.81	4.70	
HD	.335	.370	8.51	9.40	
LD	.016	.021	0.41	0.53	
LL	.500		12.70		
LC	.200 BSC		5.08 BSC		4
LC1	.100 BSC		2.54 BSC		
LC2	.100 BSC		2.54 BSC		
TL	.029	.045	0.74	1.14	3
TW	.028	.034	0.71	0.86	
α	45° TP		45° TP		6

NOTES:
1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Measured from maximum diameter of the product.
4. Leads having maximum diameter .019 inch (.483 mm) measured in gaging plan .054 inch (1.37 mm) + .001 inch (.025 mm) - .000 inch (.000 mm) below the seating plane of the product shall be within .007 inch (.178 mm) of their true position relative to a maximum width tab.
5. The product may be measured by direct methods or by gauge.
6. Tab centerline.
7. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 1. Physical dimensions (2N5793 and 2N5794) (similiar to TO-99).

Outline Drawing



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
BL	.240	.250	6.10	6.35
BL_2		.250		6.35
BW	.165	.175	4.19	4.45
BW_2		.175		4.45
CH	.058	.100	1.47	2.54
L_3	.003	.007	0.08	0.18
LH	.026	.039	0.66	0.99

Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
LL_1	.060	.070	1.52	1.78
LL_2	.082	.098	2.08	2.49
LS_1	.095	.105	2.41	2.67
LS_2	.045	.055	1.14	1.40
LW	.022	.028	0.56	0.71
LW_2	.006	.022	0.15	0.56

NOTES:
1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension "CH" controls the overall package thickness.
4. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option from that shown on the drawing.
5. Dimensions "LW2" minimum and "L3" minimum and the appropriate castellation length define an unobstructed three-dimensional space traversing all of the ceramic layers in which a castellation was designed. (Castellations are required on bottom two layers, optional on top ceramic layer.) Dimension "LW2" maximum and "L3" maximum define the maximum width and depth of the castellation at any point on its surface. Measurement of these dimensions may be made prior to solder dipping.
6. Lead 4 = collector.
7. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.

FIGURE 2. Physical dimensions, 2N5794U.

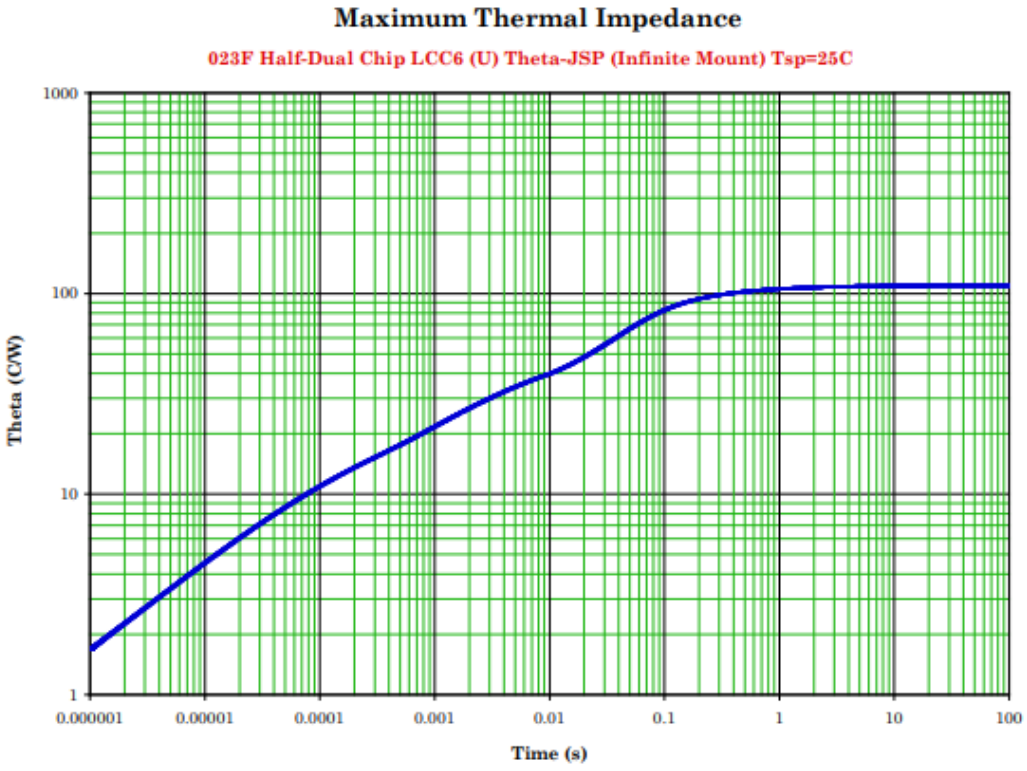


FIGURE 4. Thermal impedance graph ($R_{\theta JSP}$) for 2N5794U, 2N5794UC, 2N5794AU, and 2N5794AUC (U and UC).

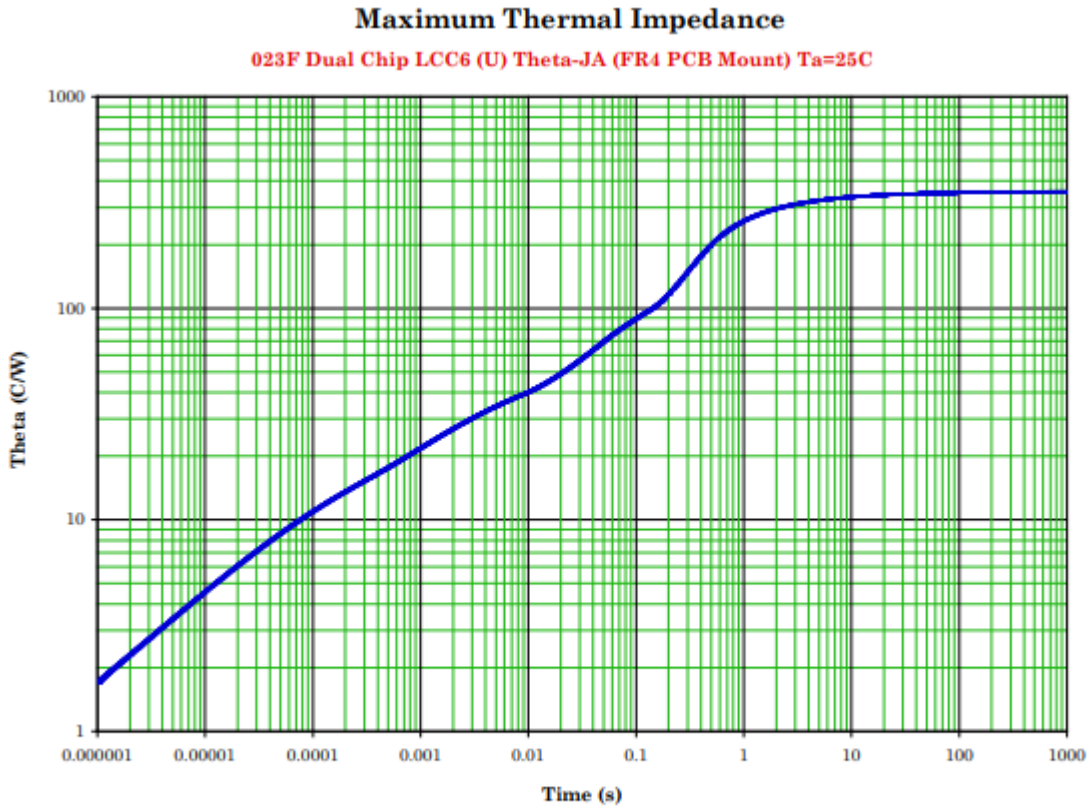


FIGURE 5. Thermal impedance graph ($R_{\theta JPCB}$) for 2N5794U, 2N5794UC, 2N5794AU, and 2N5794AUC (U and UC).

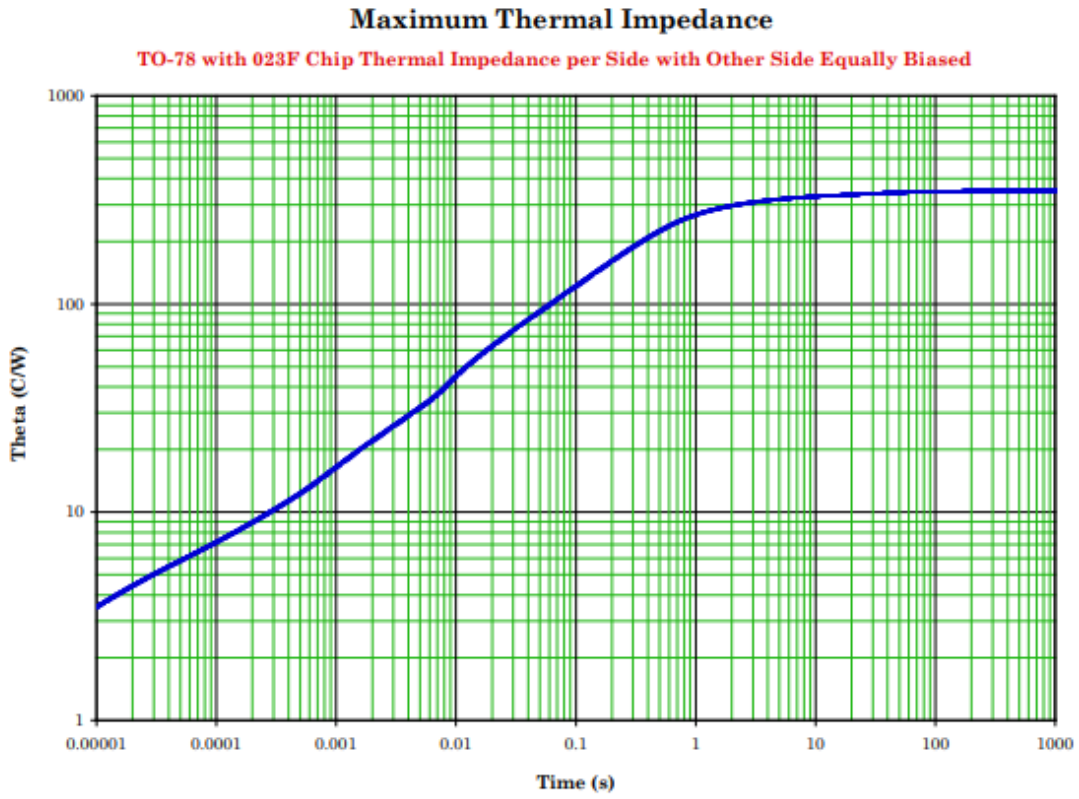


FIGURE 6. Thermal impedance graph ($R_{\theta JA}$) for 2N5794U, 2N5794UC, 2N5794AU, and 2N5794AUC (U and UC).