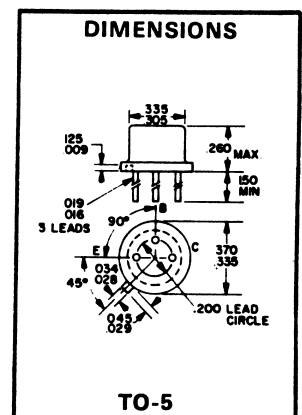
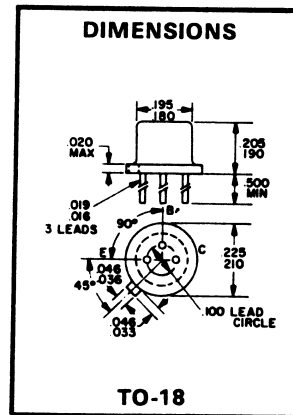
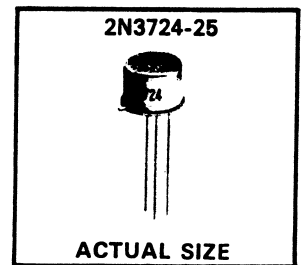
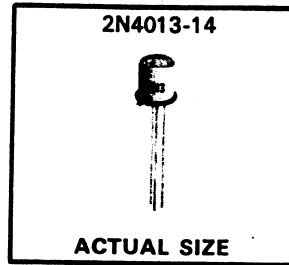


SILICON
SWITCHING
TRANSISTORS

2N3724 **2N4013**
2N3725 **2N4014**

HIGH SPEED NPN SILICON PLANAR EPITAXIAL HIGH-VOLTAGE HIGH-CURRENT TRANSISTORS

- High Voltage: 80V min. 2N3725, 2N4014
- High Gain: 65 typ. @ 1000 mA
- Low $V_{CE(sat)}$: 0.5V typ. @ 1000 mA
- Low C_{ob} : 4.8 pF typ. @ 10V. 2N3725, 2N4014
- Fast t_{on} : 18 nsec typ. @ 500mA
- Fast t_{off} : 45 nsec typ. @ 500mA



The ITT 2N3724 • 2N3725 and 2N4013 • 2N4014 are high-voltage, high-current NPN silicon planar epitaxial transistors useful for applications requiring breakdown voltages up to 50V and operating current to one ampere. Low saturation voltage and fast switching times make the transistor ideal for high-frequency amplifiers, core drivers, relay drivers and pulse generators.

ABSOLUTE MAXIMUM RATINGS

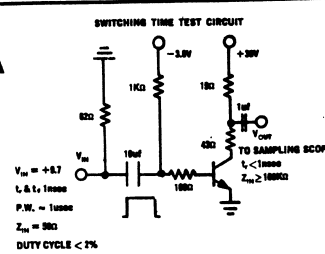
CHARACTERISTICS	2N3724 2N4013	2N3725 2N4014	UNITS
Collector-to-Base Voltage	50	80	Volts
Collector-to-Emitter Voltage (shorted base)	50	80	Volts
Collector-to-Emitter Voltage (open base)	30	50	Volts
Emitter-to-Base Voltage	6.0	6.0	Volts
Collector Current (300 μ sec; 1% duty cycle)	1.0	1.0	Amps
Junction Temperature (op. and stg.)	-65 to +200		$^{\circ}$ C
Maximum Power Dissipation	2N4013 2N4014	2N3724 2N3725	
Total Dissipation @ $T_c = 25^{\circ}$ C	1.2	3.5	Watts
(derate above 25 $^{\circ}$ C)	(6.8 mW/ $^{\circ}$ C)	(20mW/ $^{\circ}$ C)	
Total Dissipation @ $T_A = 25^{\circ}$ C	0.36	0.8	Watts
(derate above 25 $^{\circ}$ C)	(2.06 mW/ $^{\circ}$ C)	(4.56 mW/ $^{\circ}$ C)	

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ELECTRICAL CHARACTERISTICS @ 25°C unless otherwise noted.

SYMBOL	2N3724 2N4013			2N3725 2N4014			UNIT	CONDITIONS
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
BV_{CEO} BV_{CES} LV_{CEO}^{1, 2} BV_{EBO}	50			80			Vdc Vdc Vdc Vdc	I_C = 10μA I_C = 10μA I_C = 10mA I_E = 10μA
h_{FE}¹	30 60 40 35 25 30 30 20	60 90 65 50 45 65 45 40	150	30 60 40 35 20 25 30 20	60 90 65 50 40 65 40 35	150		I _C = 10mA V _{CE} = 1.0V I _C = 100mA V _{CE} = 1.0V I _C = 300mA V _{CE} = 1.0V I _C = 500mA V _{CE} = 1.0V I _C = 800mA V _{CE} = 2.0V I_C = 1000mA V_{CE} = 5.0V I _C = 100mA V _{CE} = 1.0V T _A = -55°C I _C = 500mA V _{CE} = 1.0V T _A = -55°C
V_{CE(sat)}¹		0.11 0.13 0.22 0.3 0.4 0.5	0.25 0.2 0.32 0.42 0.65 0.75		0.19 0.21 0.31 0.4 0.5 0.6	0.25 0.26 0.4 0.52 0.8 0.95	Vdc Vdc Vdc Vdc Vdc Vdc	I _C = 10mA I _B = 1.0mA I _C = 100mA I _B = 10mA I _C = 300mA I _B = 30mA I _C = 500mA I _B = 50mA I _C = 800mA I _B = 80mA I_C = 1000mA I_B = 100mA
V_{BE(sat)}¹		0.64 0.75 0.89 0.9 1.0 1.1	0.76 0.86 1.1 1.2 1.5 1.7		0.64 0.75 0.89 0.9 1.0 1.1	0.76 0.86 1.1 1.2 1.5 1.7	Vdc Vdc Vdc Vdc Vdc Vdc	I _C = 10mA I _B = 1.0mA I _C = 100mA I _B = 10mA I _C = 300mA I _B = 30mA I _C = 500mA I _B = 50mA I _C = 800mA I _B = 80mA I _C = 1000mA I _B = 100mA
I_{CSO}		0.25 27	1.7 120		0.33 25	1.7 120	μA μA μA μA	V _{CB} = 40V V _{CB} = 60V V _{CB} = 40V T _A = 100°C V _{CB} = 60V T _A = 100°C
C_{ob} C_{ib}		6.0 40	12 55		4.8 40	10 55	pF pF	V_{CB} = 10V V_{EB} = 0.5V
h_{fe}	3.0	4.5		3.0	4.5			I _C = 50mA V _{CE} = 10V f = 100MHz
t_{on}		18	35		18	35	nsec	I_C ≈ 500mA I_{B1} ≈ 50mA I_{B2} ≈ 50mA  <p>SWITCHING TIME TEST CIRCUIT</p> <p>V_{cc} = +5V I_C & I_B = 100mA P.W. = 100ns Z_{in} = 50Ω DUTY CYCLE < 1%</p>
t_{off}		45	60		45	60	nsec	

NOTES: 1. Pulsed width ≤ 300 μsec; 1% duty cycle.
 2. Lowest emitter-to-collector voltage.