



ALL RIGHTS RESERVED. NO PORTION OF THIS PUBLICATION, WHETHER IN WHOLE OR IN PART, CAN BE REPRODUCED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPC TECHNOLOGY.

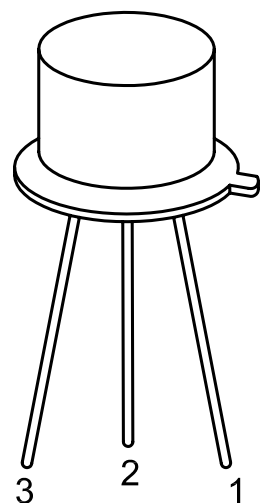
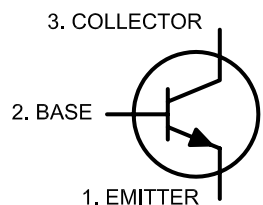
SPC-F005.DWG

REVISIONS

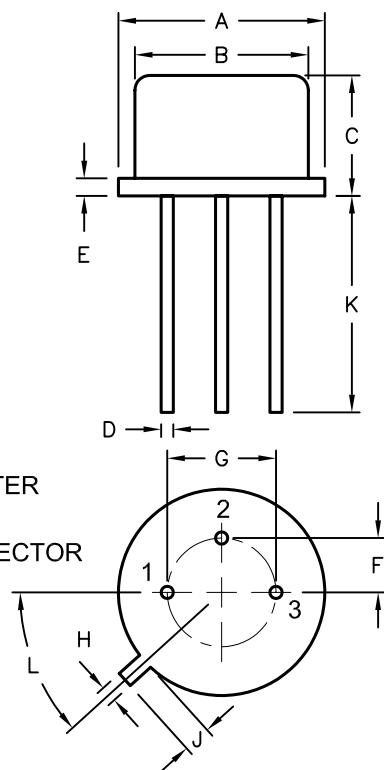
DOC. NO. SPC-F005 * Effective: 7/8/02 * DCP No: 1398

DCP #	REV	DESCRIPTION	DRAWN	DATE	CHECKD	DATE	APPRVD	DATE
1447	A	RELEASED	HYO	5/10/02	JWM	2/20/04	JC	2/20/04
1885	B	UPDATED TO ROHS COMPLIANCE	EO	02/03/06	HO	2/6/06	HO	2/6/06

NPN



1. EMITTER
2. BASE
3. COLLECTOR



This is a silicon NPN transistor in a TO-18 type case designed primarily for amplifier and switching applications. This device features high breakdown voltage, low leakage current, low capacity, and beta useful over an extremely wide current range.

Absolute Maximum Ratings:

- Collector-Base Voltage, $V_{CBO} = 140V$
- Collector-Emitter Voltage, $V_{CEO} = 80V$
- Emitter-Base Voltage, $V_{EBO} = 7V$
- Continuous Collector Current, $I_C = 1A$
- Total Device Dissipation ($T_A = +25^\circ C$), $P_D = 0.5W$
Derate above $25^\circ C = 2.85mW/^\circ C$
- Total Device Dissipation ($T_C = +25^\circ C$), $P_D = 1.8W$
Derate above $25^\circ C = 10.6mW/^\circ C$
- Operating Junction Temperature Range, $T_J = -65^\circ$ to $+200^\circ C$
- Storage Temperature Range, $T_{stg} = -65^\circ$ to $+200^\circ C$
- Thermal Resistance, Junction-to-Case, $R_{thJC} = 97^\circ C/W$
- Thermal Resistance, Junction-to-Ambient, $R_{thJA} = 350^\circ C/W$
- Lead Temperature (During Soldering, 1/16" from case, 60sec max), $T_L = 300^\circ C$

Dimensions	A	B	C	D	E	F	G	H	J	K	L
Min.	5.24	4.52	4.31	0.40	-	-	-	0.91	0.71	12.70	45°
Max.	5.84	4.97	5.33	0.53	0.76	1.27	2.97	1.17	1.21	-	

DISCLAIMER:
ALL STATEMENTS AND TECHNICAL INFORMATION CONTAINED HEREIN ARE BASED UPON INFORMATION AND/OR TESTS WE BELIEVE TO BE ACCURATE AND RELIABLE. SINCE CONDITIONS OF USE ARE BEYOND OUR CONTROL, THE USER SHALL DETERMINE THE SUITABILITY OF THE PRODUCT FOR THE INTENDED USE AND ASSUME ALL RISK AND LIABILITY WHATSOEVER IN CONNECTION THEREWITH.

TOLERANCES:

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE FOR REFERENCE PURPOSES ONLY.

DRAWN BY:

HISHAM ODISH

CHECKED BY:

JEFF MCVICKER

APPROVED BY:

JOHN COLE

DATE:

5/10/02

DATE:

2/20/04

DATE:

2/20/04

DRAWING TITLE:

Transistor, Bipolar, Metal, TO-18, NPN

SIZE

A

DWG. NO.

2N3700

ELECTRONIC FILE

35C0706.DWG

REV

B

SCALE: NTS

U.O.M.: Millimeters

SHEET: 1 OF 2

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ Unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Max	Unit
-----------	--------	-----------------	-----	-----	------

OFF Characteristics

Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 30\text{mA}, I_B = 0$	80	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	140	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	7	-	V
Collector Cut-Off Current	I_{CBO}	$V_{CB} = 90\text{V}, I_E = 0$	-	0.01	μA
		$V_{CB} = 90\text{V}, I_E = 0, T_A = +150^\circ\text{C}$	-	10	μA
Emitter Cut-Off Current	I_{EBO}	$V_{BE} = 5\text{V}, I_C = 0$	-	0.01	μA

ON Characteristics

DC Current Gain (Note 1)	h_{FE}	$V_{CE} = 10\text{V}, I_C = 0.1\text{mA}$	50	-	-
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	90	-	-
		$V_{CE} = 10\text{V}, I_C = 150\text{mA}$	100	300	-
		$V_{CE} = 10\text{V}, I_C = 150\text{mA}, T_A = -55^\circ\text{C}$	40	-	-
		$V_{CE} = 10\text{V}, I_C = 500\text{mA}$	50	-	-
		$V_{CE} = 10\text{V}, I_C = 1\text{A}$	15	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	0.2	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$	-	0.5	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{mA}, I_B = 15\text{mA}$	-	1.1	V

Small-Signal Characteristics

Current Gain-Bandwidth Product	f_T	$V_{CE} = 10\text{V}, I_C = 50\text{mA}, f = 20\text{MHz}$	100	400	MHz
Output Capacitance	C_{obo}	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	-	12	pF
Input Capacitance	C_{ibo}	$V_{BE} = 500\text{mV}, I_C = 0, f = 1\text{MHz}$	-	60	pF
Small-Signal Current Gain	h_{fe}	$V_{CE} = 5\text{V}, I_C = 1\text{mA}, f = 1\text{kHz}$	80	400	-
Collector-Base Time Constant	$r_b'C_c$	$V_{CB} = 10\text{V}, I_E = 10\text{mA}, f = 79.8\text{MHz}$	-	400	ps
Noise Figure	NF	$V_{CE} = 10\text{V}, I_C = 100\mu\text{A}, f = 1\text{kHz}, R_s = 1\text{kohm}$	-	4	dB

Note 1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$.