multicomp

SPC-F005.DWG

REVISIONS

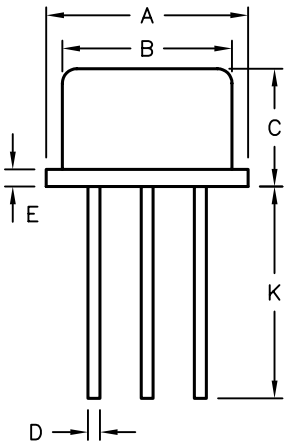
DOC. NO. SPC-F005 * Effective: 7/8/02 * DCP No: 1398

DCP #	REV	DESCRIPTION	DRAWN	DATE	CHECKD	DATE	APPRVD	DATE
1885	A	RELEASED	BYF	02/04/06	HO	2/6/06	JWM	2/6/06

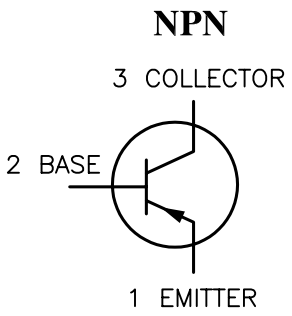
RoHS Compliant

Description:
A silicon NPN transistor in a TO-39 case intended for high speed switching applications.

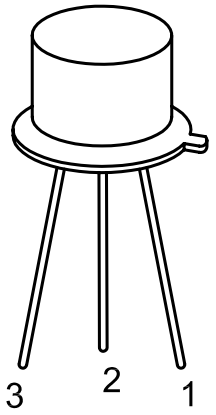
Absolute Maximum Ratings:
- Collector-Base Voltage, V_{CBO} = 75V
- Collector-Emitter Voltage, V_{CEO} = 40V
- Emitter-Base Voltage, V_{EBO} = 6V
- Continuous Collector Current, I_C = 800mA
- Total Device Dissipation (T_C = +25°C), P_D = 1.2W
  Derate above 25°C = 6.85mW/°C
- Total Device Dissipation(T_A = +25°C), P_D = 400mW
  Derate above 25°C = 2.28mW/°C
- Operating Junction Temperature Range, T_J = −65° to+200°C
- Storage Temperature Range, T_{stg} = −65° to +200°C

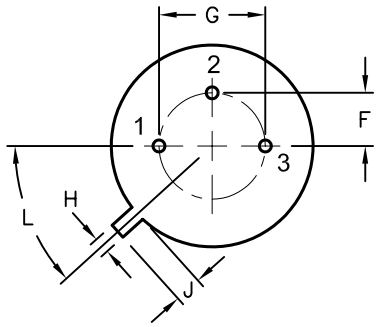


Dim	Min	Max
A	8.50	9.39
B	7.74	8.50
C	6.09	6.60
D	0.40	0.53
E	–	0.88
F	2.41	2.66
G	4.82	5.33
H	0.71	0.86
J	0.73	0.86
K	12.70	–
L	42°	48°



STYLE 1
PIN 1. EMITTER
2. BASE
3. COLLECTOR





TOLERANCES:
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE FOR REFERENCE PURPOSES ONLY.

DRAWN BY:	DATE:
BASAM YOUSIF	02/04/06
CHECKED BY:	DATE:
HISHAM ODISH	2/6/06
APPROVED BY:	DATE:
JEEF MCVICKER	2/6/06

DRAWING TITLE: Power Transistor, Silicon TO-39, NPN

SIZE	DWG. NO.	ELECTRONIC FILE	REV
A	2N2218A	35C0688.DWG	A

SCALE: NTS | U.O.M.: MILLIMETERS | SHEET: 1 OF 2

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

Parameter	Symbol	Test Conditions	Min	Max	Unit
OFF Characteristics					
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	40	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	75	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	6	–	V
Collector Cutoff Current	I_{CBO}	V_{CE} = 60V, I_E = 0	–	0.01	μA
		V_{CE} = 60V, I_E = 0, T_A = +150°C	–	10	μA
	I_{CEX}	V_{CE} = 60V, $V_{EB(off)}$ = 3V	–	10	nA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 3V, I_C = 0	–	10	nA
Base Cutoff Current	I_{BL}	V_{CE} = 60V, $V_{EB(off)}$ = 3V	–	20	nA
ON Characteristics					
DC Current Gain	h_{FE}	I_C = 0.1mA, V_{CE} = 10V	20	–	–
		I_C = 1mA, V_{CE} = 10V	25	–	–
		I_C = 10mA, V_{CE} = 10V	35	–	–
		I_C = 10mA, V_{CE} = 10V, T_A = −55°C	15	–	–
		I_C = 150mA, V_{CE} = 10V (Note 1)	40	120	–
		I_C = 150mA, V_{CE} = 1V (Note 1)	20	–	–
		I_C = 500mA, V_{CE} = 10V (Note 1)	25	–	–
Collector–Emitter Saturation Voltage (Note 1)	$V_{CE(sat)}$	I_C = 150mA, I_B = 5mA	–	0.3	V
		I_C = 500mA, I_B = 50mA	–	1	V
Base–Emitter Saturation Voltage (Note 1)	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	0.6	1.2	V
		I_C = 500mA, I_B = 50mA	–	2	V
Small-Signal Characteristics					
Current Gain–Bandwidth Product (Note 2)	f_T	I_C = 20mA, V_{CE} = 20V, f = 100MHz, (Note 2)	250	–	MHz
Output Capacitance	C_{obo}	V_{CB} = 10V, I_E = 0, f = 100kHz	–	8	pF
Input Capacitance	C_{ibo}	V_{EB} = 0.5V, I_C = 0, f = 100kHz	–	25	pF
Input Impedance	h_{ie}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	1	3.5	kOhm
		I_C = 10mA, V_{CE} = 10V, f = 1kHz	0.2	1	kOhm
Voltage Feedback Ratio	H_{re}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	–	5	$x10^{-4}$
		I_C = 10mA, V_{CE} = 10V, f = 1kHz	–	2.5	$x10^{-4}$
OUTPUT ADMITTANCE	h_{oe}	I_C = 1mA, V_{CE} = 10V, f = 1kHz	3	15	μmhos
		I_C = 10mA, V_{CE} = 10V, f = 1kHz	10	100	μmhos
Collector–Base Time Constant	rb'C_c	I_E = 20mA, V_{CB} = 20V, f = 31.8MHz	5	150	ps
Noise Figure	NF	I_C = 100μA, V_{CE} = 10V, R_S = 1k Ohm, f = 1kMHz	–	4	dB
Real Part of Common–Emitter High Frequency Input Impedance	Re(h_{ie})	I_C = 20mA, V_{CE} = 20V, f = 300MHz	–	60	Ohm
Switching Characteristics					
Delay Time	t_q	V_{CC} = 30V, I_C = 150mA, $V_{BE(off)}$ = 0.5V, I_{B1} = 15mA	–	10	ns
Rise Time	t_r		–	25	ns
Storage Time	t_s	V_{CC} = 30V, I_C = 150mA, I_{B1} = I_{B2} = 15mA	–	225	ns
Fall Time	t_f		–	60	ns
Active Region Time Constant	T_A	I_C = 150mA, V_{CE} = 30V	–	2.5	ns

Notes:
1. Pulse Test: Pulse Width ≦ 300ms, Duty Cycle ≦ 2%.
2. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.