2N2219AHR

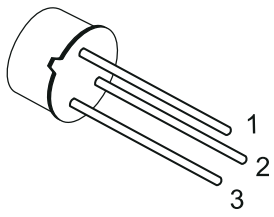
Hi-Rel NPN bipolar transistor 40 V, 0.8 A

Datasheet — production data

Features

BV_{CEO}	40 V
I_C (max)	0.8 A
H_{FE} at 10 V - 150 m	> 100
Operating temperature range	- 65 °C to + 200 °C

- Hi-Rel NPN bipolar transistor
- Linear gain characteristics
- ESCC qualified
- European preferred part list - EPPL
- Radiation level: lot specific total dose contact marketing for specified level



TO-39

Description

The 2N2219AHR is a silicon planar epitaxial NPN transistor in a TO-39 package. It is specifically designed for aerospace Hi-Rel applications, and ESCC qualified in accordance with the 5201-003 specification. In case of discrepancies between this datasheet and ESCC detailed specification, the latter prevails.

Figure 1. Internal schematic diagram

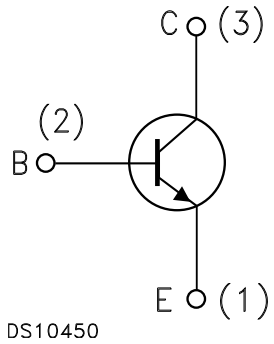


Table 1. Device summary

Order codes	Package	Lead finish	Marking	Type	EPPL	Packaging
2N2219AHR	TO-39	Gold Solder Dip	520100301 520100302	ESCC Flight	Yes	Strip pack
2N2219AT1	TO-39	Gold	2N2219AT1	Engineering model		Strip pack

1 Electrical ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base voltage (I_E = 0)	75	V
V_{CEO}	Collector-emitter voltage (I_B = 0)	40	V
V_{EBO}	Emitter-base voltage (I_C = 0)	6	V
I_C	Collector current	0.8	A
P_{TOT}	Total dissipation at $T_{amb} \leq 25°C$ Total dissipation at $T_c \leq 25°C$	0.8 3	W W
T_{STG}	Storage temperature	-65 to 200	°C
T_J	Max. operating junction temperature	200	°C

Table 3. Thermal data

Symbol	Parameter		Value	Unit
R_{thJC}	Thermal resistance junction-case	max	58	°C/W
R_{thJA}	Thermal resistance junction-ambient	max	218	°C/W

2 Electrical characteristics

T_{case} = 25 °C unless otherwise specified.

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 60 V V_{CB} = 60 V, T_{amb} = 150 °C		-	10 10	nA µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 3 V		-	10	nA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 10 µA	75	-		V
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA	40	-		V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 10 µA	6	-		V
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 150 mA, I_B = 15 mA I_C = 500 mA, I_B = 50 mA		-	0.3 1	V V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 150 mA, I_B = 15 mA		-	1.2	V
h_{FE} (1)	DC current gain	I_C = 10 mA, V_{CE} = 10 V I_C = 150 mA, V_{CE} = 10 V I_C = 500 mA, V_{CE} = 10 V I_C = 10 mA, V_{CE} = 10 V T_{amb} = -55 °C	75 100 40 35	-	300	
h_{fe}	Small signal current gain	V_{CE} = 20 V, I_C = 20 mA f = 100 MHz	2.5	-		
C_{CBO}	Output capacitance (I_E = 0)	V_{CB} = 10 V 100 kHz ≤ f ≤1 MHz		-	8	pF
t_{on}	Turn-on time	V_{CC} = 30 V, I_C = 150 mA I_{B1} = 15 mA		-	35	ns
t_{off}	Turn-off time	V_{CC} = 30 V, I_C = 150 mA I_{B1} = -I_{B2} = 15 mA		-	300	ns

1. Pulsed duration = 300 µs, duty cycle ≤2%

2.1 Electrical characteristics (curves)

Figure 2. DC current gain

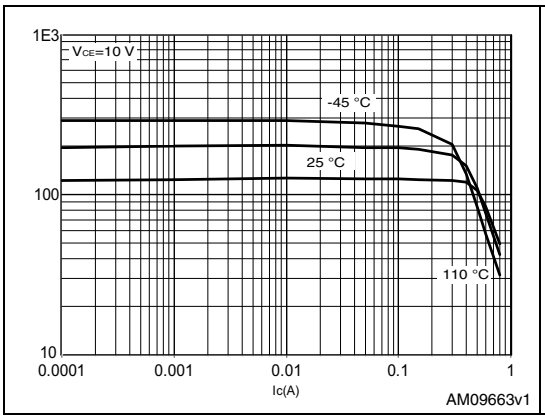


Figure 3. Collector emitter saturation voltage

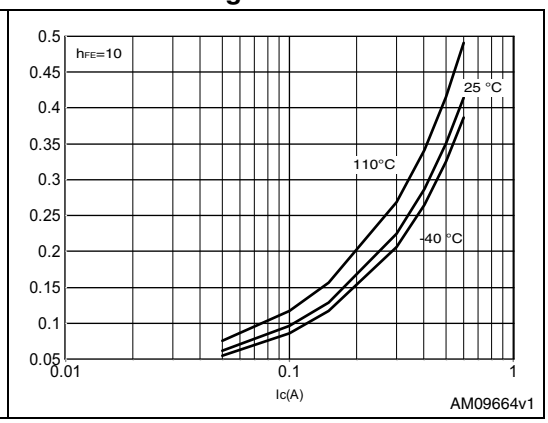
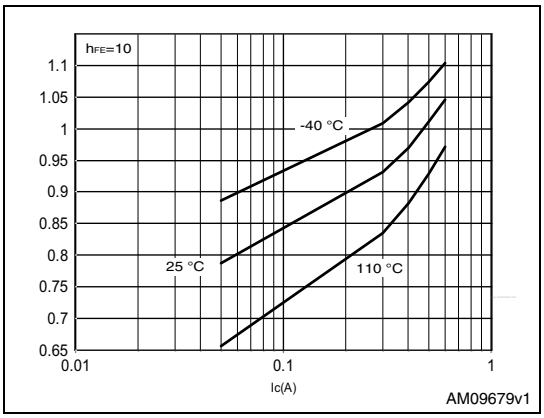
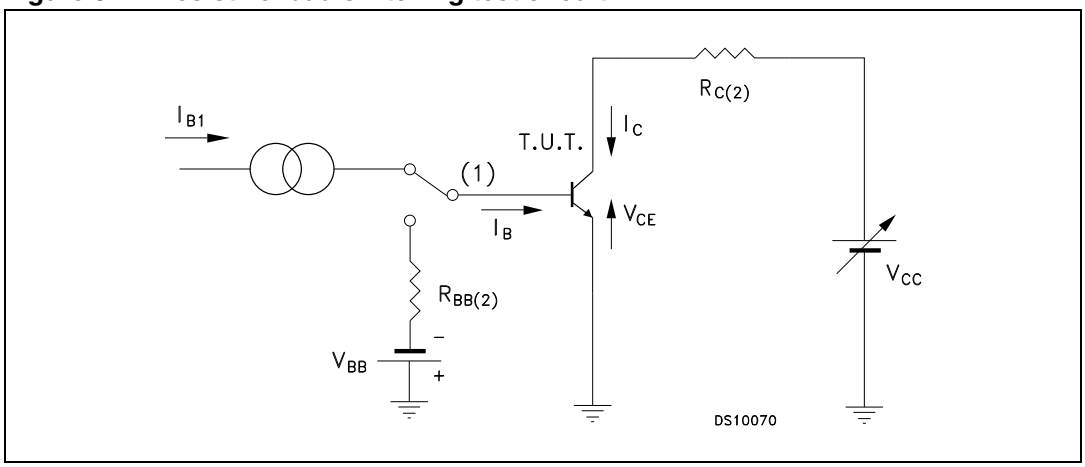


Figure 4. Base emitter saturation voltage



2.2 Test circuit

Figure 5. Resistive load switching test circuit



1. Fast electronic switch
2. Non-inductive resistor

3 Package mechanical data

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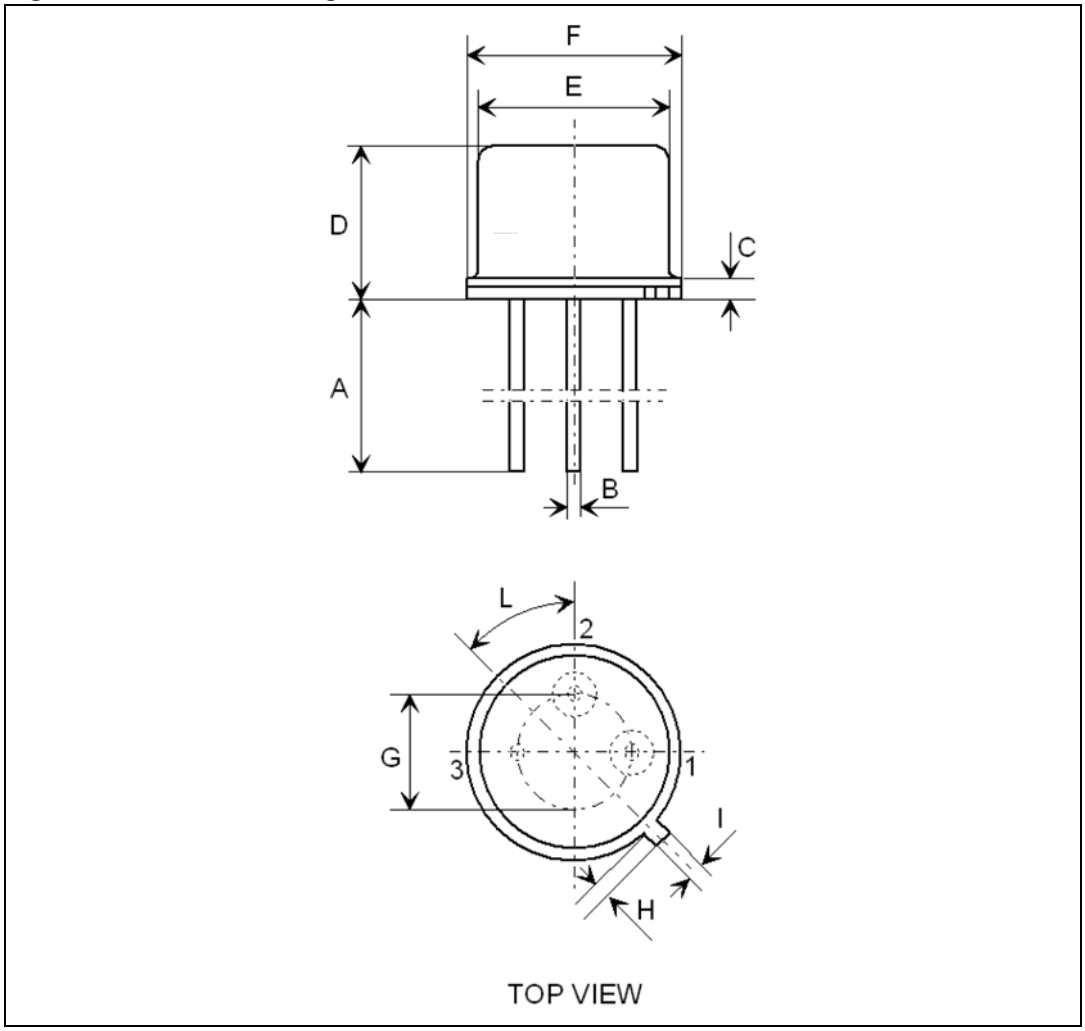
Table 5. TO-39 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	-	12.70	14.20
B		0.40	0.49
C		0.58	0.74
D		6.00	6.40
E		8.15	8.25
F		9.10	9.20
G		4.93	5.23
H		0.85	0.95
I		0.75	0.85
L		42°	48°

Figure 6. TO-39 drawing



4 Revision history

Table 6. Document revision history

Date	Revision	Changes
09-Jan-2009	1	Initial release
05-Jan-2010	2	Modified *Table 1 on page 1*
04-Oct-2012	3	Minor text changes. *Section 2.1: Electrical characteristics (curves)* has been added.

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