

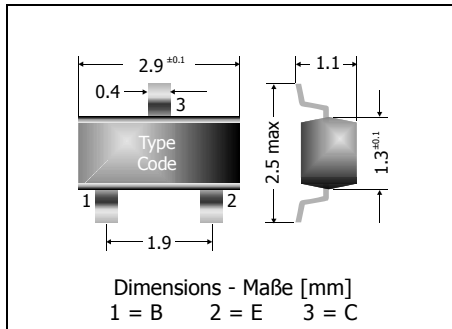
MMBT2369 / MMBT2369A

NPN

Surface Mount Si-Epi-Planar Switching Transistors
Si-Epi-Planar Schalttransistoren für die Oberflächenmontage

NPN

Version 2006-06-02



Power dissipation – Verlustleistung

250 mW

Plastic case
KunststoffgehäuseSOT-23
(TO-236)

Weight approx. – Gewicht ca.

0.01 g

Plastic material has UL classification 94V-0
Gehäusematerial UL94V-0 klassifiziertStandard packaging taped in ammo pack
Standard Lieferform getupet in Ammo-PackMaximum ratings ($T_A = 25^\circ\text{C}$)Grenzwerte ($T_A = 25^\circ\text{C}$)

			MMBT2369	MMBT2369A
Collector-Emitter-volt. – Kollektor-Emitter-Spannung	E-B short	V_{CES}	40 V	15 V
Collector-Emitter-volt. – Kollektor-Emitter-Spannung	B open	V_{CEO}	15 V	15 V
Collector-Base-voltage – Kollektor-Basis-Spannung	E open	V_{CBO}	40 V	40 V
Emitter-Base-voltage – Emitter-Basis-Spannung	C open	V_{EBO}	4.5 V	
Power dissipation – Verlustleistung		P_{tot}	250 mW ¹⁾	
Collector current – Kollektorstrom (dc)		I_C	200 mA	
Junction temperature – Sperrschichttemperatur		T_j	-55...+150°C	
Storage temperature – Lagerungstemperatur		T_s	-55...+150°C	

Characteristics ($T_j = 25^\circ\text{C}$)Kennwerte ($T_j = 25^\circ\text{C}$)

			Min.	Typ.	Max.
DC current gain – Kollektor-Basis-Stromverhältnis ²⁾					
$I_C = 10\text{ mA}, V_{CE} = 1\text{ V}$ $I_C = 100\text{ mA}, V_{CE} = 2\text{ V}$	MMBT2369	h_{FE}	40	–	120
		h_{FE}	20	–	–
$I_C = 10\text{ mA}, V_{CE} = 1\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 0.35\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 0.35\text{ V}, T_j = -55^\circ\text{C}$ $I_C = 30\text{ mA}, V_{CE} = 0.4\text{ V}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}$	MMBT2369A	h_{FE}	–	–	120
		h_{FE}	40	–	–
		h_{FE}	20	–	–
		h_{FE}	30	–	–
		h_{FE}	20	–	–
Collector-Emitter saturation voltage – Kollektor-Emitter-Sättigungsspg. ²⁾					
$I_C = 10\text{ mA}, I_B = 1\text{ mA}$	MMBT2369	V_{CESat}	–	–	0.25 V
$I_C = 10\text{ mA}, I_B = 1\text{ mA}$ $I_C = 10\text{ mA}, I_B = 1\text{ mA}, T_j = 125^\circ\text{C}$ $I_C = 30\text{ mA}, I_B = 3\text{ mA}$ $I_C = 100\text{ mA}, I_B = 10\text{ mA}$	MMBT2369A	V_{CESat}	–	–	0.20 V
		V_{CESat}	–	–	0.30 V
		V_{CESat}	–	–	0.25 V
		V_{CESat}	–	–	0.50 V

1 Mounted on P.C. board with 3 mm² copper pad at each terminal
Montage auf Leiterplatte mit 3 mm² Kupferbelag (Löt-pad) an jedem Anschluss

2 Tested with pulses $t_p = 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$ – Gemessen mit Impulsen $t_p = 300\text{ }\mu\text{s}$, Schaltverhältnis $\leq 2\%$

Characteristics ($T_j = 25^\circ\text{C}$)Kennwerte ($T_j = 25^\circ\text{C}$)

		Min.	Typ.	Max.	
Base-Emitter saturation voltage – Basis-Emitter-Sättigungsspannung ²⁾					
$I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$	MMBT2369A	V_{BEsat}	0.7 V	–	0.85 V
$I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$, $T_j = -55^\circ\text{C}$		V_{BEsat}	–	–	1.02 V
$I_C = 30\text{ mA}$, $I_B = 3\text{ mA}$		V_{BEsat}	–	–	1.15 V
$I_C = 100\text{ mA}$, $I_B = 10\text{ mA}$		V_{BEsat}	–	–	1.60 V
Collector-Base cutoff current – Kollektor-Basis-Reststrom					
$V_{CB} = 20\text{ V}$, (E open)		I_{CBO}	–	–	0.4 μA
$V_{CB} = 20\text{ V}$, $T_j = 125^\circ\text{C}$, (E open)		I_{CBO}	–	–	30 μA
Collector-Emitter cutoff current – Kollektor-Emitter-Reststrom					
$V_{CE} = 20\text{ V}$, (B-E short)	MMBT2369A	I_{CES}	–	–	0.4 μA
Collector-Emitter breakdown voltage	$I_C = 10\text{ }\mu\text{A}$	$V_{(BR)CES}$	40 V	–	–
Collector-Emitter breakdown voltage ²⁾	$I_C = 10\text{ mA}$	$V_{(BR)CEO}$	15 V	–	–
Collector-Base breakdown voltage	$I_C = 10\text{ }\mu\text{A}$	$V_{(BR)CBO}$	40 V	–	–
Emitter-Base-breakdown voltage	$I_C = 10\text{ }\mu\text{A}$	$V_{(BR)EBO}$	4.5 V	–	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität					
$V_{CB} = 5\text{ V}$, $I_E = i_e = 0$, $f = 1\text{ MHz}$		C_{CBO}	–	–	4 pF
Small signal current gain – Kleinsignal-Stromverstärkung					
$V_{CE} = 10\text{ V}$, $I_C = 10\text{ mA}$, $f = 100\text{ MHz}$		h_{fe}	5	–	–
Switching times – Schaltzeiten					
storage time	$I_{B1} = I_{B2} = I_C = 10\text{ mA}$	t_s	–	5 ns	13 ns
turn-on time	$V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 3\text{ mA}$	t_{on}	–	8 ns	12 ns
turn-off time	$V_{CC} = 3\text{ V}$, $I_C = 10\text{ mA}$, $I_{B1} = 3\text{ mA}$, $I_{B2} = 1.5\text{ mA}$	t_{off}	–	10 ns	18 ns
Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft		R_{thA}	< 420 K/W ¹⁾		
Marking - Stempelung		MMBT2369 = 1J MMBT2369A = 1JA			

²⁾ Tested with pulses $t_p = 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$ – Gemessen mit Impulsen $t_p = 300\text{ }\mu\text{s}$, Schaltverhältnis $\leq 2\%$

¹⁾ Mounted on P.C. board with 3 mm² copper pad at each terminal
Montage auf Leiterplatte mit 3 mm² Kupferbelag (Lötpad) an jedem Anschluss