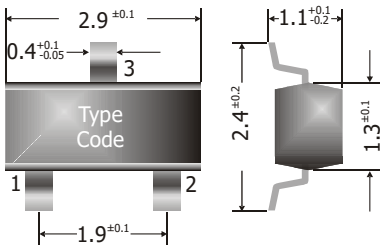
Diotec Semiconductor

MMBT4403
SMD General Purpose PNP Transistors
SMD Universal-PNP-Transistoren

I_C = -600 mA **V_{CEO} = -150 V**
h_{FE} = 100 ... 300 **P_{tot} = 250 mW**
T_{jmax} = 150°C

Version 2018-01-17

SOT-23 (TO-236)



1 = B 2 = E 3 = C

Dimensions - Maße [mm]

Typical Applications
Signal processing,
Switching, Amplification
Commercial grade [1])

Typische Anwendungen
Signalverarbeitung,
Schalten, Verstärken
Standardausführung [1])

Features
High collector-emitter voltage
Compliant to RoHS, REACH,
Conflict Minerals [1])

Besonderheiten
Hohe Kollektor-Emitter-Spannung
Konform zu RoHS, REACH,
Konfliktmineralien [1])

Mechanical Data [1])		**Mechanische Daten [1])**
Taped and reeled	3000 / 7"	Gegurtet auf Rolle
Weight approx.	0.01 g	Gewicht ca.
Case material	UL 94V-0	Gehäusematerial
Solder & assembly conditions	260°C/10s MSL = 1	Löt- und Einbaubedingungen

Type Code	**Recommended complementary NPN transistors Empfohlene komplementäre NPN-Transistoren**
MMBT4403 = 2T	MMBT4401

Maximum ratings [2]) **Grenzwerte [2])**

Collector-Emitter-voltage - Kollektor-Emitter-Spannung	B open	$-V_{CEO}$	40 V
Collector-Base-voltage - Kollektor-Basis-Spannung	E open	$-V_{CBO}$	40 V
Emitter-Base-voltage - Emitter-Basis-Spannung	C open	$-V_{EBO}$	5 V
Power dissipation – Verlustleistung		P_{tot}	250 mW [3])
Collector current – Kollektorstrom	DC	$-I_C$	600 mA
Junction temperature – Sperrschichttemperatur Storage temperature – Lagerungstemperatur		T_j T_S	-55...+150°C -55...+150°C

Characteristics **Kennwerte**

(T_j = 25°C)		**Min.**	**Typ.**	**Max.**
DC current gain – Kollektor-Basis-Stromverhältnis [4])				
$-I_C$ = 0.1 mA, $-V_{CE}$ = 1 V	h_{FE}	30	–	–
$-I_C$ = 1 mA, $-V_{CE}$ = 1 V		60	–	–
$-I_C$ = 10 mA, $-V_{CE}$ = 1 V		100	–	–
$-I_C$ = 150 mA, $-V_{CE}$ = 2 V		100	–	300
$-I_C$ = 500 mA, $-V_{CE}$ = 2 V		20	–	–

1 Please note the detailed information on our website or at the beginning of the data book
Bitte beachten Sie die detaillierten Hinweise auf unserer Internetseite bzw. am Anfang des Datenbuches
2 T_A = 25°C unless otherwise specified – T_A = 25°C wenn nicht anders angegeben
3 Mounted on P.C. board with 3 mm² copper pad at each terminal
Montage auf Leiterplatte mit 3 mm² Kupferbelag (Lötpad) an jedem Anschluss
4 Tested with pulses t_p = 300 µs, duty cycle ≤ 2% – Gemessen mit Impulsen t_p = 300 µs, Schaltverhältnis ≤ 2%

Characteristics **Kennwerte**

(T_j = 25°C)		Min.	Typ.	Max.
h-Parameters at/bei - V_{CE} = 10 V, - I_C = 1 mA, f = 1 kHz				
Small signal current gain – Kleinsignal-Stromverstärkung	h_{fe}	60	–	500
Input impedance – Eingangs-Impedanz	h_{ie}	1.5 kΩ	–	15 kΩ
Output admittance – Ausgangs-Leitwert	h_{oe}	1 µS	–	30 µS
Reverse voltage transfer ratio – Spannungsrückwirkung	h_{re}	$0.1*10^{-4}$	–	$8*10^{-4}$
Collector-Emitter saturation voltage – Kollektor-Emitter-Sättigungsspg. [1]				
- I_C = 150 mA, - I_B = 15 mA	- V_{CEsat}	–	–	0.40 V
- I_C = 500 mA, - I_B = 50 mA		–	–	0.75 V
Base-Emitter saturation voltage – Basis-Emitter-Sättigungsspannung [1]				
- I_C = 150 mA, - I_B = 15 mA	- V_{BEsat}	0.75 V	–	0.95 V
- I_C = 500 mA, - I_B = 50 mA		–	–	1.3 V
Collector-Emitter cutoff current – Kollektor-Emitter-Reststrom				
- V_{CE} = 35 V, - V_{EB} = 0.4 V	- I_{CEX}	–	–	100 nA
Emitter-Base cutoff current – Emitter-Basis-Reststrom				
- V_{CE} = 35 V, - V_{EB} = 0.4 V	- I_{EBV}	–	—	100 nA
Gain-Bandwidth Product – Transitfrequenz				
- I_C = 20 mA, - V_{CE} = 10 V, f = 100 MHz	f_T	200 MHz	–	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität				
- V_{CB} = 5 V, I_E = i_e = 0, f = 1 MHz	C_{CBO}	–	–	8.5 pF
Emitter-Base Capacitance – Emitter-Basis-Kapazität				
- V_{EB} = 0.5 V, I_C = i_c = 0, f = 1 MHz	C_{EBO}	–	–	30 pF
Switching times – Schaltzeiten (between 10% and 90% levels)				
delay time	t_d	–	–	15 ns
rise time	t_r	–	–	20 ns
storage time	t_s	–	–	225 ns
fall time	t_f	–	–	30 ns
Thermal resistance junction to ambient Wärmewiderstand Sperrschicht – Umgebung	R_{thA}	< 420 K/W [2]		

- delay time, rise time, storage time, fall time: - I_{Con} = 10 mA, - I_{Bon} = 1 mA, I_{Boff} = 1 mA

1 Tested with pulses t_p = 300 µs, duty cycle ≤ 2% – Gemessen mit Impulsen t_p = 300 µs, Schaltverhältnis ≤ 2%
2 Mounted on P.C. board with 3 mm² copper pad at each terminal
Montage auf Leiterplatte mit 3 mm² Kupferbelag (Lötpad) an jedem Anschluss

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