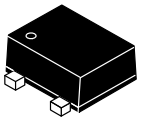
Bipolar Transistor

30 V, 0.7 A, Low $V_{CE(sat)}$, NPN Single MCPH3

30C02MH



MCPH3
CASE 419AQ

Features

- Large Current Capacity
- Low Collector−to−Emitter Saturation Voltage (Resistance): $R_{CE\ (sat)}$ typ. = 330 mΩ [I_C = 0.7 A, I_B = 35 mA]
- Ultrasmall Package Facilitates Miniaturization in End Products
- Small ON−Resistance (Ron)
- This is a Pb−Free Device

Applications

- Low−Frequency Amplifier
- High−Speed Switching
- Small Motor Drive

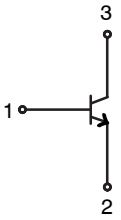
Specifications

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Symbol	Rating	Condition	Value	Unit
V_{CBO}	Collector−to−Base Voltage		40	V
V_{CEO}	Collector−to−Emitter Voltage		30	V
V_{EBO}	Emitter−to−Base Voltage		5	V
I_C	Collector Current		700	mA
I_{CP}	Collector Current (Pulse)		1.4	A
P_C	Collector Dissipation	When mounted on ceramic substrate (600 mm^2 x 0.8 mm)	600	mW
Tj	Junction Temperature		150	°C
Tstg	Storage Temperature		−55 to +150	°C

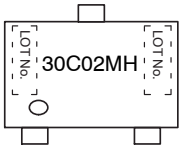
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

ELECTRICAL CONNECTION



1: Base
2: Emitter
3: Collector

MARKING DIAGRAM



30C02MH = Device Code

ORDERING INFORMATION

Device	Package	Shipping†
30C02MH−TL−E	MCPH3 (Pb-Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

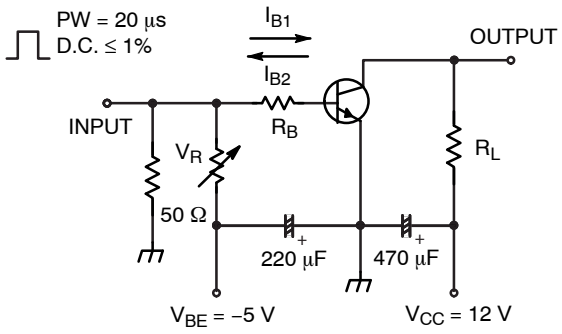
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	Collector Cutoff Current	V_{CB} = 30 V, I_E = 0 A	–	–	100	nA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 4 V, I_C = 0 A	–	–	100	nA
h_{FE}	DC Current Gain	V_{CE} = 2 V, I_C = 50 mA	300	–	800	
f_T	Gain−Bandwidth Product	V_{CE} = 10 V, I_C = 50 mA	–	540	–	MHz
Cob	Output Capacitance	V_{CB} = 10 V, f = 1 MHz	–	3.3	–	pF
V_{CE}(sat)	Collector−to−Emitter Saturation Voltage	I_C = 200 mA, I_B = 10 mA	–	85	190	mV
V_{BE}(sat)	Base−to−Emitter Saturation Voltage	I_C = 200 mA, I_B = 10 mA	–	0.9	1.2	V
$V_{(BR)CBO}$	Collector−to−Base Breakdown Voltage	I_C = 10 μA, I_E = 0 A	40	–	–	V
$V_{(BR)CEO}$	Collector−to−Emitter Breakdown Voltage	I_C = 1 mA, R_{BE} = ∞	30	–	–	V
$V_{(BR)EBO}$	Emitter−to−Base Breakdown Voltage	I_E = 10 μA, I_C = 0 A	5	–	–	V
t_{on}	Turn−On Time	See specified Test Circuit		35	–	ns
t_{stg}	Storage Time			255	–	ns
t_f	Fall Time			40	–	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

Switching Time Test Circuit



$I_C = 20I_{B1} = -20I_{B2}$ = 300 mA

Figure 1. Switching Time Test Circuit

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TYPICAL CHARACTERISTICS

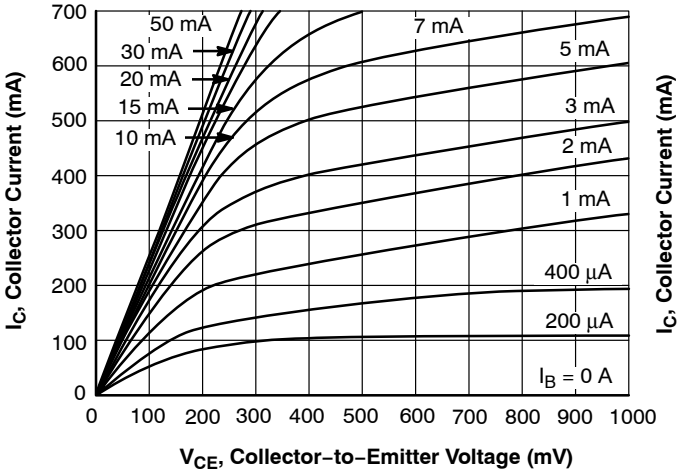


Figure 2. $I_C - V_{CE}$

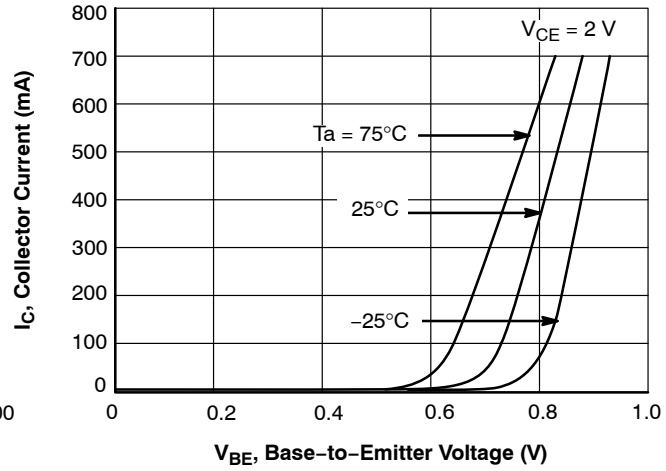


Figure 3. $I_C - V_{BE}$

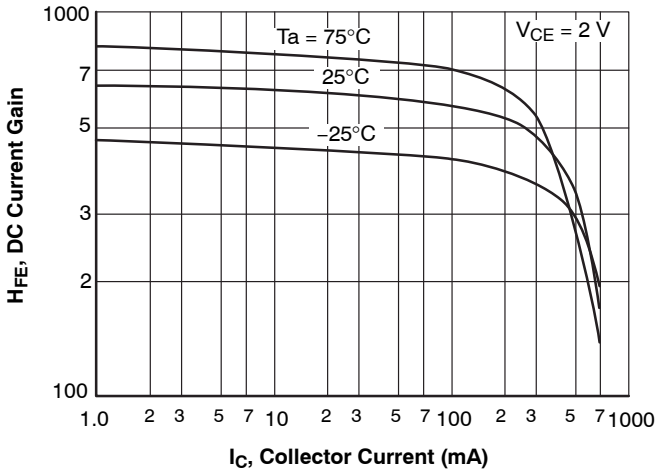


Figure 4. $h_{FE} - I_C$

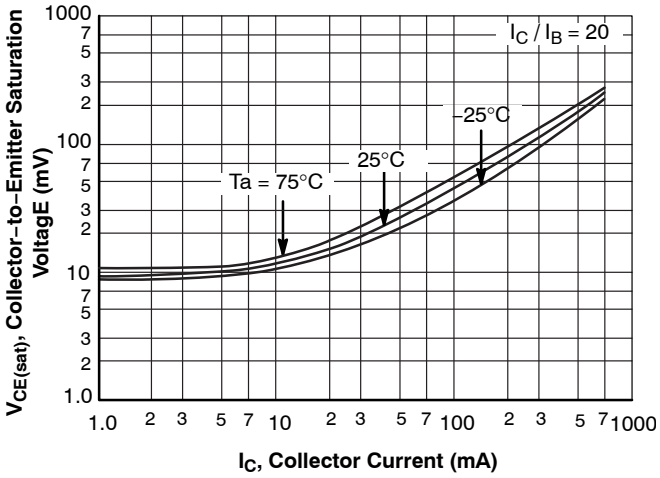


Figure 5. $V_{CE(sat)} - I_C$

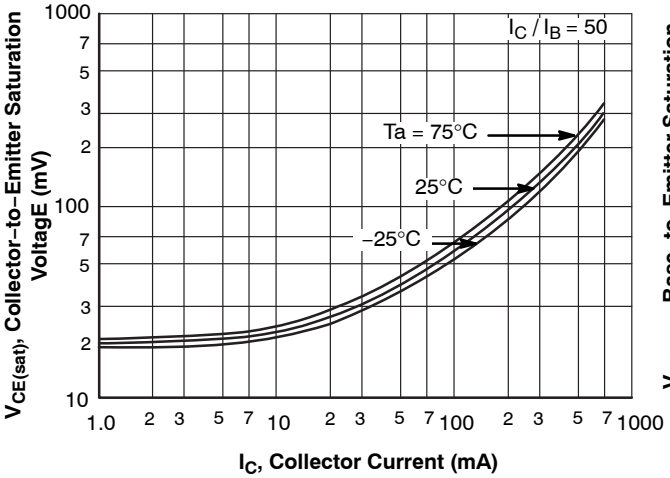


Figure 6. $V_{CE(sat)} - I_C$

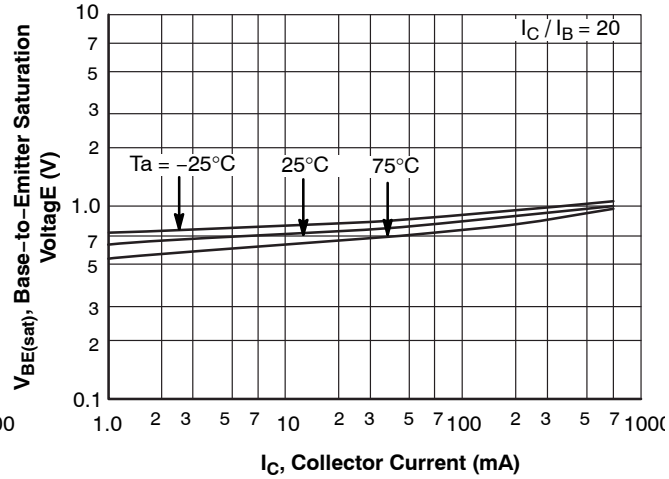


Figure 7. $V_{BE(sat)} - I_C$

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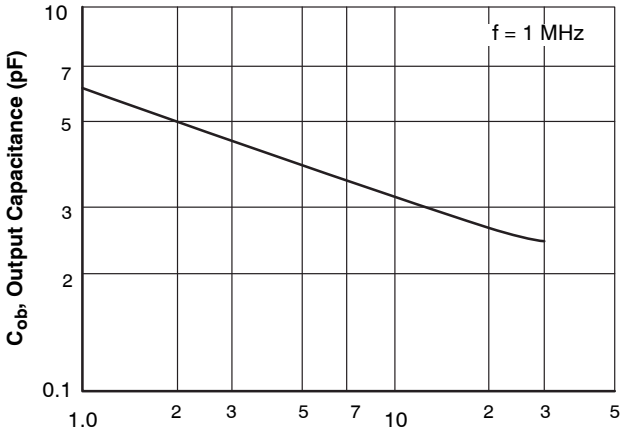


Figure 9. C_{ob} – V_{CB}

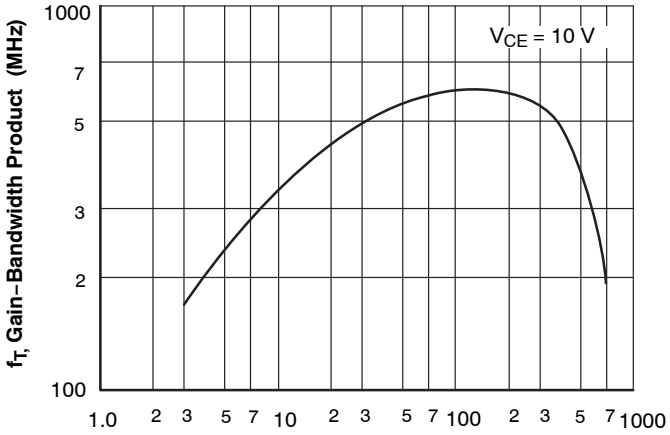


Figure 8. f_T – I_C

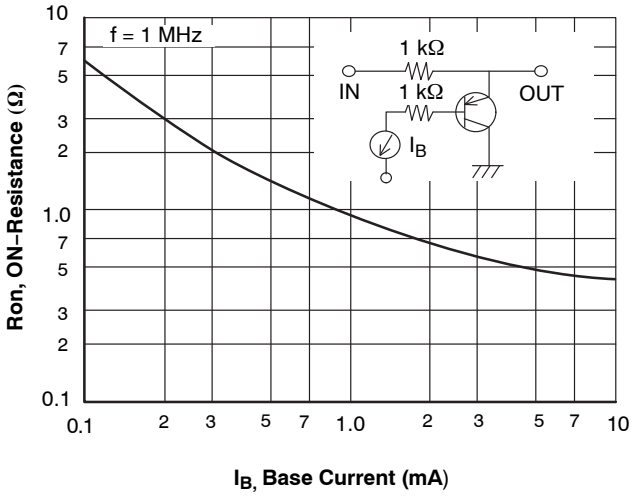


Figure 10. Ron – I_B

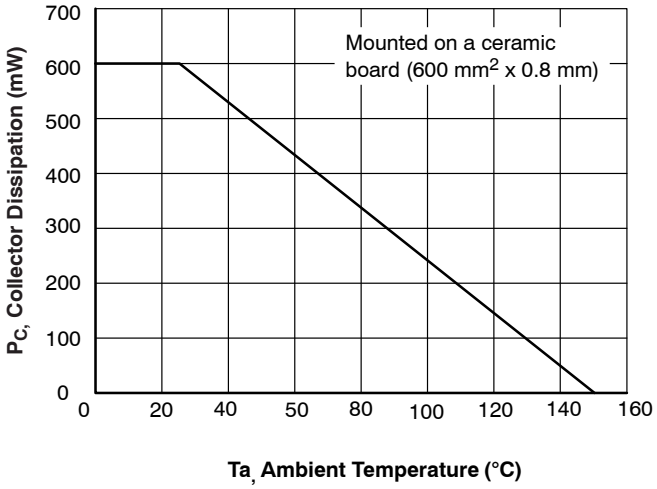
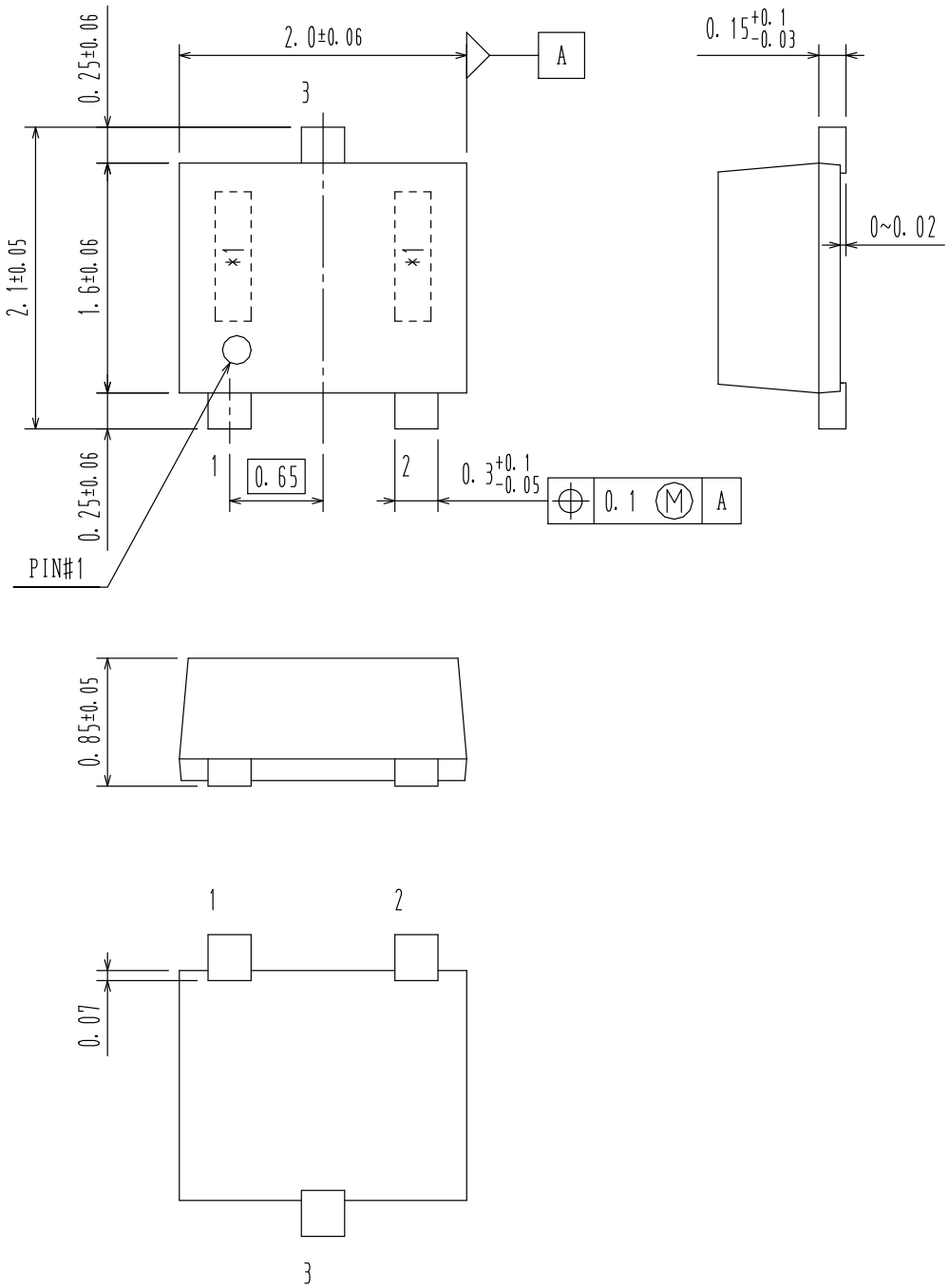


Figure 11. P_C – Ta

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