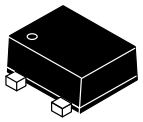
Bipolar Transistor

–12 V, –1 A, Low $V_{CE(sat)}$ PNP Single MCPH3

12A02MH



MCPH3
CASE 419AQ

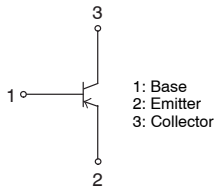
Features

- Large Current Capacity
- Low Collector−To−Emitter Saturation Voltage (Resistance) $R_{CE\ (sat)}$ typ. = 285 mΩ [I_C = 1 A, I_B = 50 mA]
- Small ON−Resistance (Ron)
- This Device is Pb−Free

Applications

- Low−Frequency Amplifier, High−Speed Switching, Small Motor Drive, Muting Circuit

ELECTRICAL CONNECTION



MARKING DIAGRAM

AK = Device Code

ABSOLUTE MAXIMUM RATINGS

(Values are at T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector−Base Voltage		−15	V
V_{CEO}	Collector−Emitter Voltage		−12	V
V_{EBO}	Emitter−Base Voltage		−5	V
I_C	Collector Current		−1	A
I_{CP}	Collector Current (Pulse)		−2	A
P_C	Collector Dissipation	When mounted on ceramic substrate (600 mm^2 × 0.8 mm)	600	mW
T_J	Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		−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.

ORDERING INFORMATION

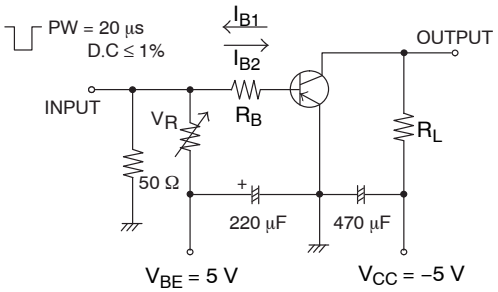
Device	Package	Shipping†
12A02MH−TL−E	MCPH3 (Pb-Free)	3000 / Tape & Reel

†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.

ELECTRICAL CHARACTERISTICS (Values are at T_A = 25°C unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	Collector Cut−Off Current	V_{CB} = −12 V, I_E = 0 A	–	–	−100	nA
I_{EBO}	Emitter Cut−Off Current	V_{EB} = −4 V, I_C = 0 A	–	–	−100	nA
h_{FE}	DC Current Gain	V_{CE}= −2 V, I_C = −10 mA	300	–	700	–
f_T	Gain−Bandwidth Product	V_{CE} = −2 V, I_C = −50 mA	–	450	–	MHz
C_{ob}	Output Capacitance	V_{CB} = −10 V, f = 1 MHz	–	6	–	pF
V_{CE}(sat)	Collector−Emitter Saturation Voltage	I_C = −400 mA, I_B = −20 mA	–	−120	−240	mV
V_{BE}(sat)	Base−Emitter Saturation Voltage	I_C = −400 mA, I_B = −20 mA	–	−0.9	−1.2	V
$V_{(BR)CBO}$	Collector−to−Base Breakdown Voltage	I_C = −10 μA, I_E = 0 A	−15	–	–	V
$V_{(BR)CEO}$	Collector−to−Emitter Breakdown Voltage	I_C = −1 mA, R_{BE} = ∞	−12	–	–	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 Figure. 1	–	30	–	ns
t_{stg}	Storage Time		–	75	–	ns
t_f	Fall Time		–	15	–	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.



I_C = 20 I_{B1} = −20 I_{B2} = −400 mA

Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

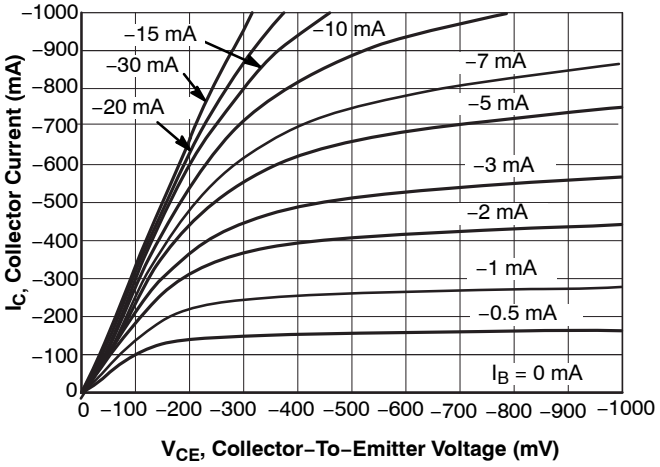


Figure 2. $I_C - V_{CE}$

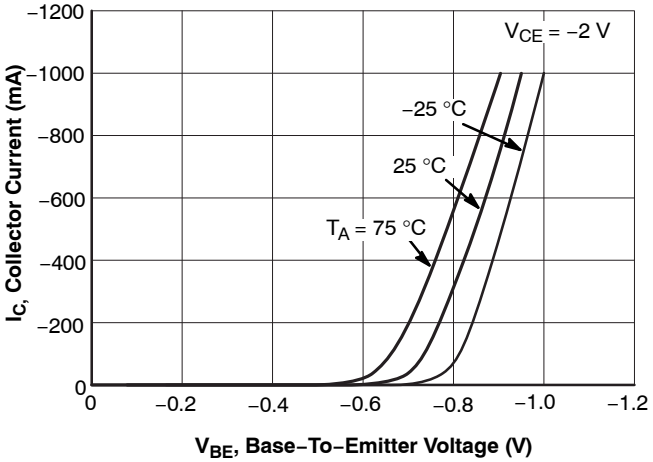


Figure 3. $I_C - V_{BE}$

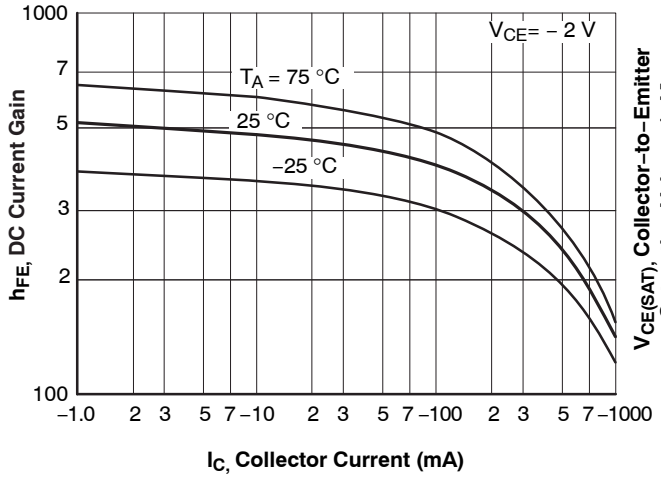


Figure 4. $h_{FE} - I_C$

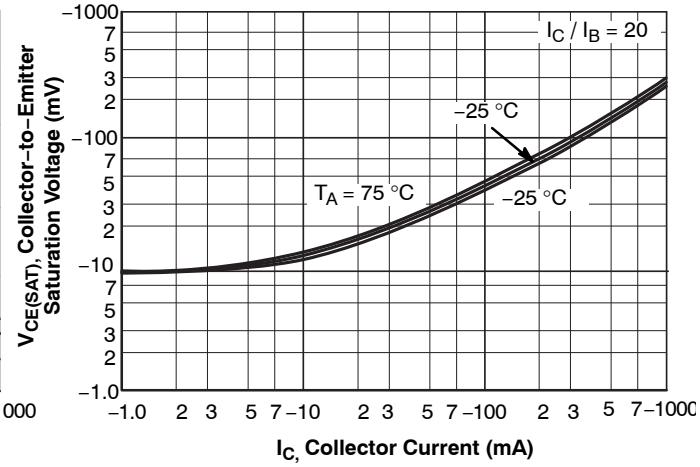


Figure 5. $V_{CE(sat)} - I_C$

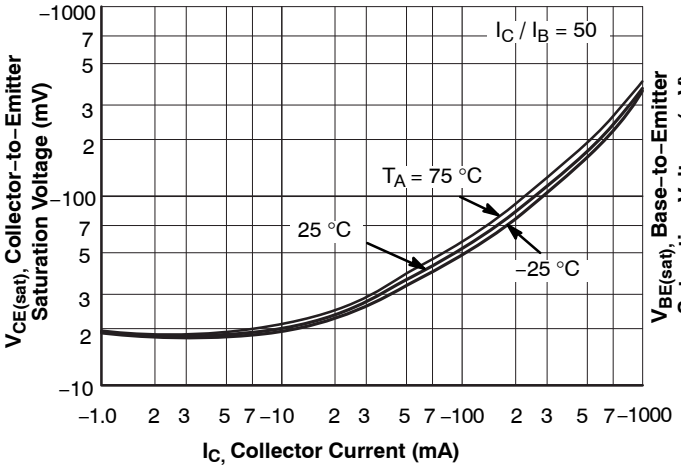


Figure 6. $V_{CE(sat)} - I_C$

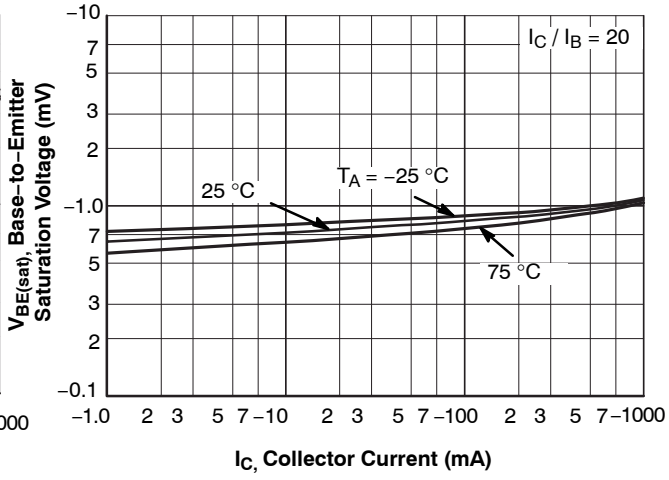


Figure 7. $V_{BE(sat)} - I_C$

TYPICAL CHARACTERISTICS (continued)

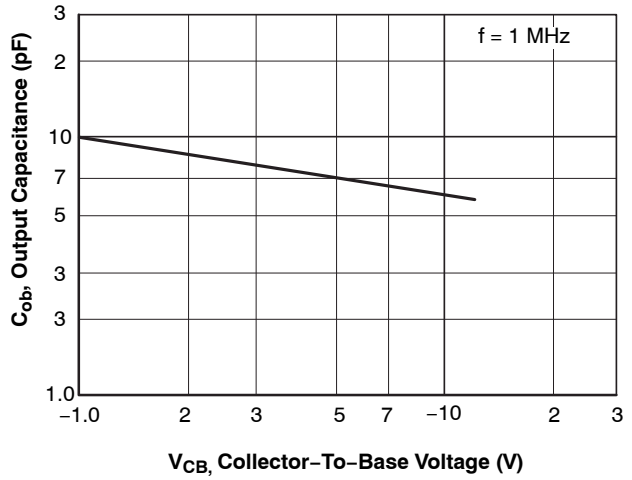


Figure 9. C_{ob} – V_C

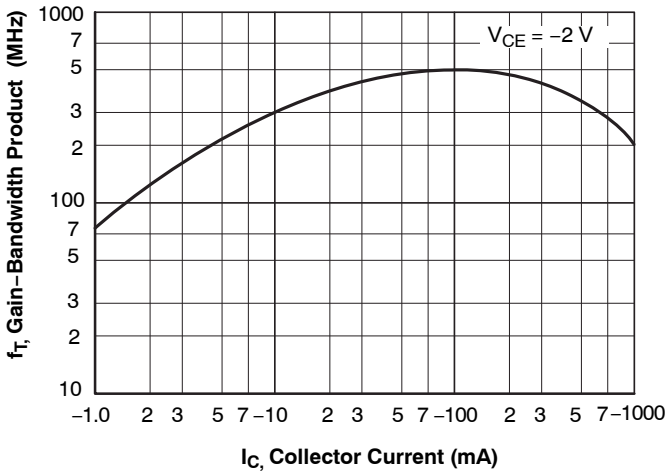


Figure 8. f_T – I_C

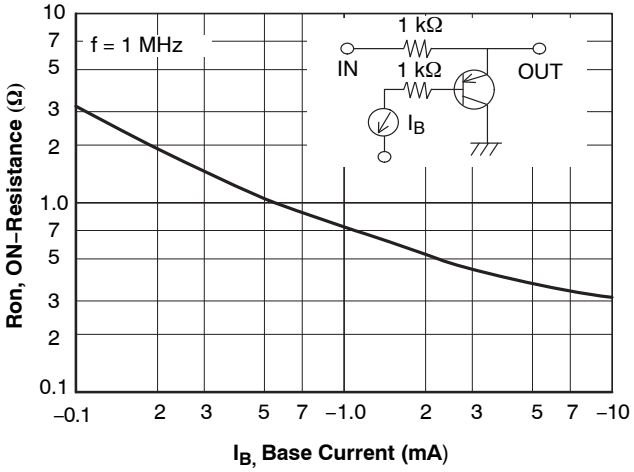


Figure 10. Ron – I_B

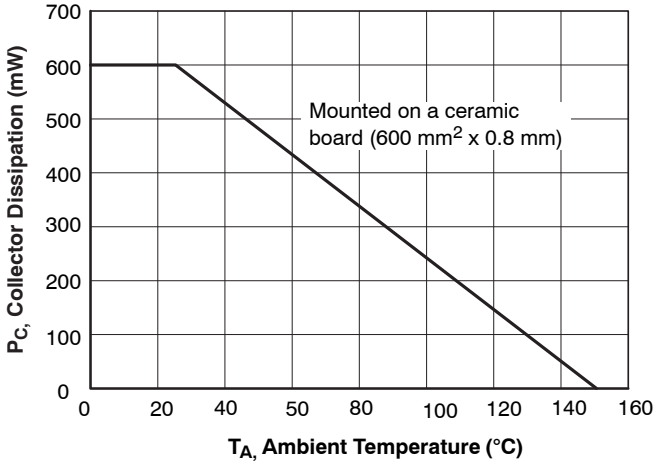


Figure 11. P_C – T_A

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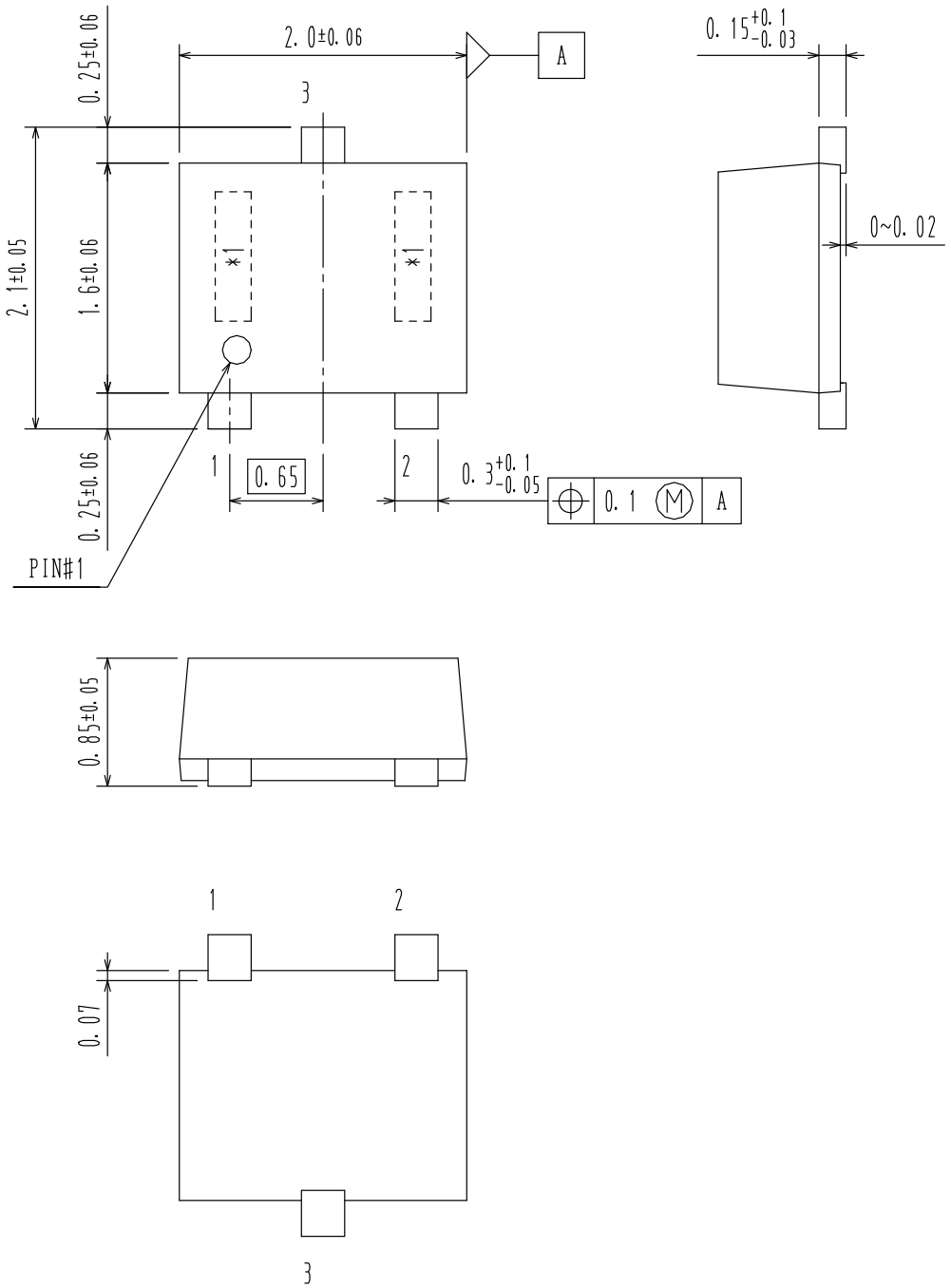

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