

Bipolar Transistor

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

30C02MH

Features

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

Applications

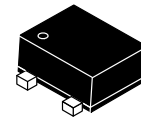
- Low-Frequency Amplifier
- High-Speed Switching
- Small Motor Drive

Specifications

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

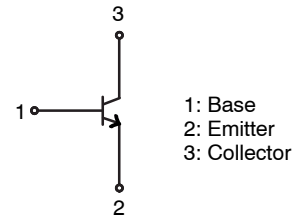
Symbol	Rating	Condition	Value	Unit
V_{CBO}	Collector-to-Base Voltage		40	V
V_{CEO}	Collector-to-Emitter Voltage		30	V
V_{EBO}	Emitter-to-Base Voltage		5	V
I_C	Collector Current		700	mA
I_{CP}	Collector Current (Pulse)		1.4	A
P_C	Collector Dissipation	When mounted on ceramic substrate (600 mm ² x 0.8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

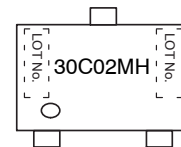


MCPH3
CASE 419AQ

ELECTRICAL CONNECTION



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](#).

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{CBO}	Collector Cutoff Current	$V_{CB} = 30 \text{ V}, I_E = 0 \text{ A}$	–	–	100	nA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 4 \text{ V}, I_C = 0 \text{ A}$	–	–	100	nA
h_{FE}	DC Current Gain	$V_{CE} = 2 \text{ V}, I_C = 50 \text{ mA}$	300	–	800	
f_T	Gain-Bandwidth Product	$V_{CE} = 10 \text{ V}, I_C = 50 \text{ mA}$	–	540	–	MHz
C_{ob}	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	–	3.3	–	pF
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage	$I_C = 200 \text{ mA}, I_B = 10 \text{ mA}$	–	85	190	mV
$V_{BE(sat)}$	Base-to-Emitter Saturation Voltage	$I_C = 200 \text{ mA}, I_B = 10 \text{ mA}$	–	0.9	1.2	V
$V_{(BR)CBO}$	Collector-to-Base Breakdown Voltage	$I_C = 10 \mu\text{A}, I_E = 0 \text{ A}$	40	–	–	V
$V_{(BR)CEO}$	Collector-to-Emitter Breakdown Voltage	$I_C = 1 \text{ mA}, R_{BE} = \infty$	30	–	–	V
$V_{(BR)EBO}$	Emitter-to-Base Breakdown Voltage	$I_E = 10 \mu\text{A}, I_C = 0 \text{ A}$	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

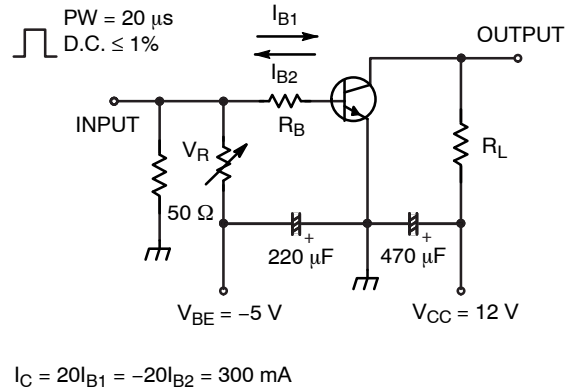
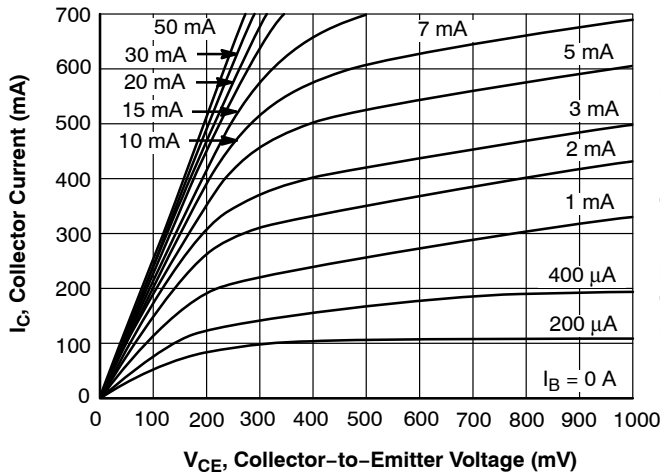
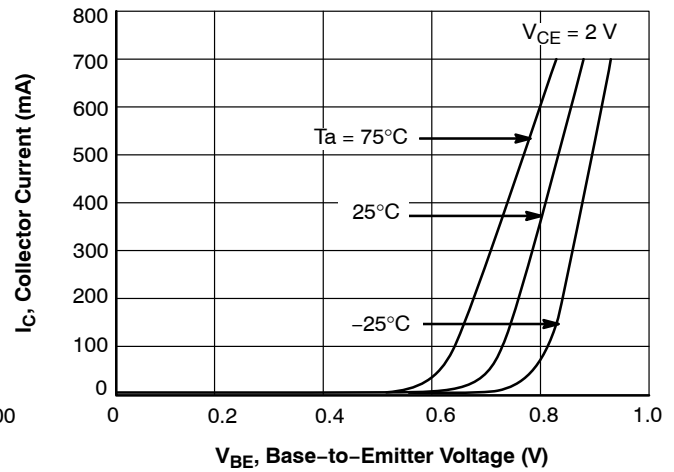
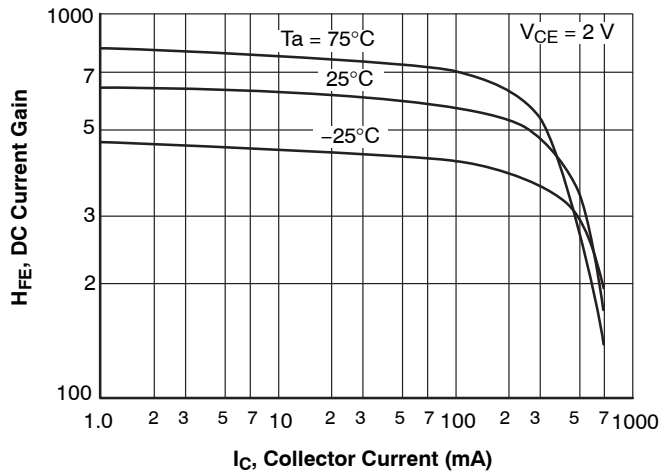
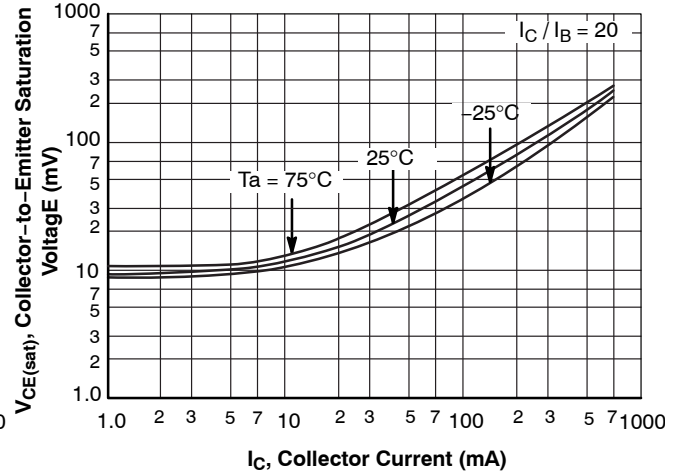
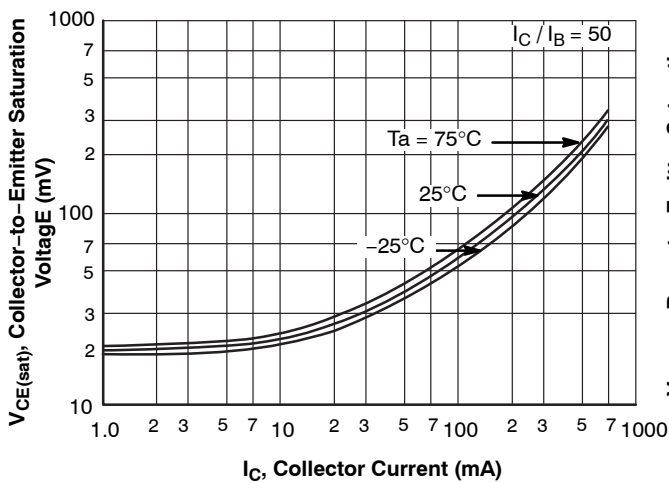
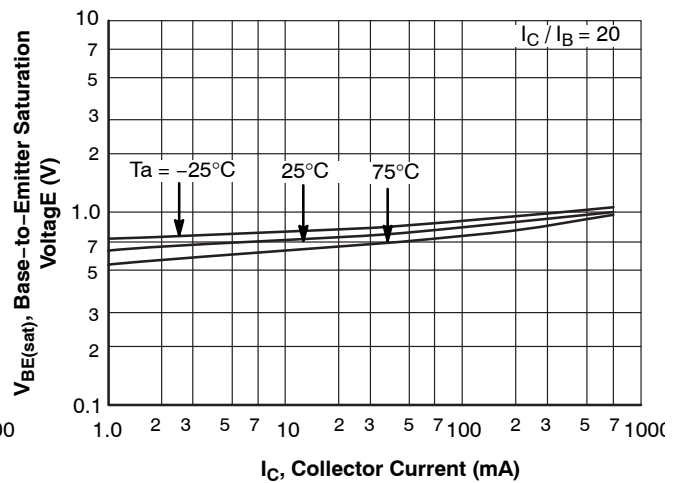


Figure 1. Switching Time Test Circuit

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

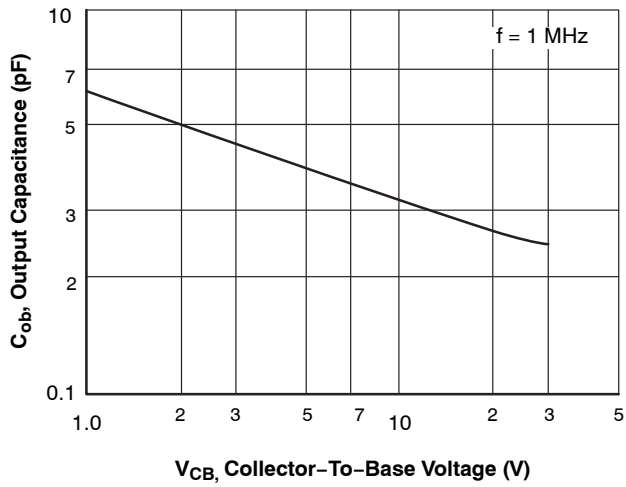


Figure 9. $C_{ob} - V_{CB}$

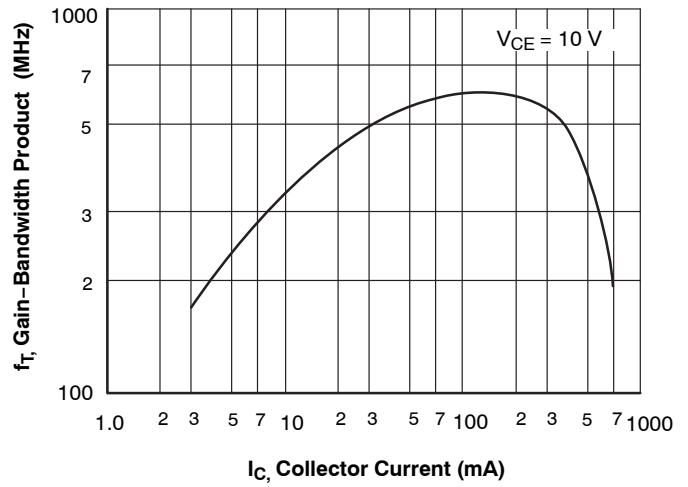


Figure 8. $f_T - I_C$

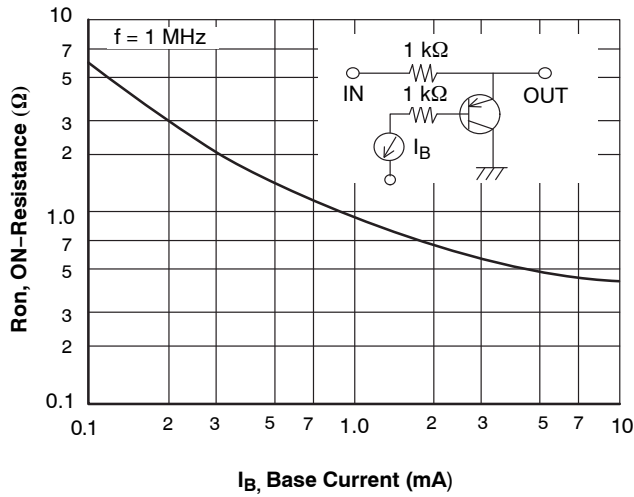


Figure 10. $R_{on} - I_B$

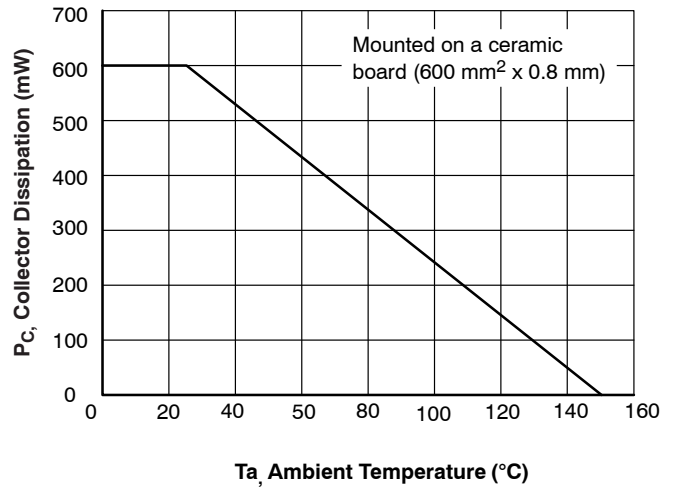
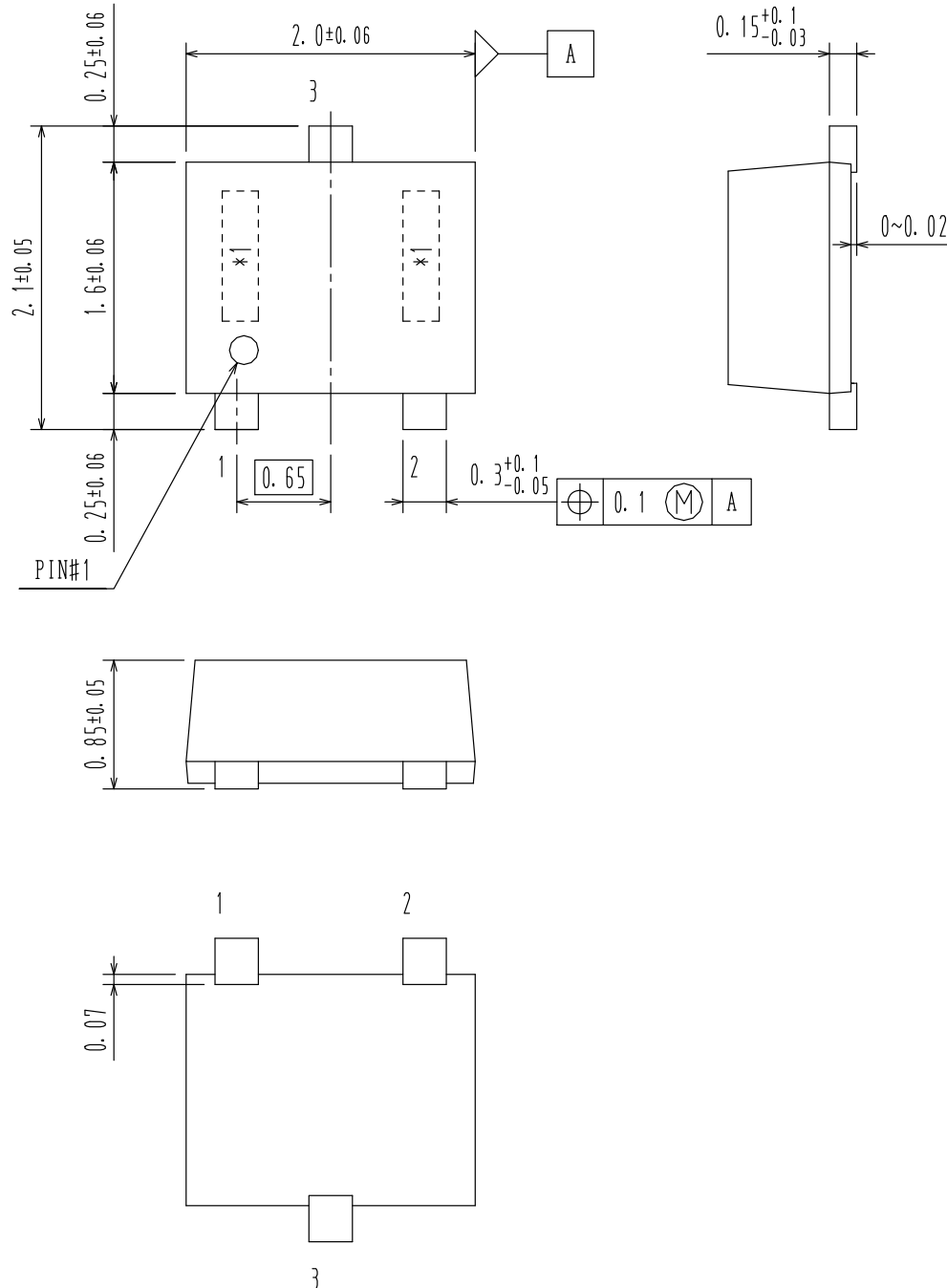


Figure 11. $P_C - T_a$

SC-70FL / MCPH3
CASE 419AQ
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