

Bipolar Transistor

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

12A02MH

Features

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

Applications

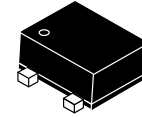
- Low-Frequency Amplifier, High-Speed Switching, Small Motor Drive, Muting Circuit

ABSOLUTE MAXIMUM RATINGS

(Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

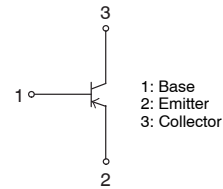
Symbol	Parameter	Conditions	Ratings	Unit
V_{CBO}	Collector-Base Voltage		-15	V
V_{CEO}	Collector-Emitter Voltage		-12	V
V_{EBO}	Emitter-Base Voltage		-5	V
I_C	Collector Current		-1	A
I_{CP}	Collector Current (Pulse)		-2	A
P_C	Collector Dissipation	When mounted on ceramic substrate (600 mm ² × 0.8 mm)	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.

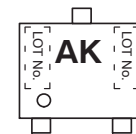


MCPH3
 CASE 419AQ

ELECTRICAL CONNECTION



MARKING DIAGRAM



AK = Device Code

ORDERING INFORMATION

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

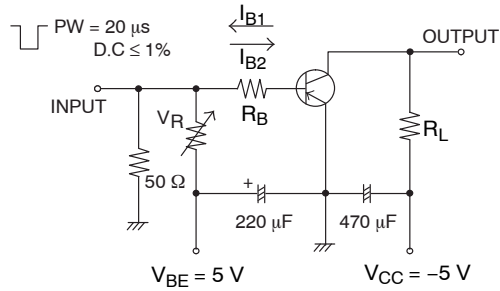
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

12A02MH

ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

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



$$I_C = 20\text{ mA}, I_{B1} = -20\text{ mA}, I_{B2} = -400\text{ mA}$$

Figure 1. Switching Time Test Circuit

TYPICAL CHARACTERISTICS

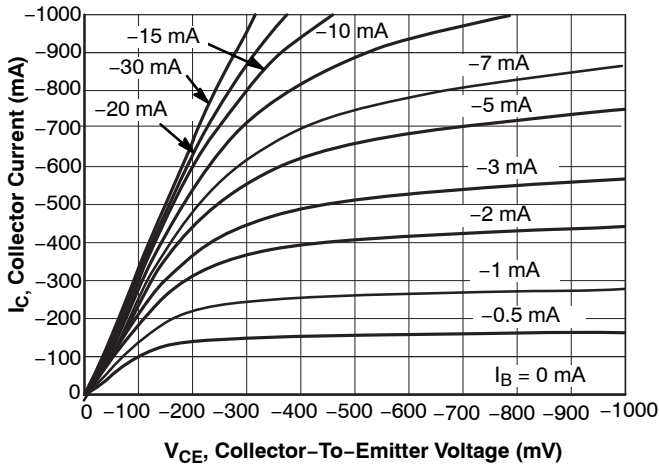


Figure 2. $I_C - V_{CE}$

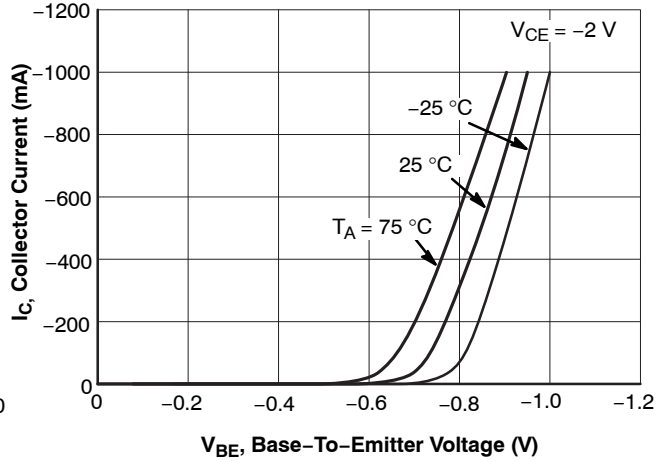


Figure 3. $I_C - V_{BE}$

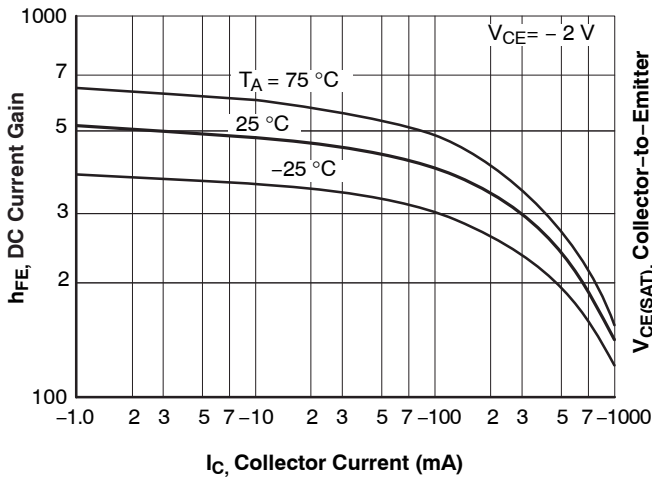


Figure 4. $h_{FE} - I_C$

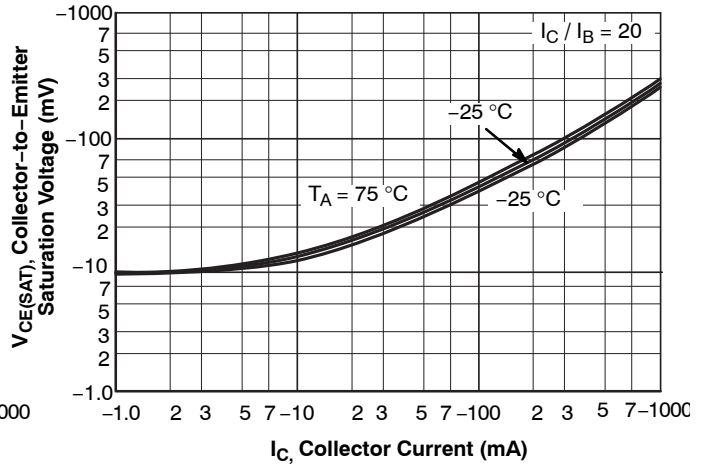


Figure 5. $V_{CE(sat)} - I_C$

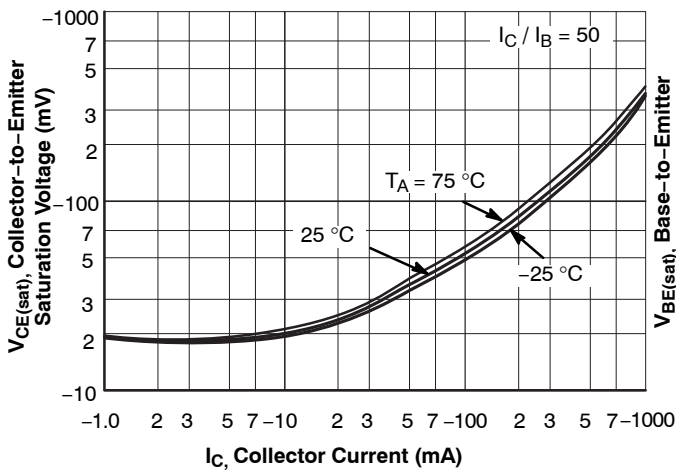


Figure 6. $V_{CE(sat)} - I_C$

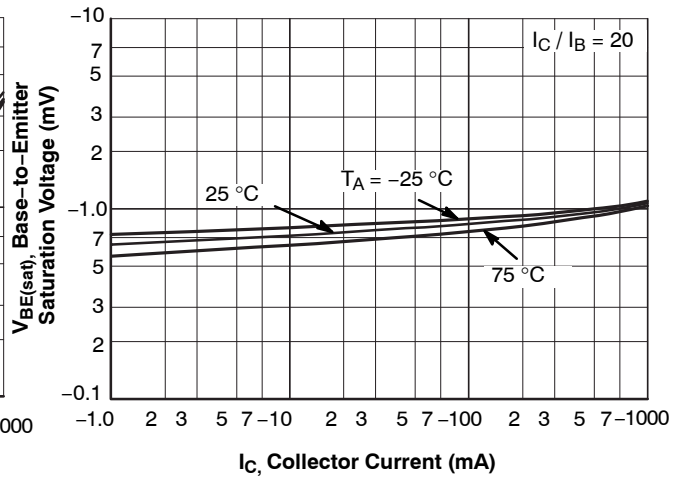
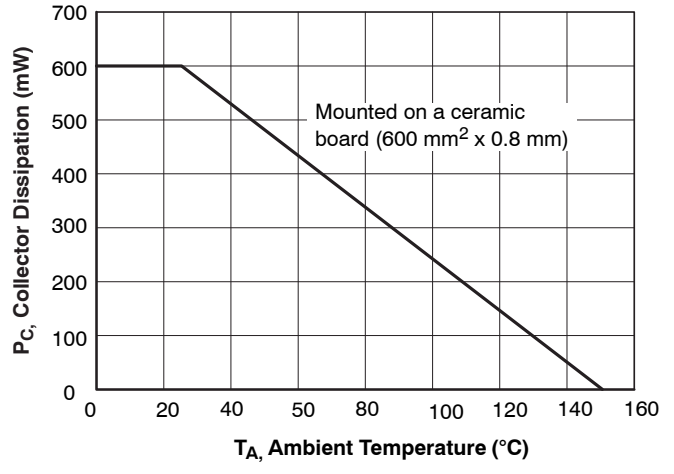
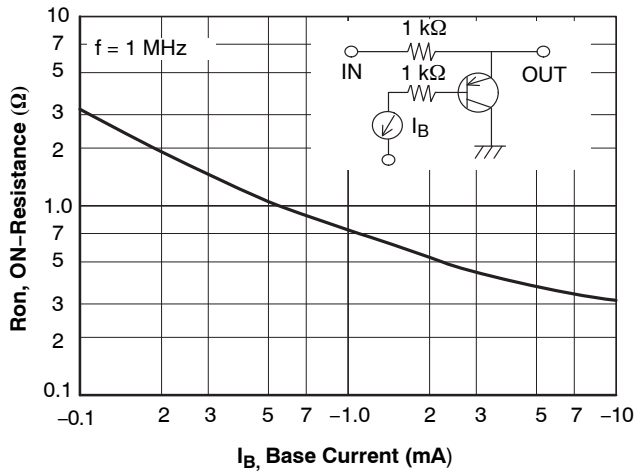
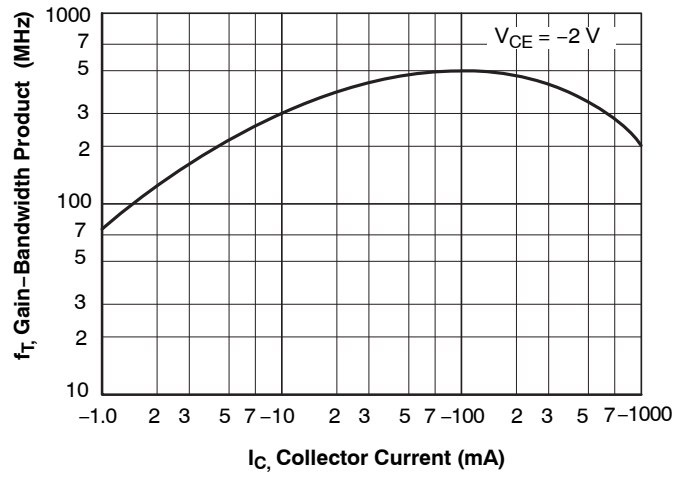
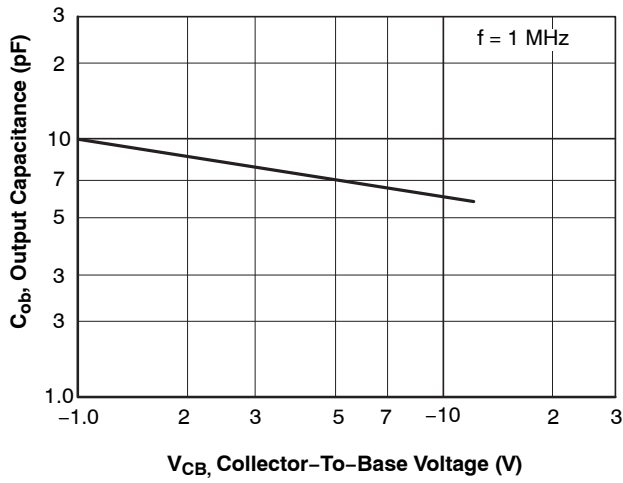


Figure 7. $V_{BE(sat)} - I_C$

TYPICAL CHARACTERISTICS (continued)



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