Ordering number : ENA2043

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

Monolithic Linear IC

LA6586FA — BTL Driver Single-Phase Full-Wave Fan Motor Driver

Overview

The LA6586FA is Single-phase bipolar fan motor is put into silent driving by means of BTL output linear drive, offering high efficiency and power saving by suppressing the reactive current. Lock protection and rotation signal (FG, RD) circuits are built in, ensuring optimum application to small fans for notebook PC, consumer equipment power supply, car audio system, CPU cooler, etc. that require high reliability and low noise.

Functions

- Single-phase full-wave linear drive by BTL output (gain resistance 1kΩ-360kΩ, 51dB)
- Low-voltage operation possible, with wide operating voltage range (2.2 to 14.0V)
- Low saturation output (Upper + lower saturation voltage : Vosat (total)=1.2Vtyp, I_O=200mA)
- Built-in lock protection and automatic reset circuits
- Built-in FG&RD outputs
- Built-in Hall bias (VHB=1.3V)
- Thermal protection circuit
- Extra-small package (Micro10)

Specitications

Absolute Maximum Ratings at Ta = 25 °C

Parameter	Symbol	Conditions	Ratings	Unit
Output voltage	V_{CC} max		15	V
Allowable power dissipation	Pd max	Mounted on a specified board*	400	mW
Output current	I_{OUT} max		0.6	A
Output withstand voltage	V_{OUT} max		15	V
RD/FG output pin output withstand voltage	VRD/FG max		15	V
RD/FG output current	IRD/FG max		10	mA
HB output current	IB max		10	mA
Operating temperature	Topr		-30 to +90	°C
Storage temperature	Tstg		-55 to +150	°C

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*Mounted on a specified board : 20mm×10mm×0.8mm, paper phenol
Caution 1) Absolute maximum ratings represent the value which cannot be exceeded for any length of time.
Caution 2) Even when the device is used within the range of absolute maximum ratings, as a result of continuous usage under high temperature, high current, high voltage, or drastic temperature change, the reliability of the IC may be degraded. Please contact us for the further details.

Recommended Operating Range at Ta = 25 °C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.2 to 14.0	V
Common-phase input voltage range of Hall input	VICM		0 to V_{CC}-1.5	V

Electrical Characteristics at Ta = 25 °C, V_{CC} = 12 V

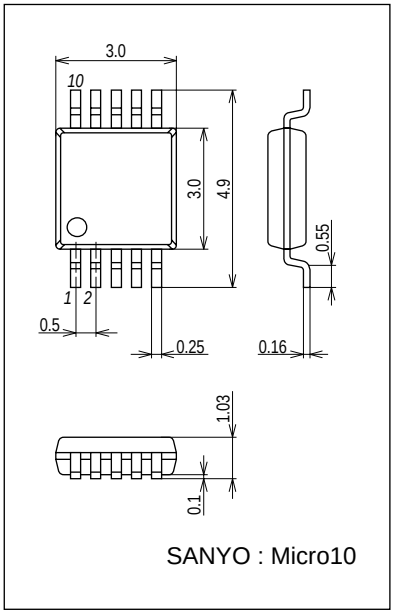
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Circuit current	$I_{CC}1$	During drive (CT = L)	3	6	9	mA
	$I_{CC}2$	During lock protection (CT = H)	2.5	5	7.5	mA
Lock detection capacitor charge current	ICT1		0.9	1.2	1.5	μA
Capacitor discharge current	ICT2		0.10	0.18	0.25	μA
Capacitor charge and discharge current ratio	RCT	RCT = ICT1/ICT2	5	6.5	8	-
CT charge voltage	VCT1		1.3	1.5	1.7	V
CT discharge voltage	VCT2		0.3	0.5	0.7	V
OUT output L saturation voltage	VOL	I_O = 200 mA		0.25	0.45	V
OUT output H saturation voltage	VOH	I_O = 200 mA		0.95	1.2	V
Input offset voltage	VOFST			3	6	mV
Hall input sensitivity	VHN	Zero peak value (including offset and hysteresis)		7	15	mV
Hall bias output L voltage	VHB	IHB = 5 mA	1.3	1.5	1.7	V
RD/FG input pin L voltage	VFG	IRD/FG = 5 mA		0.15	0.3	V
RD/FG input pin leak current	IFGL	VRD/FG = 15 V		1	30	μA
Overheat protection circuit	TSD	(*1) Designed target value	150	180	210	°C

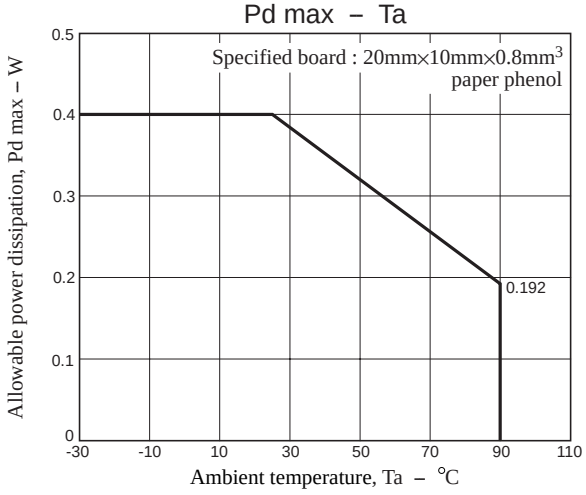
(*1) The standard is a design target and the measurement with a single unit is not made.

Package Dimensions

unit : mm

3428

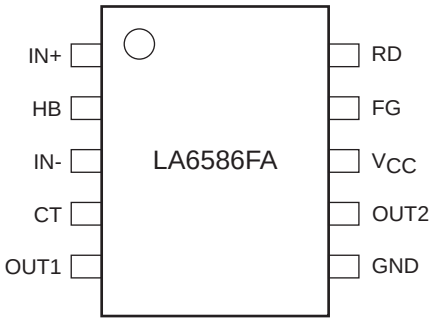




Truth Table

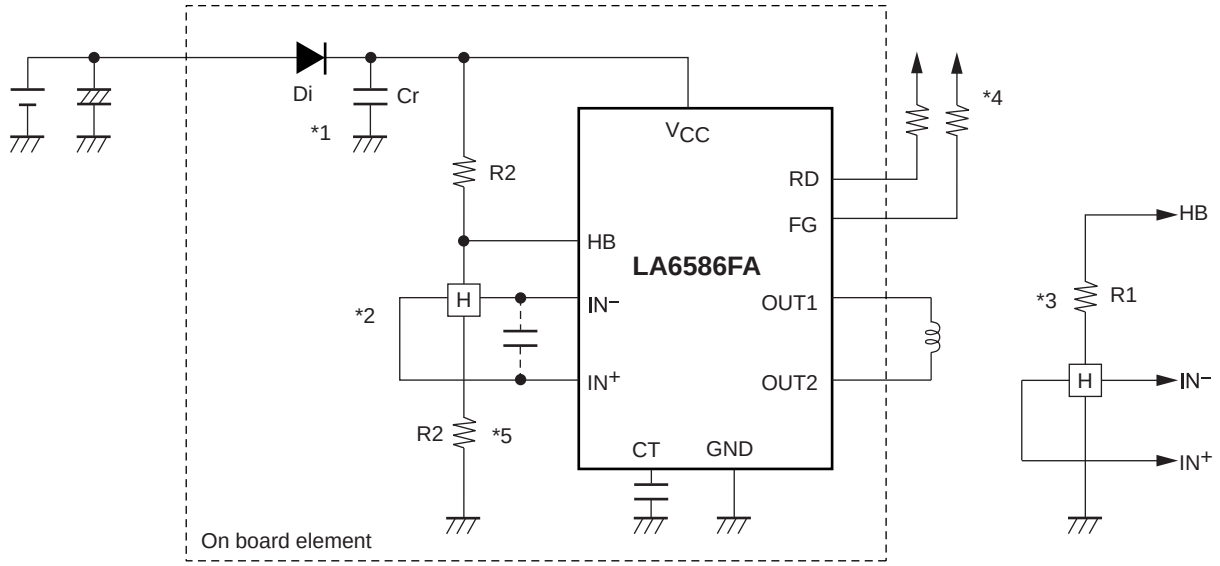
IN-	IN+	CT	OUT1	OUT2	FG	RD	Mode
H	L	L	H	L	L	L	During rotation
L	H		L	H	H		
-	-	H	OFF	OFF	-	H	During overheat protection

Pin Assignment



(Top view)

Sample Application Circuit



*1 To enhance the reliability, it is necessary to insert a capacitor Cr to secure the regenerative current route.

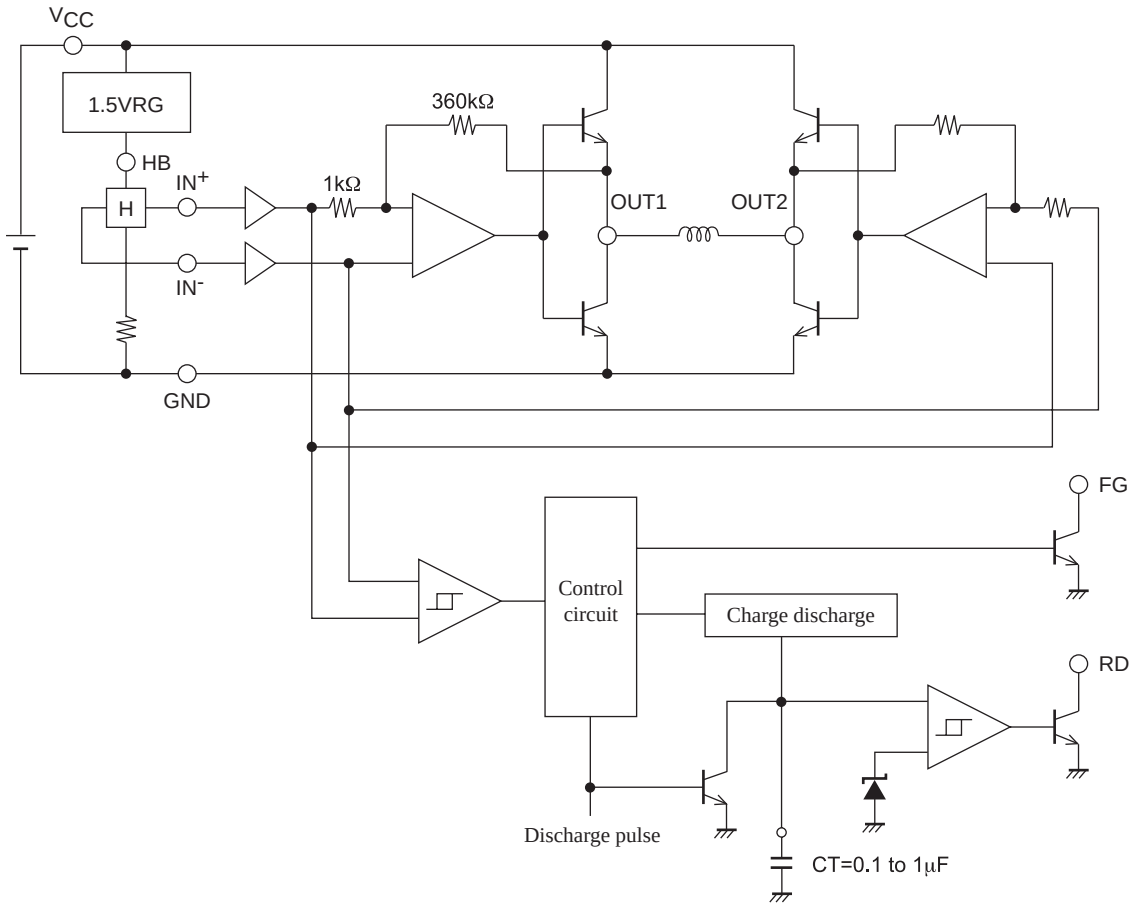
*2 To obtain Hall bias from V_{CC}, carry out $1/2 \times V_{CC}$ bias as shown in the figure. Linear driving is made through voltage control of the coil by amplifying the Hall output. When the Hall element output is large, the startup performance and efficiency are improved. Adjustment of the Hall element can reduce the noise further.

*3 To obtain Hall bias from the HB pin, carry out constant-voltage bias at about 1.5 V. which enables the Hall element to generate the stable Hall output satisfactory in temperature characteristics. The Hall output amplitude is adjusted with R1. (In the case of V_{CC} = 12 V, *2 proves advantageous in terms of heat generation in IC.)

*4 Keep this open when not used.

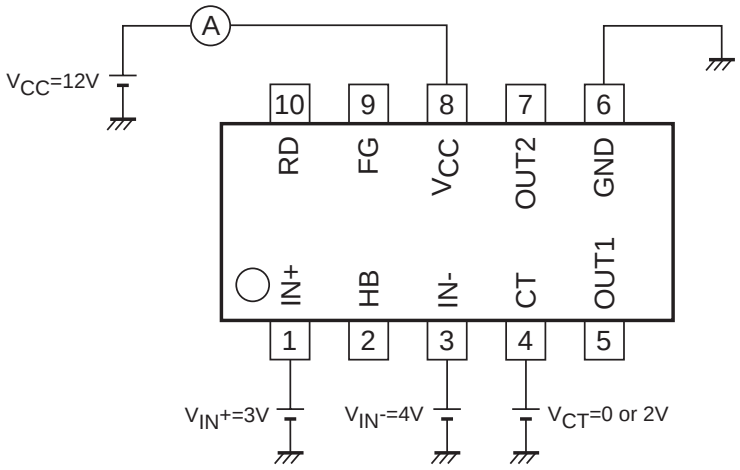
*5 When the wiring from the Hall output to IC Hall input is long, noise may be carried through the wiring. In this case, insert the capacitor as shown in the figure.

Internal Equivalent Circuit

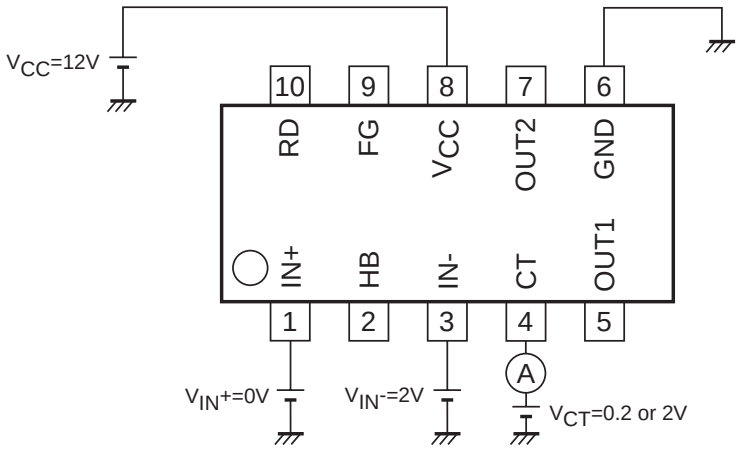


Test Circuit Diagram

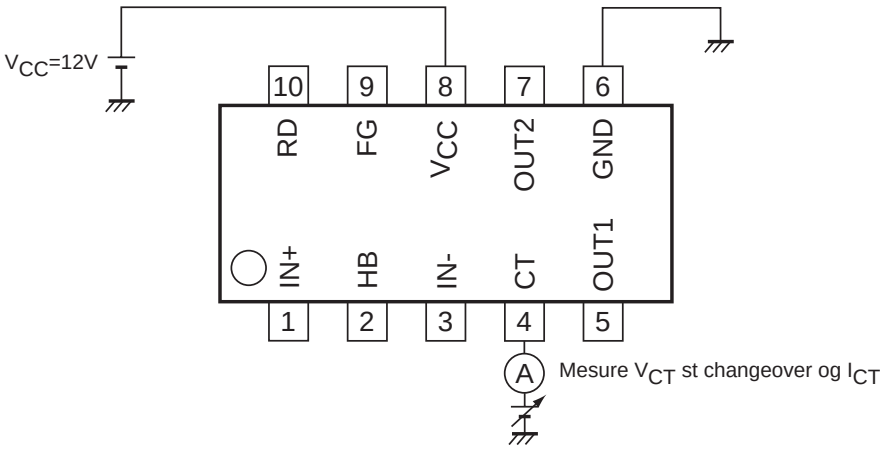
Input current (I_{CC})



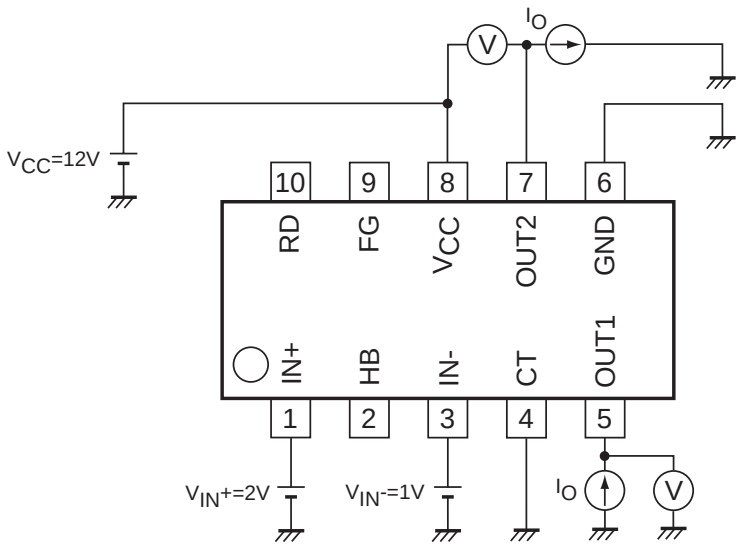
CT pin charge/discharge current (ICT)



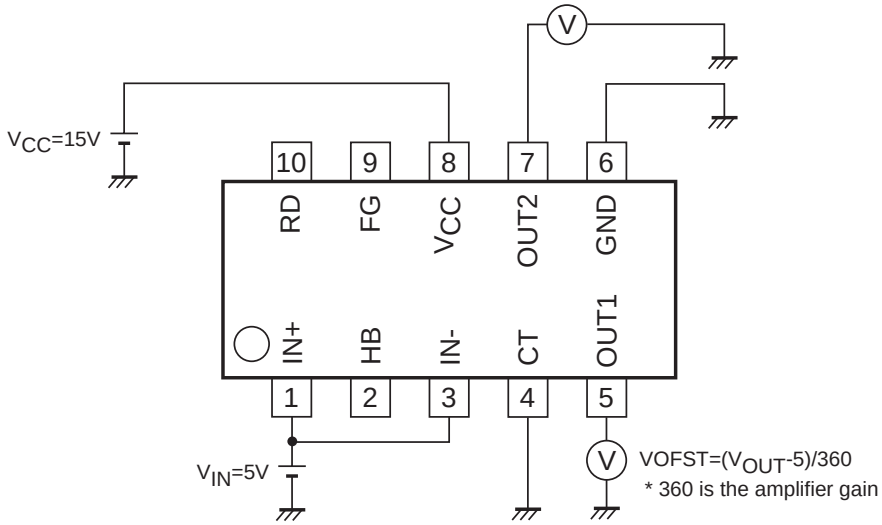
CT pin charge/discharge voltage (VCT)



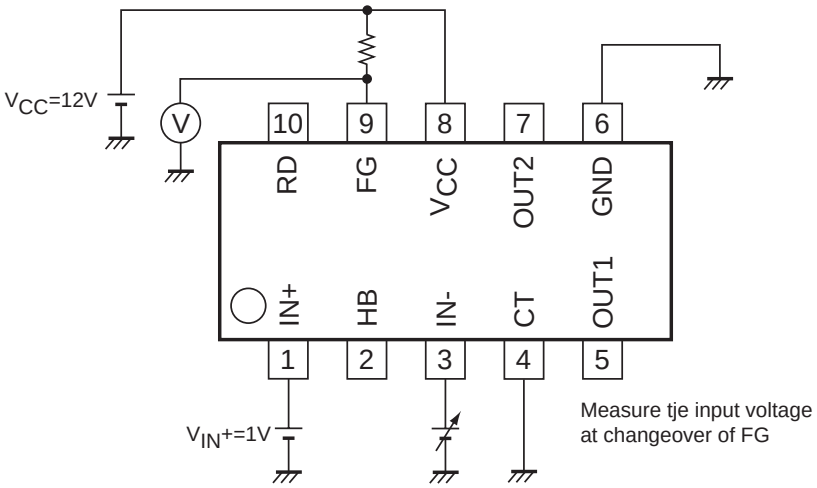
OUT output saturation voltage (V_{OL}, V_{OH})



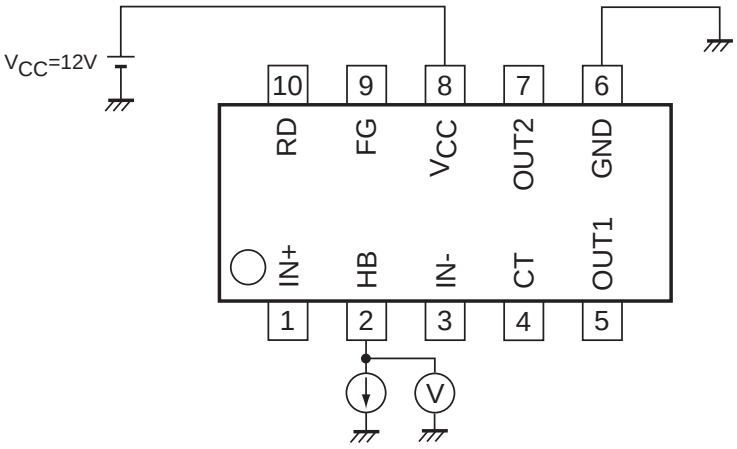
Input offset voltage (VOFST)



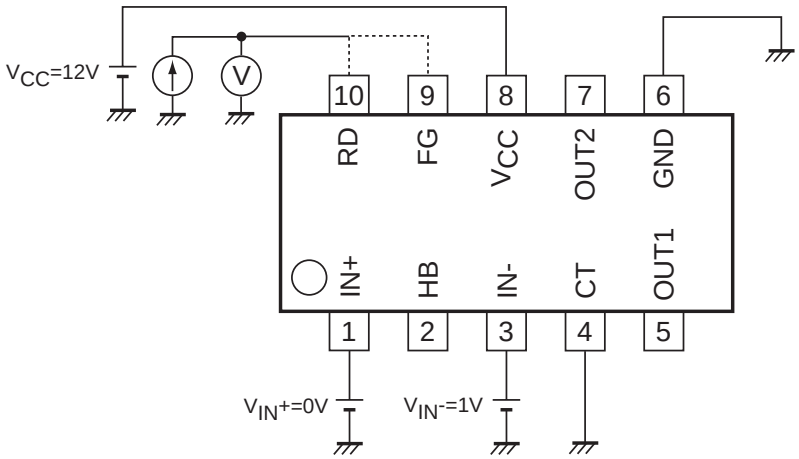
Hall input sensitivity (VHN)



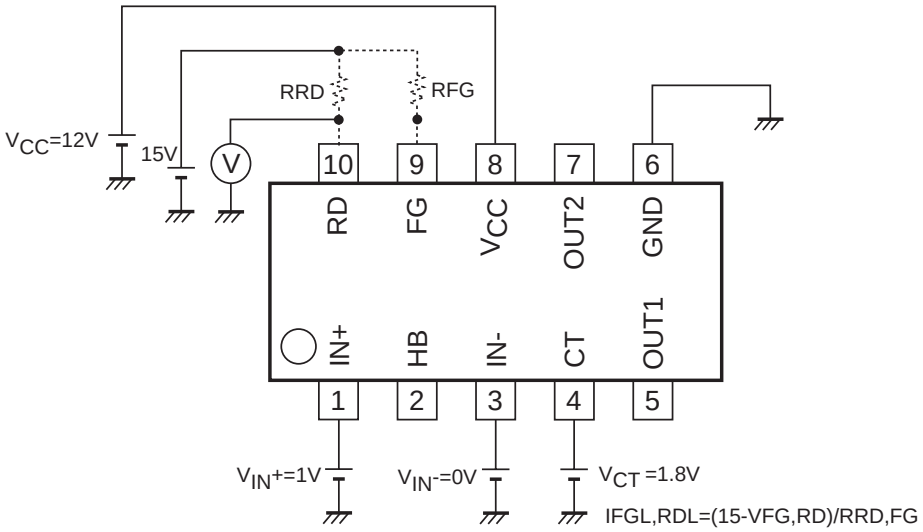
Hall bias output voltage (VHB)



FG, RD input pin L voltage (VFG, RD)



FG, RD input pin leakage current (IFGL, RDL)



Стандарт Электрон Связь

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