



1 Introduction

For proper driving motors, it might be needed....

2 motor constant measuring according ST



Procedure:

1. First, connect one of the motor phases to the oscilloscope channel.



Fig. 1. Measurement of the Motor Constant, Step 1

2. Set the oscilloscope trigger on the rising or falling edge of the channel and set the threshold value close to zero (a few mV above or below zero).
3. Turn the motor shaft quickly (this can be done by hand).

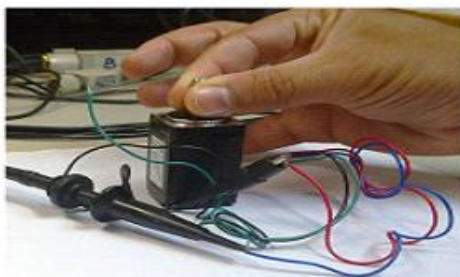


Fig. 2. Measurement of the Motor Constant, Step 2

4. Set the oscilloscope time and the voltage scale to display a sine wave during motor rotation.
5. Turn the motor until a good sine wave is generated. A good sine wave will maintain its amplitude contact for at least 2 or 3 cycles.

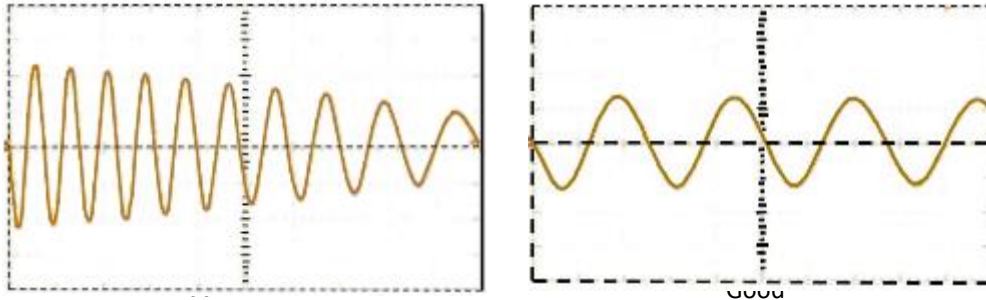


Abb. 6: Measurement of the Motor Constant, Bad and Good Sine Waves

6. This process may require several attempts.
7. Measure the peak voltage-to-frequency ratio of the good sine wave. The resulting value is the electric motor speed indicated in V/Hz.

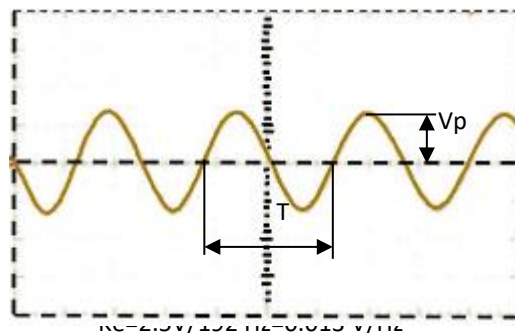


Fig. 3. Measurement of the Peak Voltage

$$\text{Motor constant} = V_p/T$$

3 motor constant measuring with accurate and broadband DVM

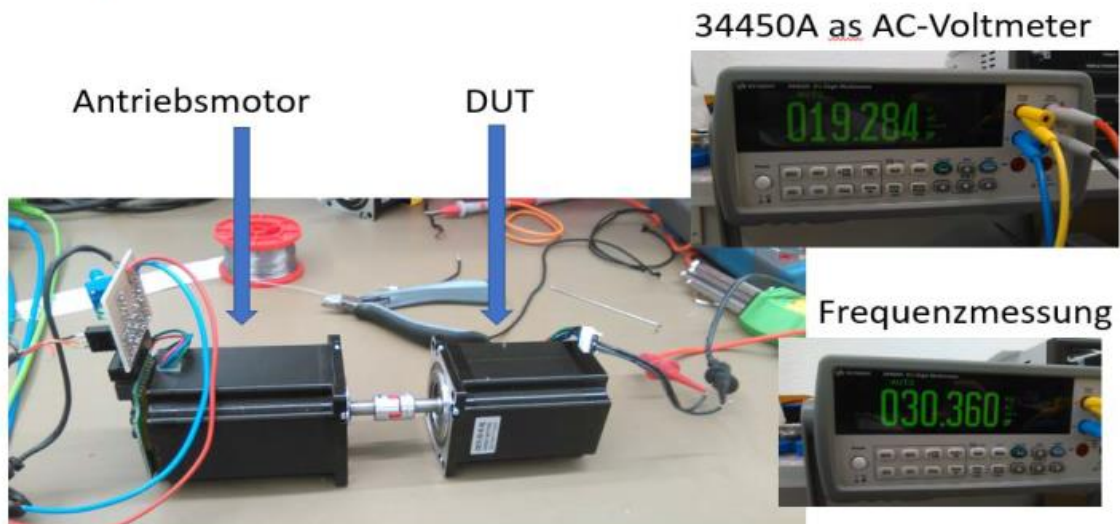
- DVM must have Frequency mode up to 20 kHz
- DVM must have voltage mode
- You need another motor w. fixed rpm as mechanical generator
- Connect DVM to One phase of DeviceUnderTest [DUT]

3.1 Example report

Beschreibung / Mittel

DUT -Motor	23Hxxxx-200		
KANN Motion	24.1		
Prüfer	M.Zimmermann	Datum	08.06.2017
Quelle	Manson HCS3304	Antrieb	24H286
Messgerät	Keysight 34450A		

Messaufbau



für die Ermittlung der Motorenkonstante wird eine regelmässige Drehbewegung an den Prüfling angelegt, am Prüfling wird dann via hochwertigem DVM die AC-effektivspannung und die Frequenz an einer Phase ermittelt

Messergebnis

Phasenspannung	19.28 Veff	27.265776 Vp
Frequenz der Spannung	287 Hz	
Motorenkonstante für Tool	0.0950 V/Hz	