

# STK404-070NGEVB, STK404-120NGEVB, STK404-140NGEVB



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## STK404-000N Series Evaluation Board User's Manual

### EVAL BOARD USER'S MANUAL

Thick-Film Hybrid IC for use used in from 60 W to 180 W × 1ch class AB audio power amplifiers.

This Evaluation Board User's Manual describes the set-up and use of the STK404-000N Series Evaluation Board for SANYO Semiconductor (An ON Semiconductor Company).

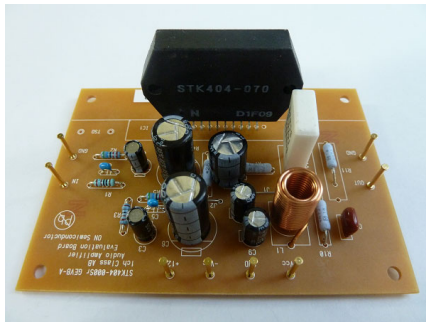
Thick-Film Hybrid IC for use in from 60 W to 180 W × 1ch class AB audio power amplifiers devices STK404-070N-E, STK404-120N-E and STK404-140N-E.

For data sheets and additional on these devices, please visit the ON Semiconductor website at [www.onsemi.com](http://www.onsemi.com).



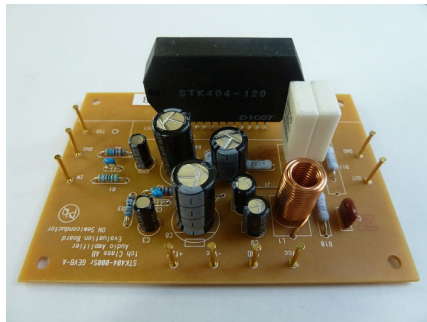
Figure 1. STK404-000N Series Evaluation Board

### EVALUATION BOARD FOR STK404-070N, -120N, -140N



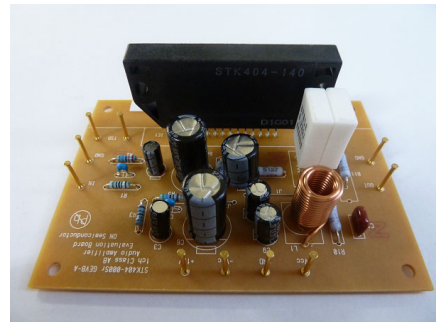
(100 mm × 70 mm × 1.6 mm,  
Phenol 1-layer Board)

Figure 2. STK404-070NGEVB



(100 mm × 70 mm × 1.6 mm,  
Phenol 1-layer Board)

Figure 3. STK404-120NGEVB



(100 mm × 70 mm × 1.6 mm,  
Phenol 1-layer Board)

Figure 4. STK404-140NGEVB

Table 1. SELECTION GUIDE

	STK404-070N-E	STK404-120N-E	STK404-140N-E
Output1 (10%/1 kHz)	60 W × 1ch	120 W × 1ch	180 W × 1ch
Output2 (1%/20 Hz to 20 kHz)	40 W × 1ch	80 W × 1ch	120 W × 1ch
Maximum Rating $V_{CC}$ max (no sig.)	±46 V	±65 V	±78 V
Maximum Rating $V_{CC}$ (6 Ω)	±39 V	±59 V	±73 V
Recommended Operating $V_{CC}$ (6 Ω)	±30 V	±41 V	±51 V
Package Size	44.0 × 25.6 × 8.5 (mm)	46.6 × 25.5 × 8.5 (mm)	59.2 × 25.5 × 8.5 (mm)

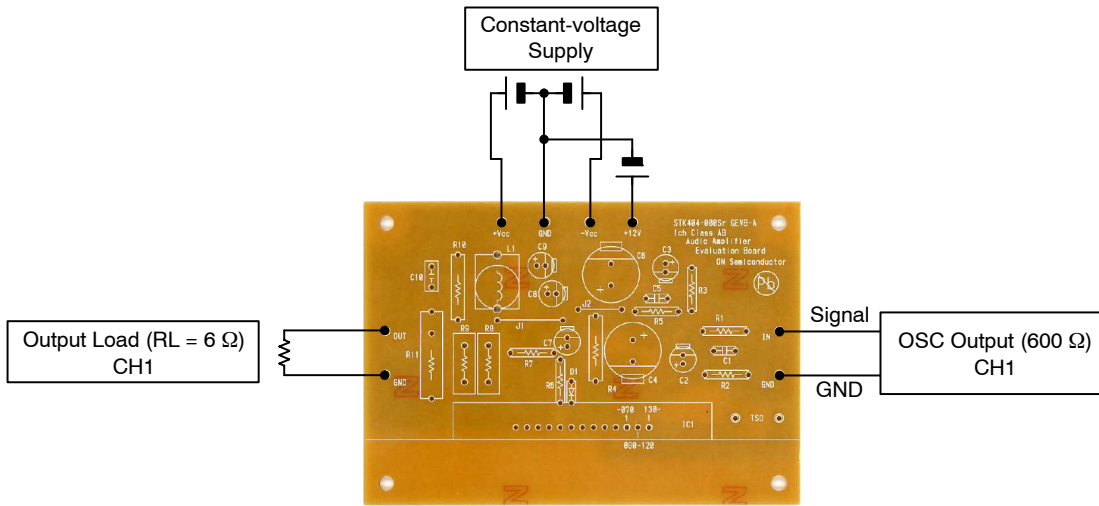


Figure 5. Characteristics Confirmation

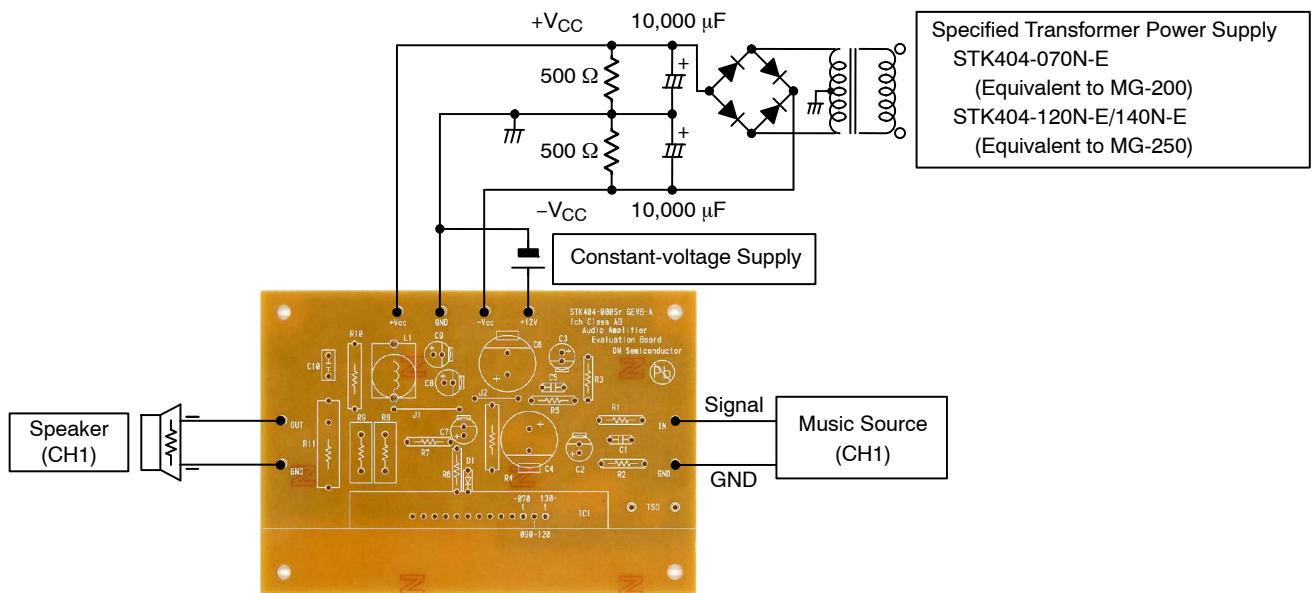


Figure 6. Sound Quality Configuration, Load Short-circuit Test, Noise Examination

# STK404-070NGEVB, STK404-120NGEVB, STK404-140NGEVB

## STK404-000NSR PCB PARTS LIST

Table 2. PCB NAME: STK404-000SR GEVB - A

Type (IC1)	STK404-070N-E	STK404-120N-E	STK404-140N-E
Position of (1)pin	Third from the Right End	Second from the Right End	The Right End
Location			
R1	1 k $\Omega$	←	←
R2	56 k $\Omega$	←	←
R3	1.8 k $\Omega$	←	←
R4	100 $\Omega$ /1 W	←	←
R5	56 k $\Omega$	←	←
R6	10 k $\Omega$ /1 W	4.7 k $\Omega$ /1 W	5.1 k $\Omega$ /1 W
R7	10 k $\Omega$ /1 W	4.7 k $\Omega$ /1 W	5.1 k $\Omega$ /1 W
R8	0.22 $\Omega$ /5 W	←	←
R9	-	0.22 $\Omega$ /5 W	←
R10	4.7 $\Omega$ /1 W	←	←
R11	4.7 $\Omega$ /1 W	←	←
C1	470 pF	←	←
C2	2.2 $\mu$ F/50 V	←	←
C3	10 $\mu$ F/50 V	←	←
C4	100 $\mu$ F/100 V	←	←
C5	5 pF	←	←
C6	100 $\mu$ F/50 V	←	←
C7	47 $\mu$ F/100 V	←	←
C8	10 $\mu$ F/100 V	←	←
C9	10 $\mu$ F/100 V	←	←
C10	0.1 $\mu$ F	←	←
D1	200 V/0.5 A	Short	Short
L1	2.2 $\mu$ H	←	←
J1	15 mm	←	←
J2	10 mm	←	←

TEST CIRCUITS

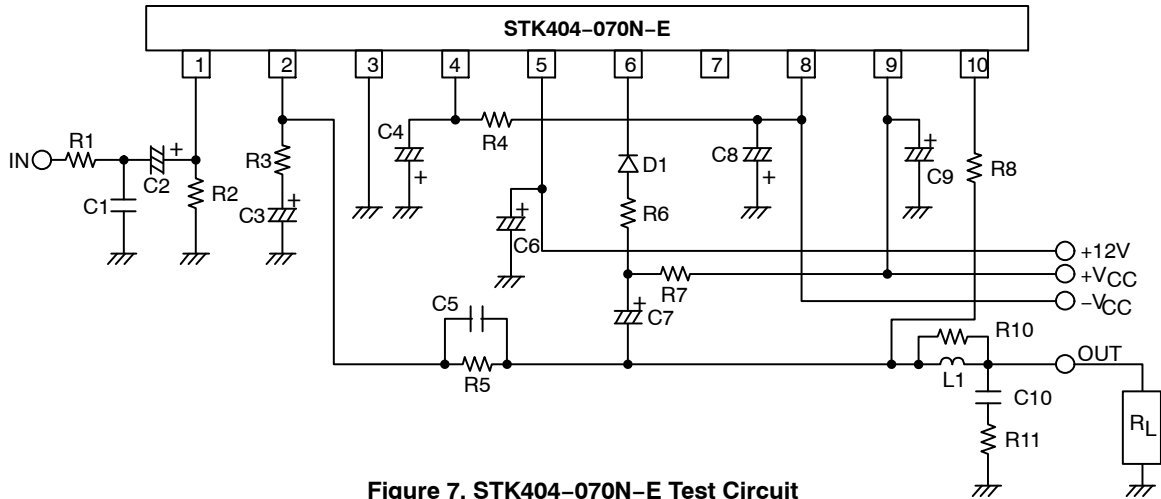


Figure 7. STK404-070N-E Test Circuit

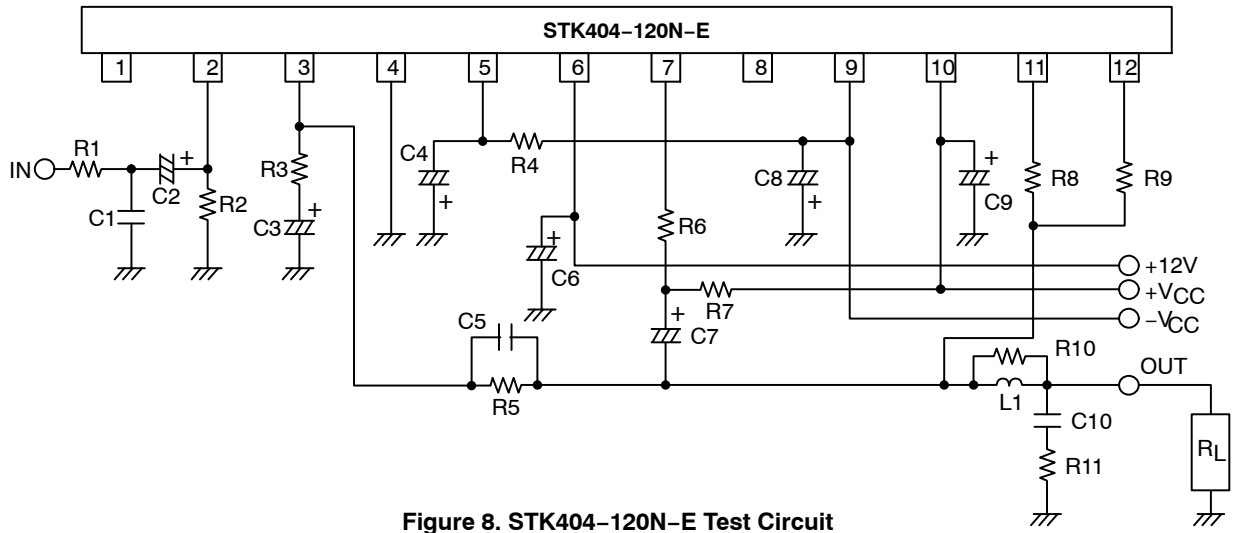


Figure 8. STK404-120N-E Test Circuit

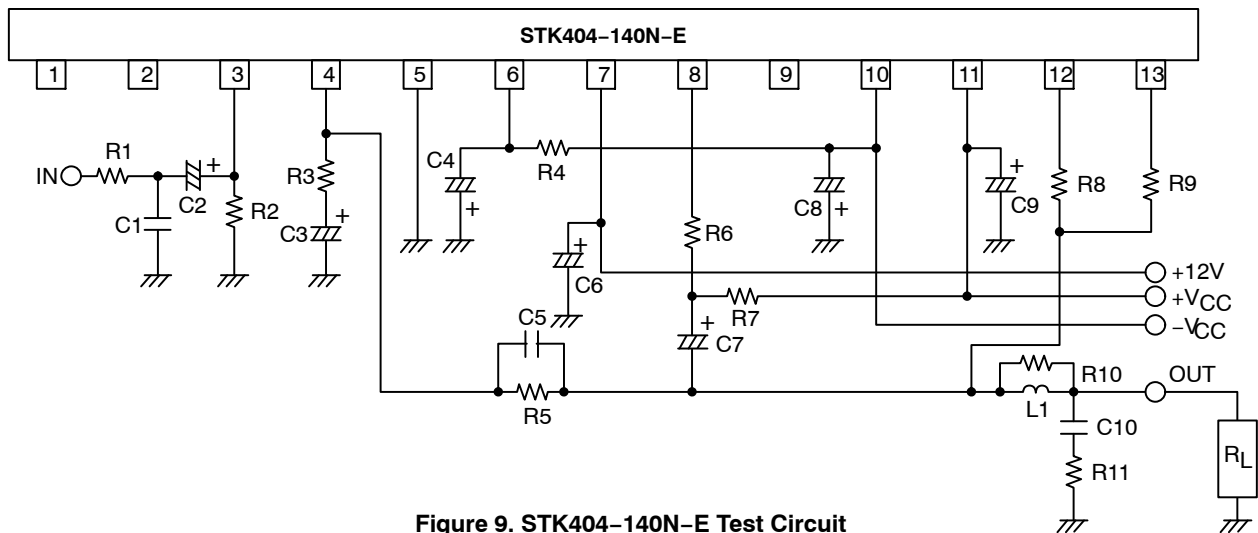


Figure 9. STK404-140N-E Test Circuit

# STK404-070NGEVB, STK404-120NGEVB, STK404-140NGEVB

## SUBSTRATE SPECIFICATIONS

(Substrate Recommended for Operation of STK404-070N/120N/140N)

Size: 100 mm × 70 mm × 1.6 mm, Phenol 1-layer Board  
Material: Phenol  
Copper Side (35 μ)

## PCB LAYOUT EXAMPLE

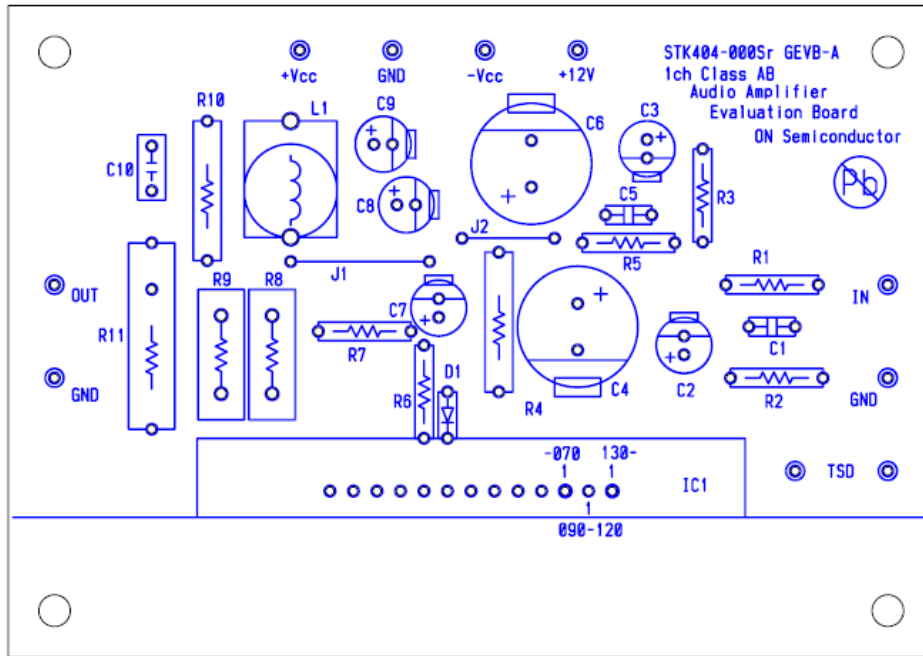


Figure 10. Top View

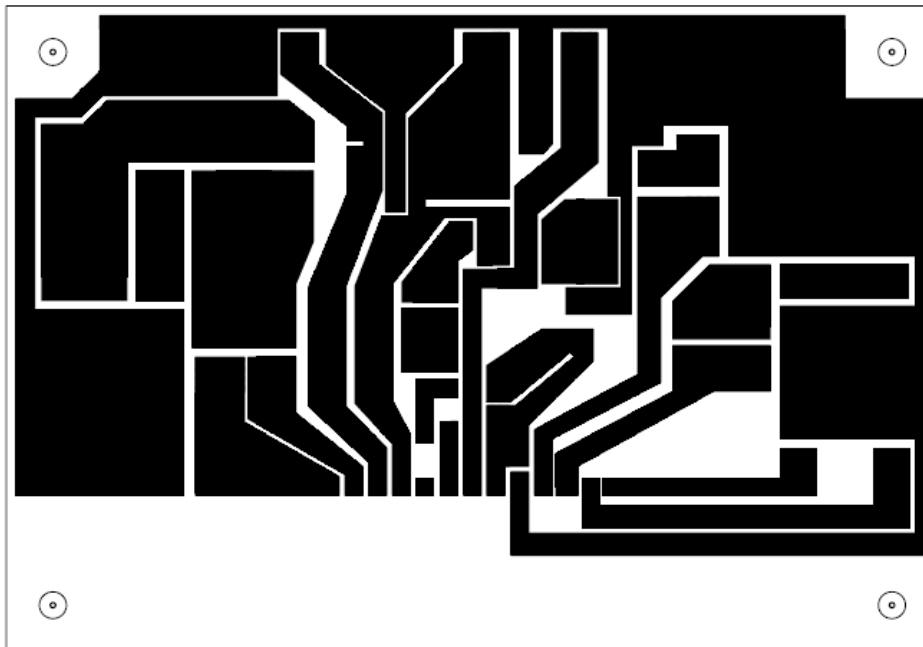


Figure 11. Top View

CHARACTERISTIC OF EVALUATION BOARD – STK404-070N-E

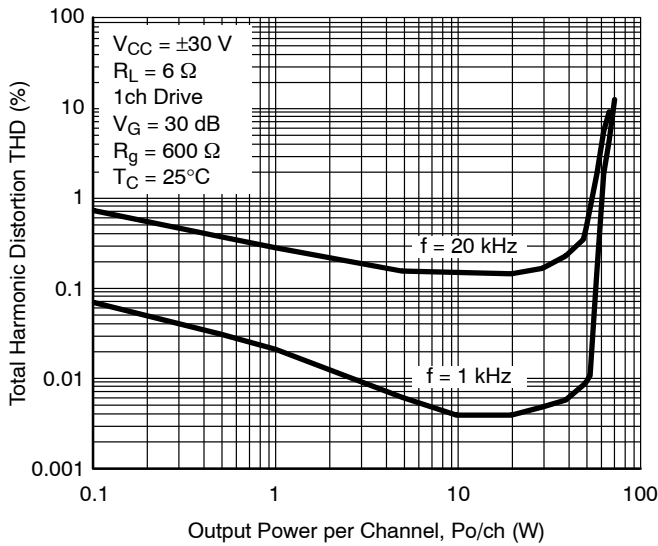


Figure 12. THD vs.  $P_o$

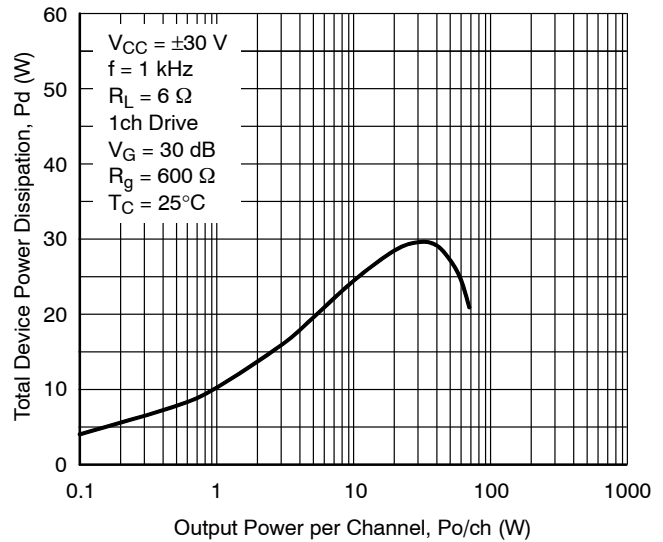


Figure 13.  $P_d$  vs.  $P_o$

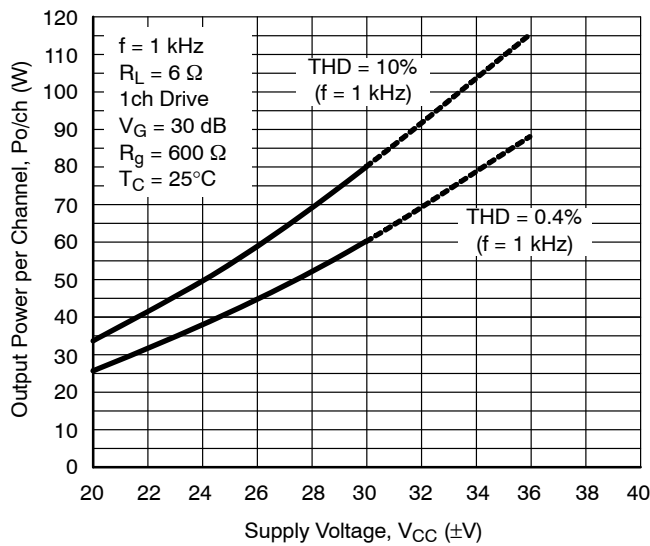


Figure 14.  $P_o$  vs.  $V_{CC}$

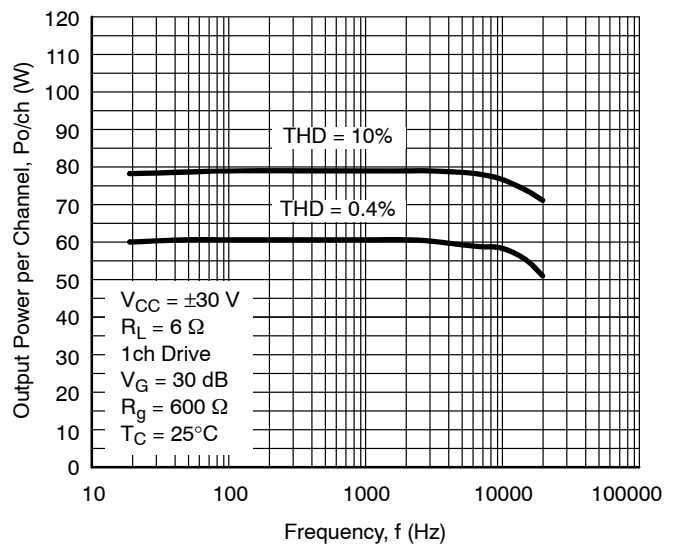


Figure 15.  $P_o$  vs.  $f$

CHARACTERISTIC OF EVALUATION BOARD - STK404-120N-E

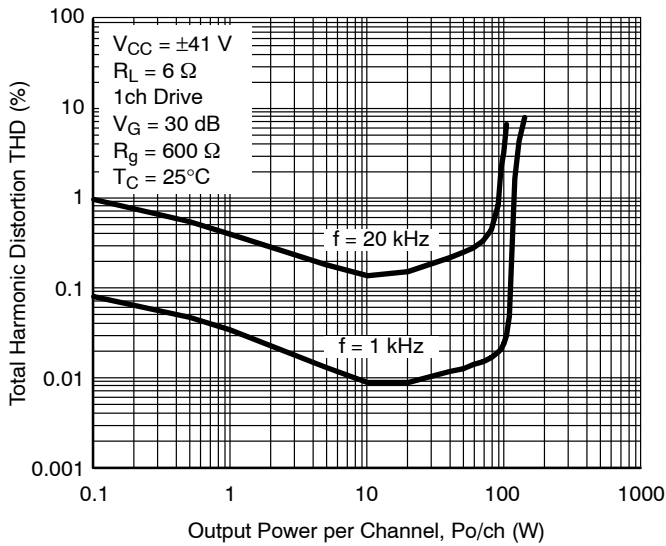


Figure 16. THD vs. Po

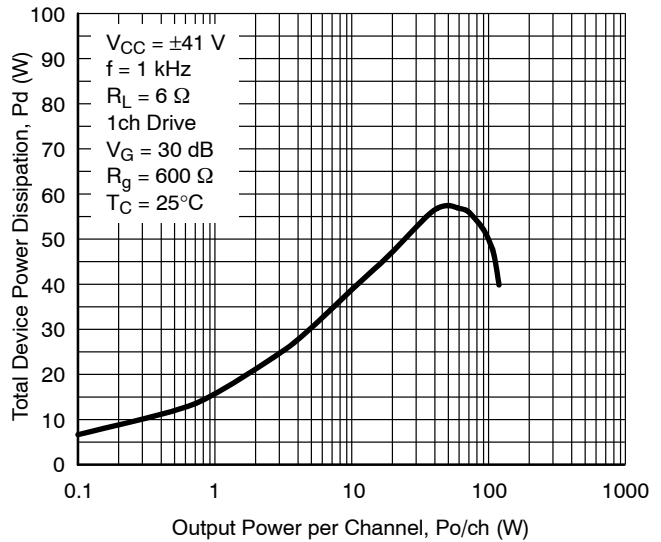


Figure 17. Pd vs. Po

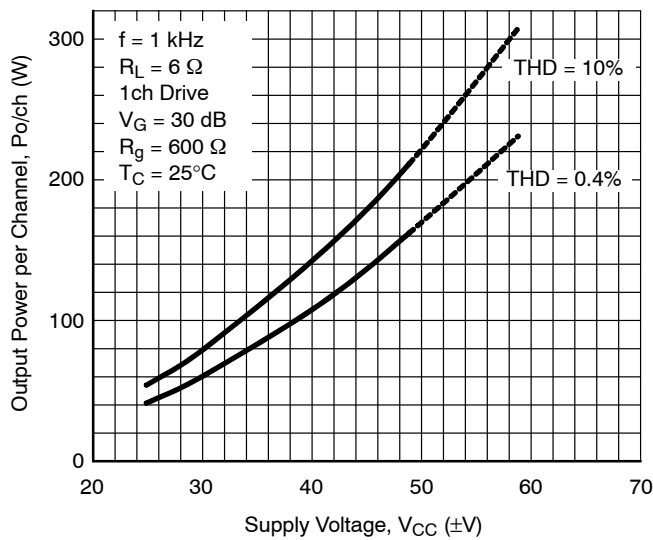


Figure 18. Po vs. VCC

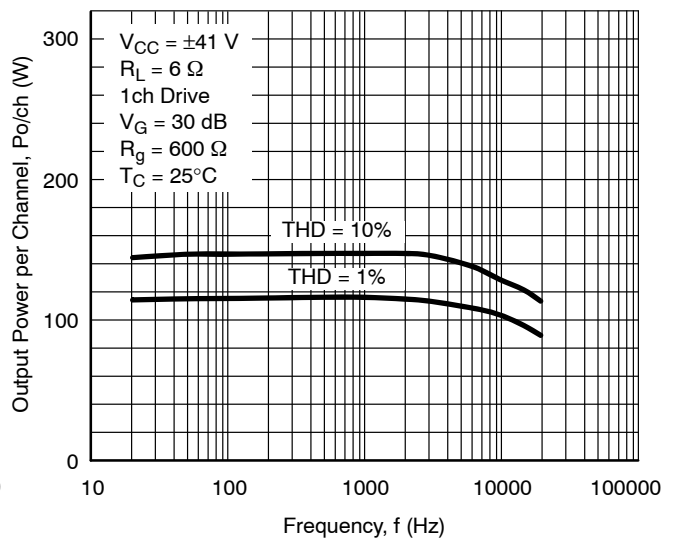


Figure 19. Po vs. f

CHARACTERISTIC OF EVALUATION BOARD - STK404-140N-E

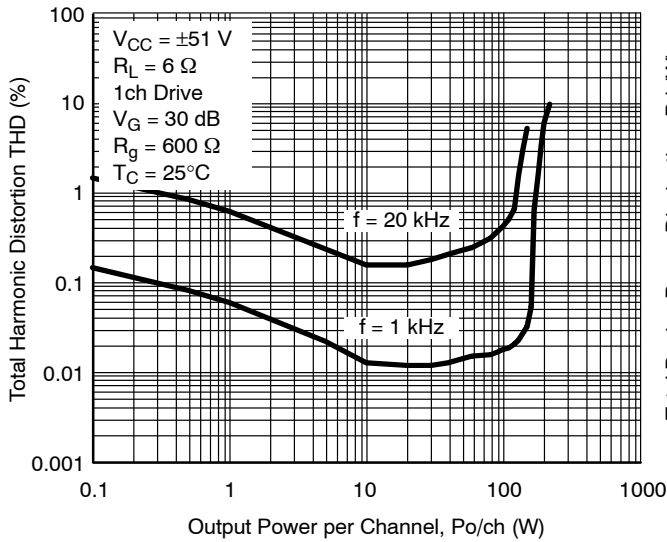


Figure 20. THD vs.  $P_o$

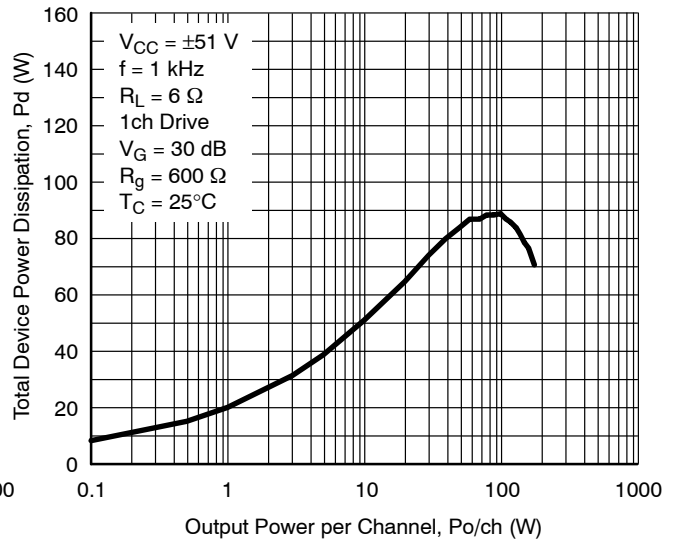


Figure 21.  $P_d$  vs.  $P_o$

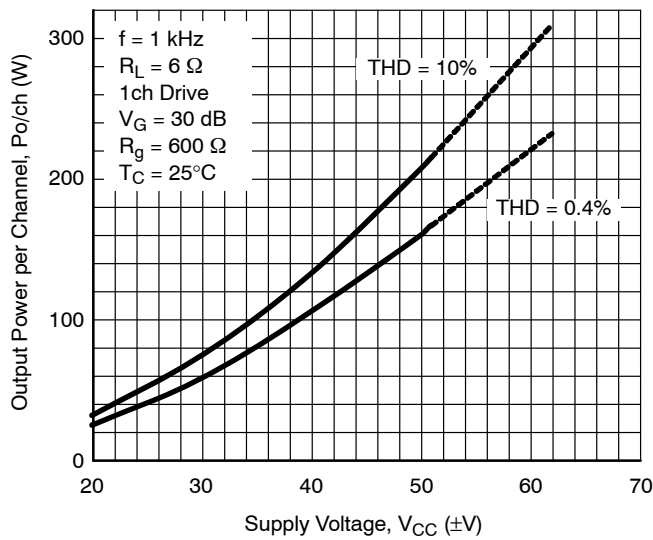


Figure 22.  $P_o$  vs.  $V_{CC}$

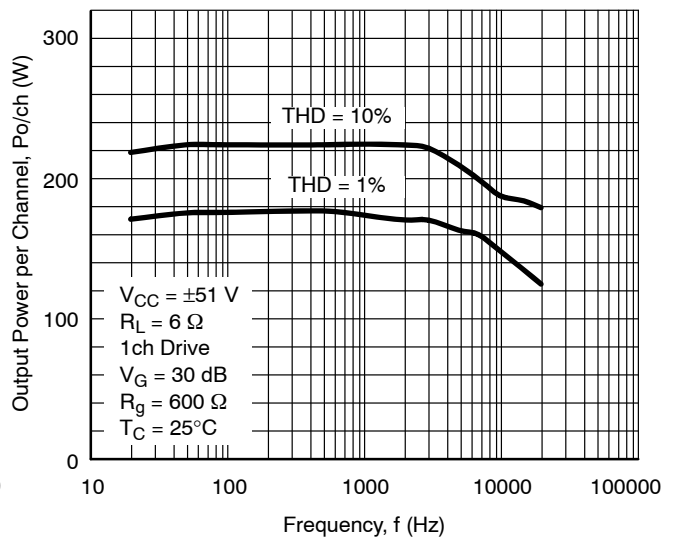


Figure 23.  $P_o$  vs.  $f$



# STK404-070NGEVB, STK404-120NGEVB, STK404-140NGEVB

## STAND-BY CONTROL & MUTE CONTROL APPLICATION

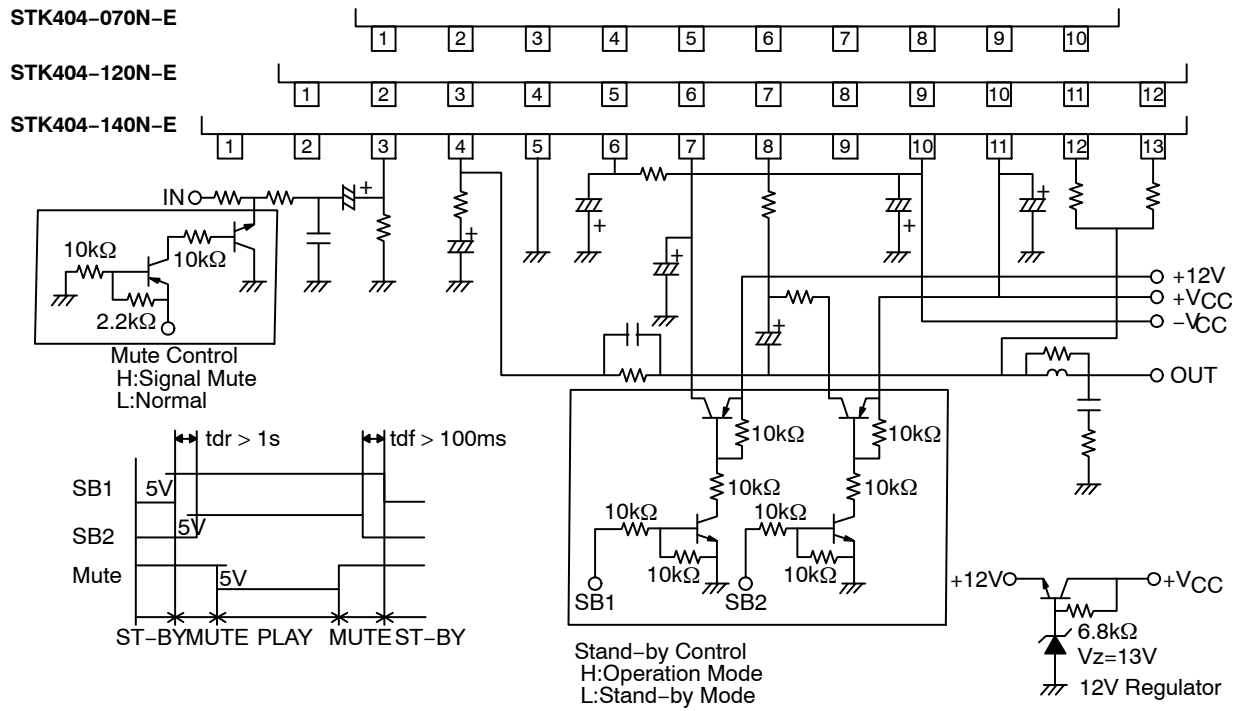


Figure 24. STK404-000-Ese Stand-by Control & Mute Control Application

## THERMAL SHUT DOWN APPLICATION

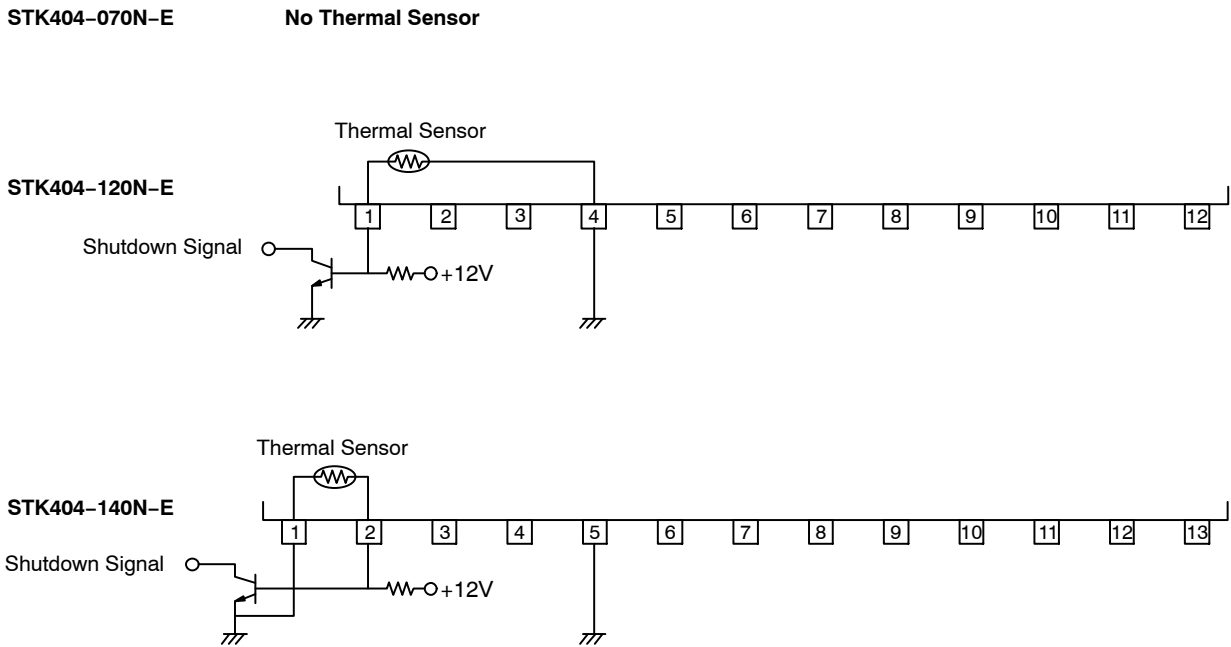


Figure 25. STK404-000-Esr Thermal Shut Down Application

THERMAL SENSOR CHARACTERISTIC

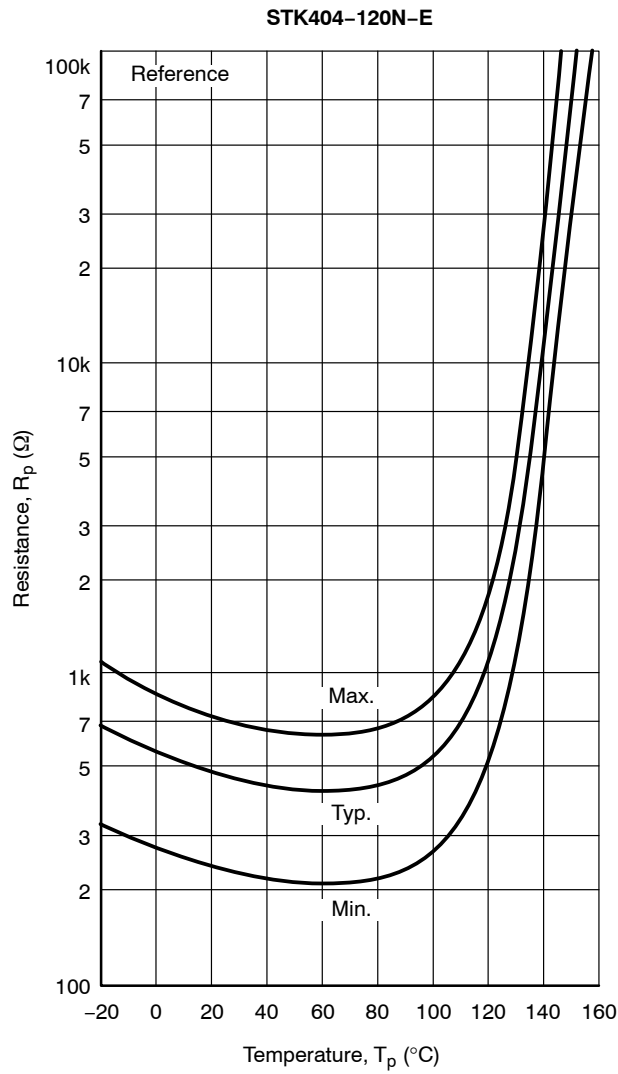


Figure 26.  $R_p$  vs.  $T_p$

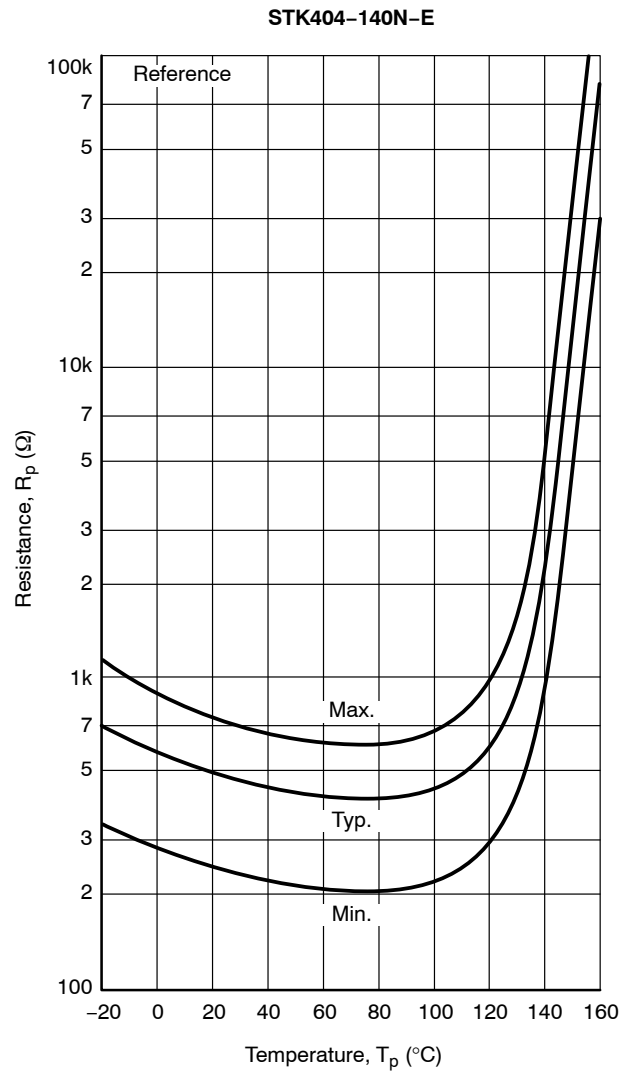


Figure 27.  $R_p$  vs.  $T_p$

# STK404-070NGEVB, STK404-120NGEVB, STK404-140NGEVB

## ROAD-SHORT & DC VOLTAGE PROTECTION APPLICATION

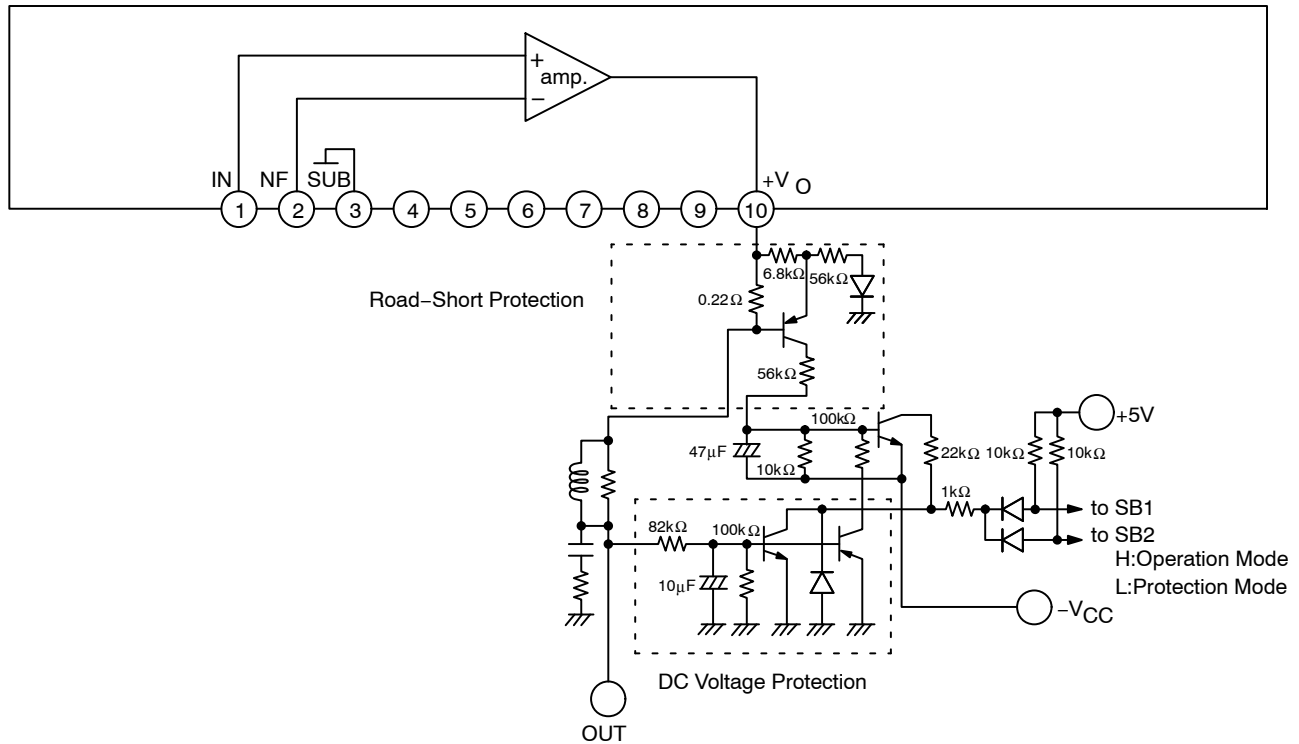


Figure 28. STK404-070N-E Road-short & DC Voltage Protection Application

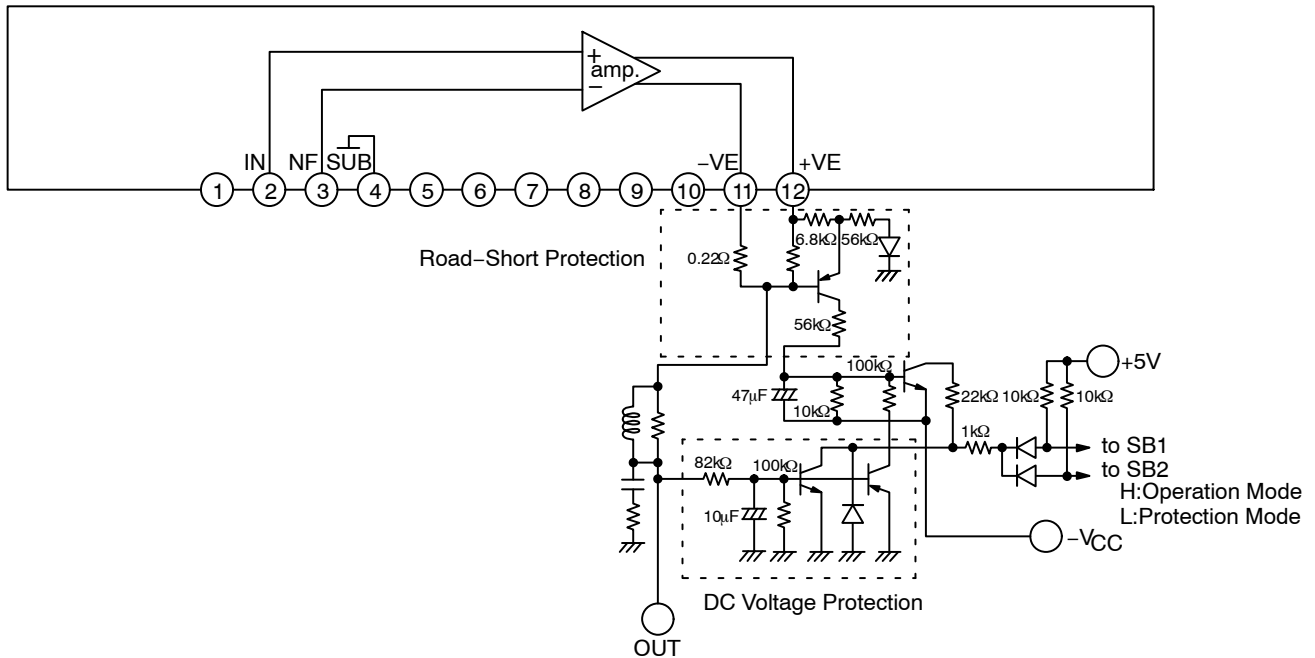


Figure 29. STK404-120N-E Road-short & DC Voltage Protection Application

STK404-070NGEVB, STK404-120NGEVB, STK404-140NGEVB

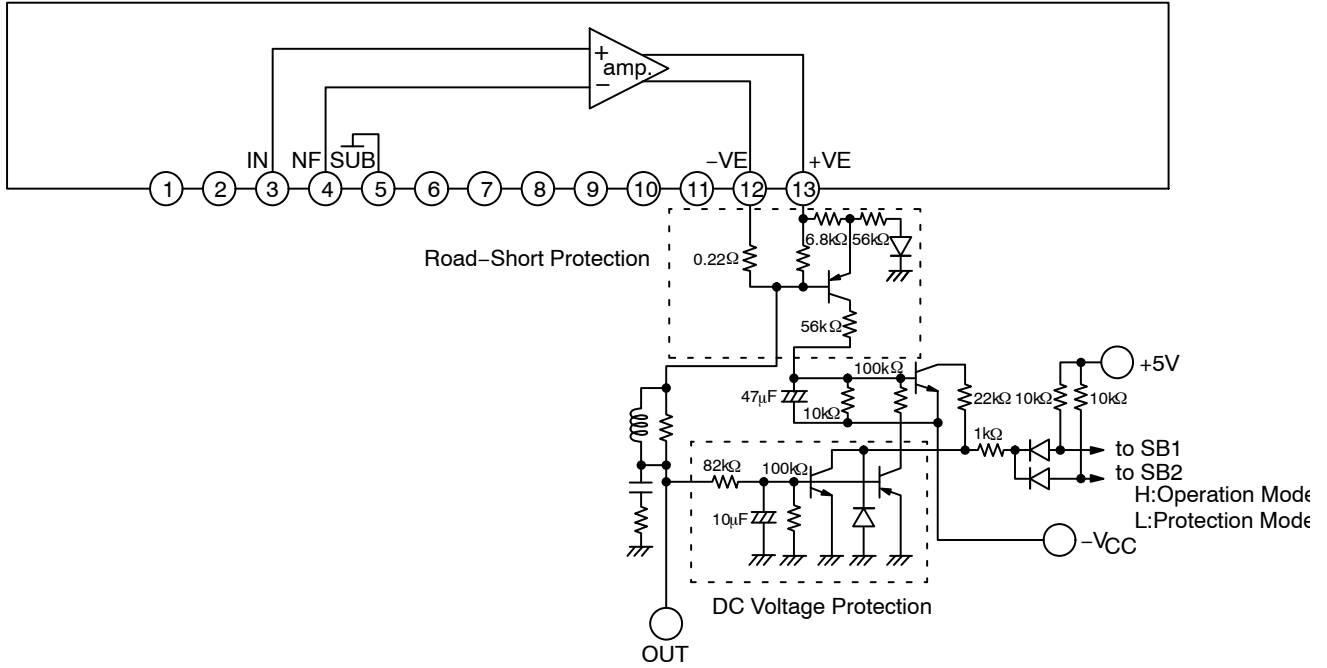


Figure 30. STK404-140N-E Road-short & DC Voltage Protection Application

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