

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



ON Semiconductor®

<http://onsemi.com>

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.

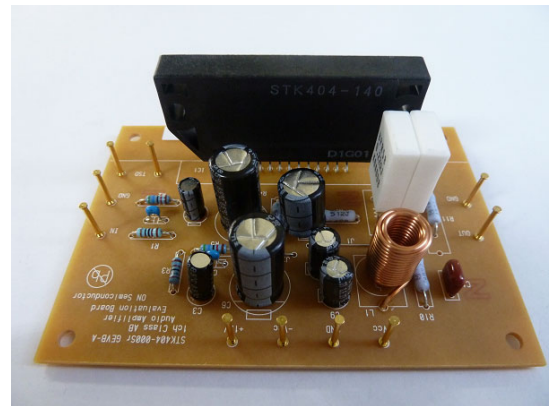
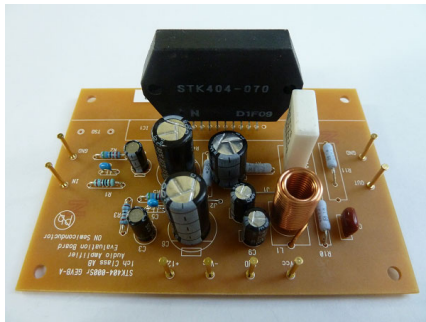


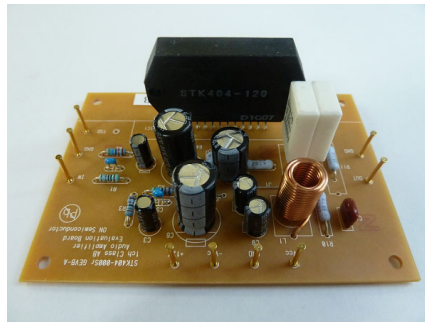
Figure 1. STK404-000N Series Evaluation Board

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



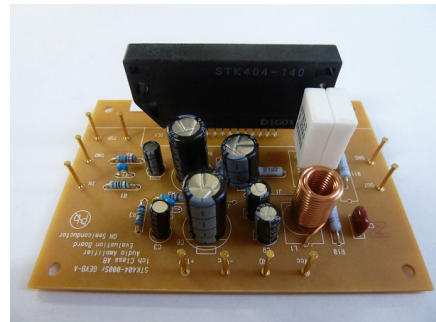
(100 mm × 70 mm × 1.6 mm,
Phenol 1-layer Board)

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)

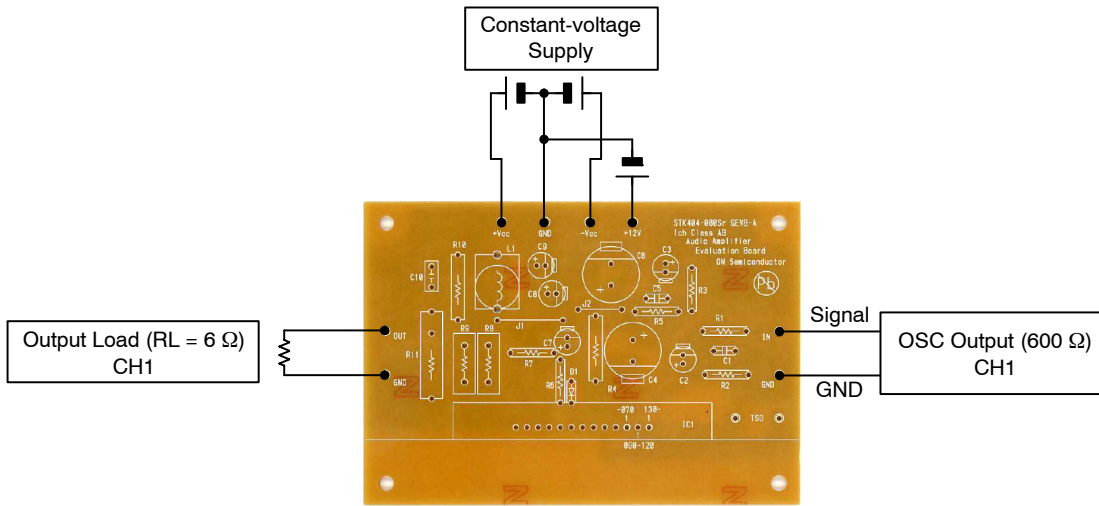


Figure 5. Characteristics Confirmation

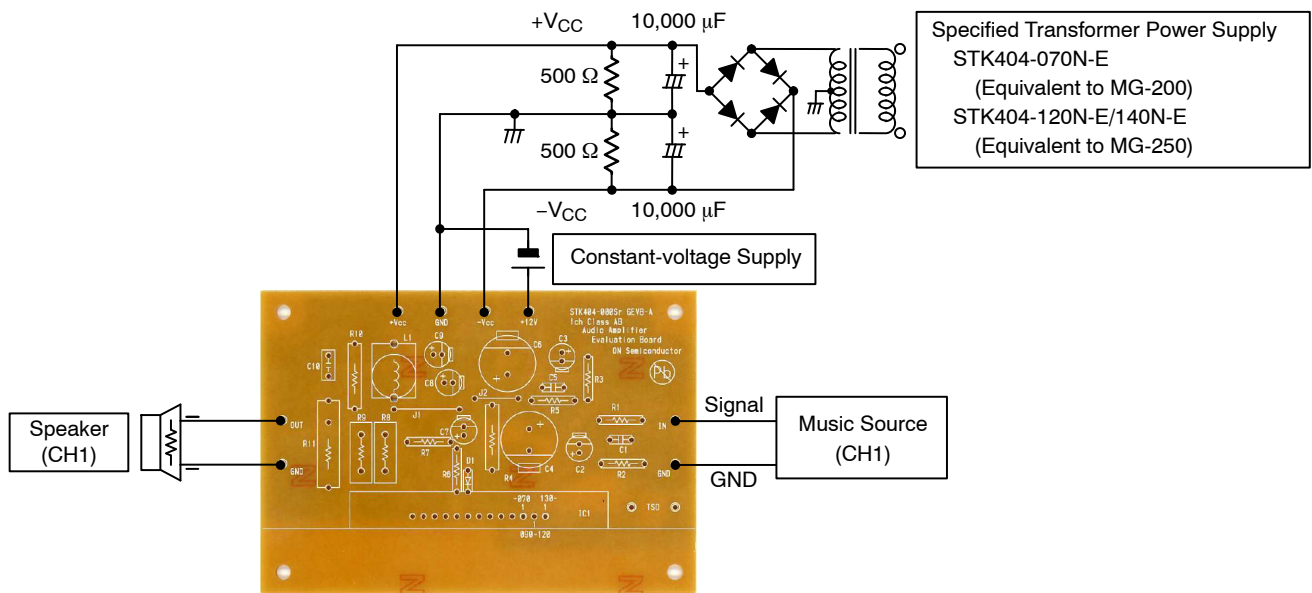


Figure 6. Sound Quality Configuration, Load Short-circuit Test, Noise Examination

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 Ω	←	←
R2	56 k Ω	←	←
R3	1.8 k Ω	←	←
R4	100 Ω /1 W	←	←
R5	56 k Ω	←	←
R6	10 k Ω /1 W	4.7 k Ω /1 W	5.1 k Ω /1 W
R7	10 k Ω /1 W	4.7 k Ω /1 W	5.1 k Ω /1 W
R8	0.22 Ω /5 W	←	←
R9	-	0.22 Ω /5 W	←
R10	4.7 Ω /1 W	←	←
R11	4.7 Ω /1 W	←	←
C1	470 pF	←	←
C2	2.2 μ F/50 V	←	←
C3	10 μ F/50 V	←	←
C4	100 μ F/100 V	←	←
C5	5 pF	←	←
C6	100 μ F/50 V	←	←
C7	47 μ F/100 V	←	←
C8	10 μ F/100 V	←	←
C9	10 μ F/100 V	←	←
C10	0.1 μ F	←	←
D1	200 V/0.5 A	Short	Short
L1	2.2 μ H	←	←
J1	15 mm	←	←
J2	10 mm	←	←

TEST CIRCUITS

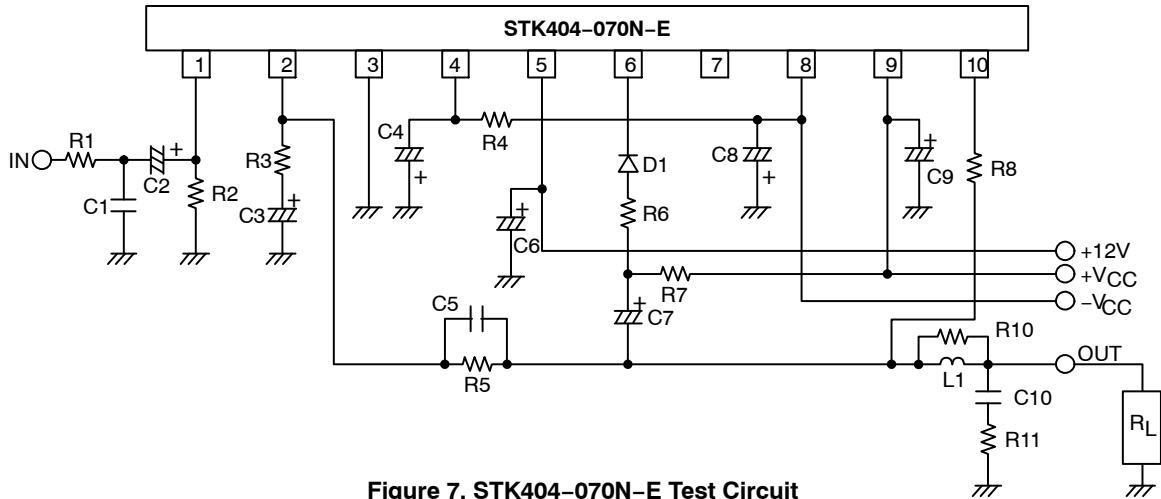


Figure 7. STK404-070N-E Test Circuit

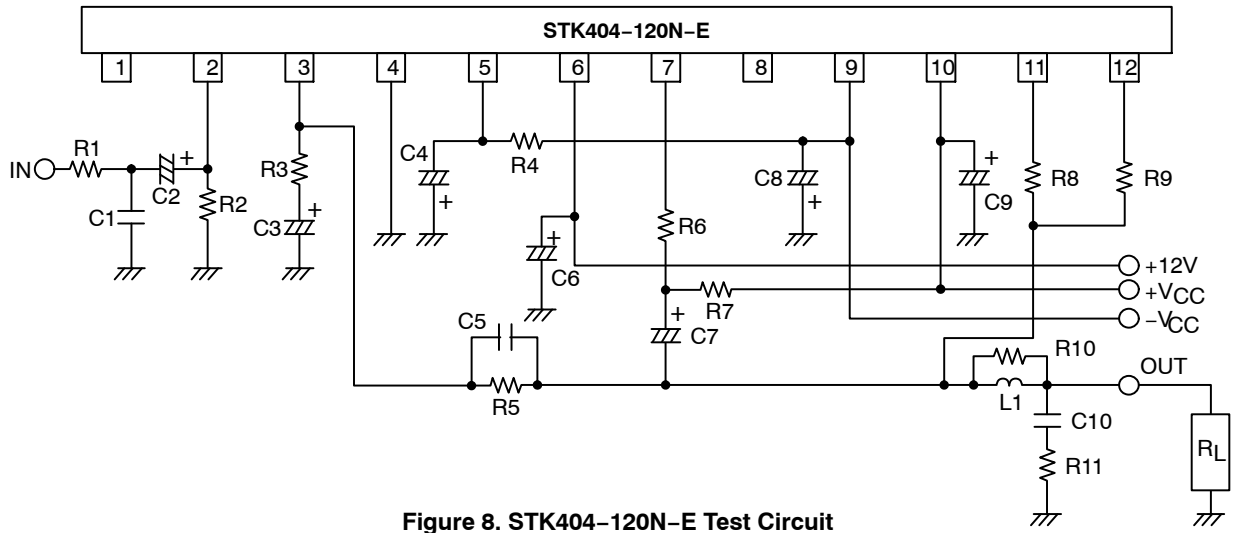


Figure 8. STK404-120N-E Test Circuit

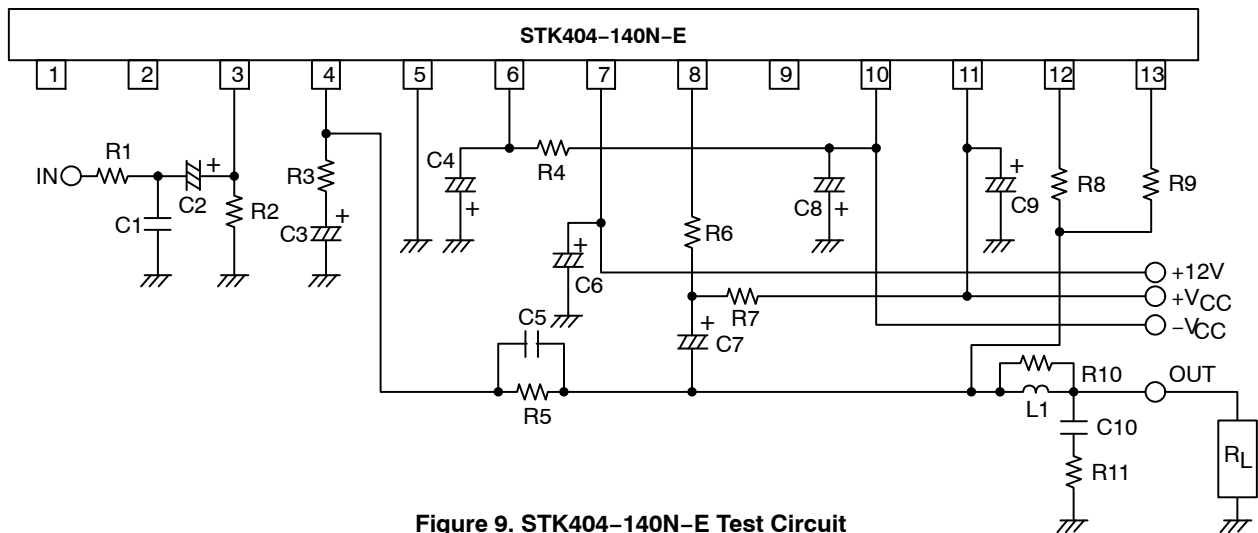


Figure 9. STK404-140N-E Test Circuit

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

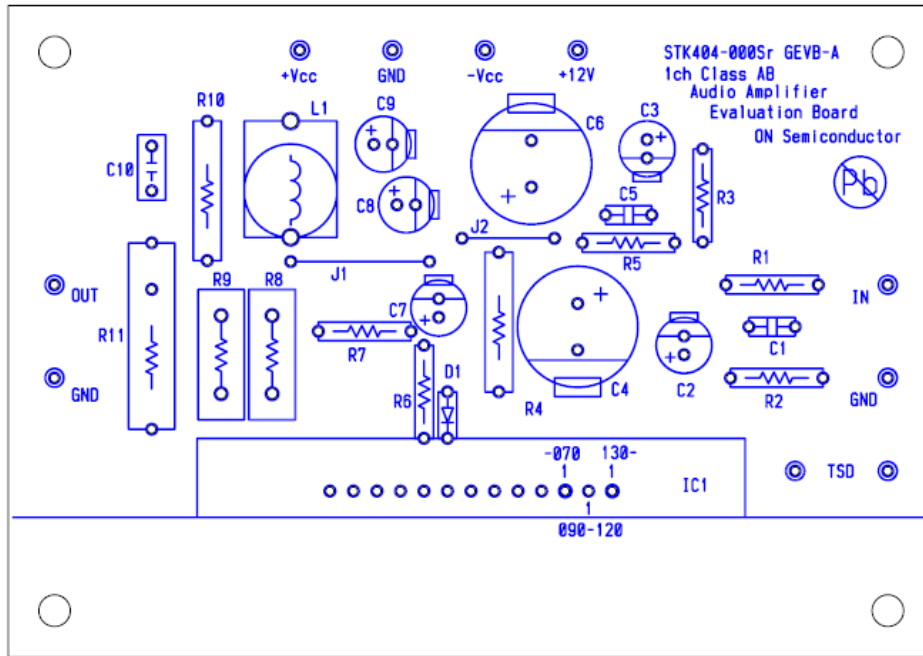


Figure 10. Top View

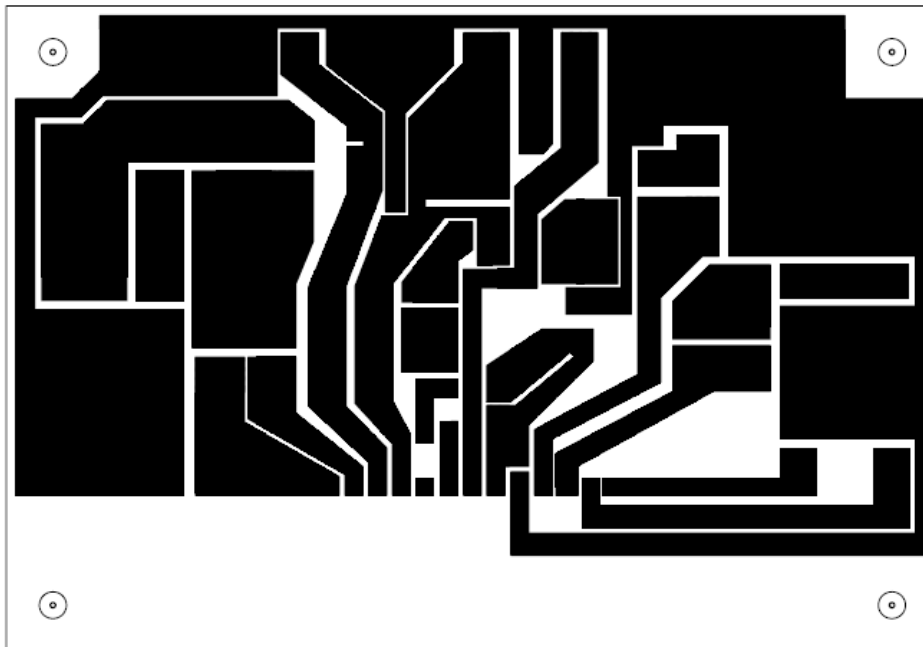


Figure 11. Top View

CHARACTERISTIC OF EVALUATION BOARD - STK404-070N-E

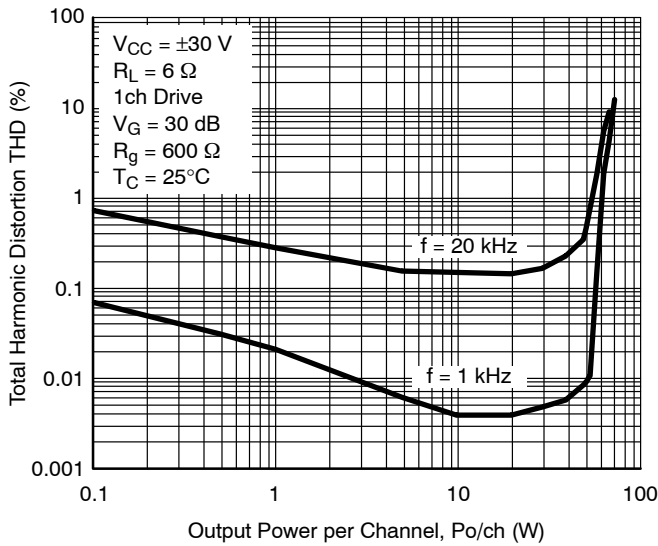


Figure 12. THD vs. Po

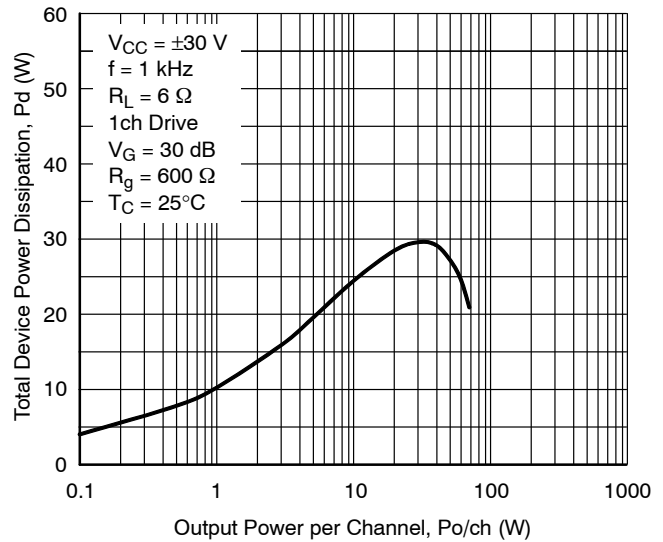


Figure 13. Pd vs. Po

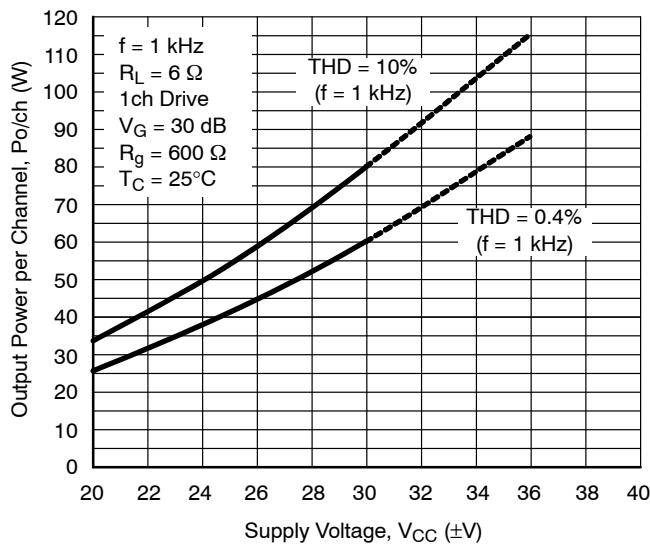


Figure 14. Po vs. VCC

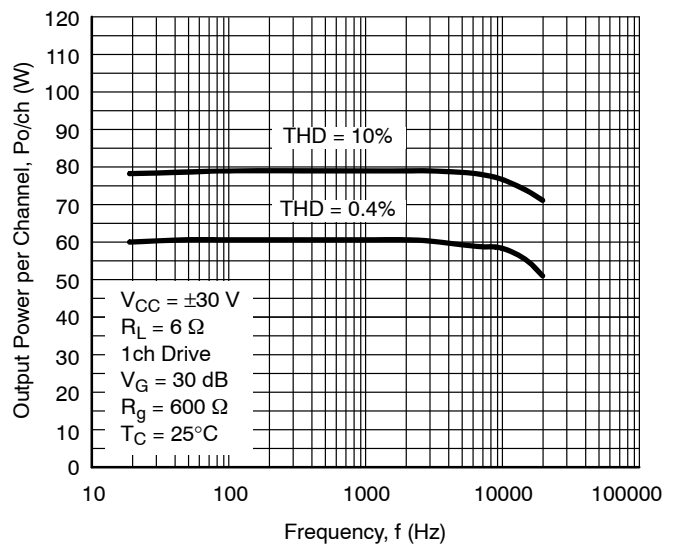


Figure 15. Po vs. f

CHARACTERISTIC OF EVALUATION BOARD – STK404-120N-E

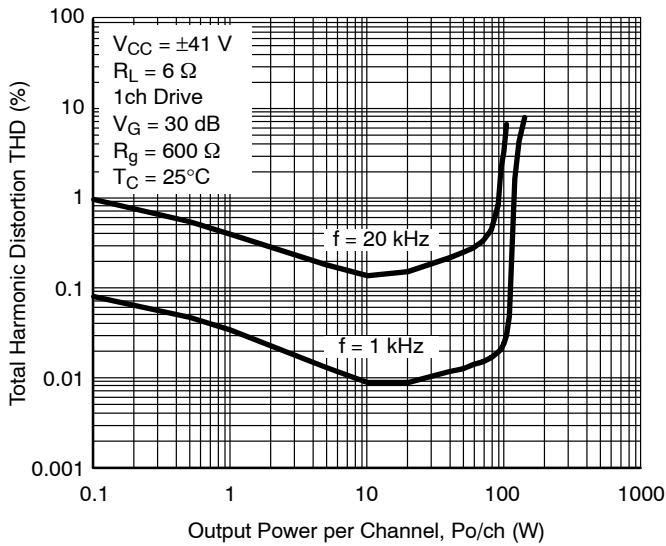


Figure 16. THD vs. Po

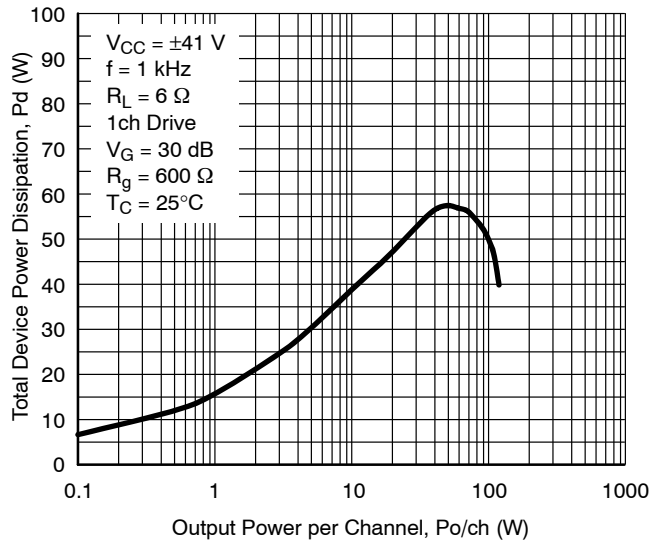


Figure 17. Pd vs. Po

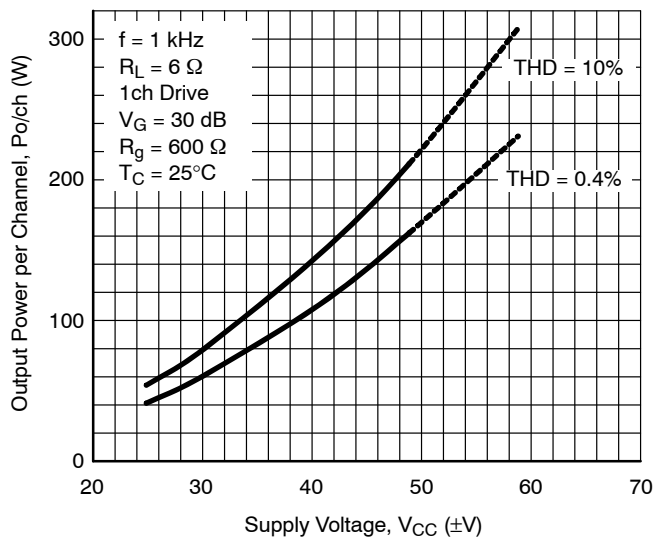


Figure 18. Po vs. VCC

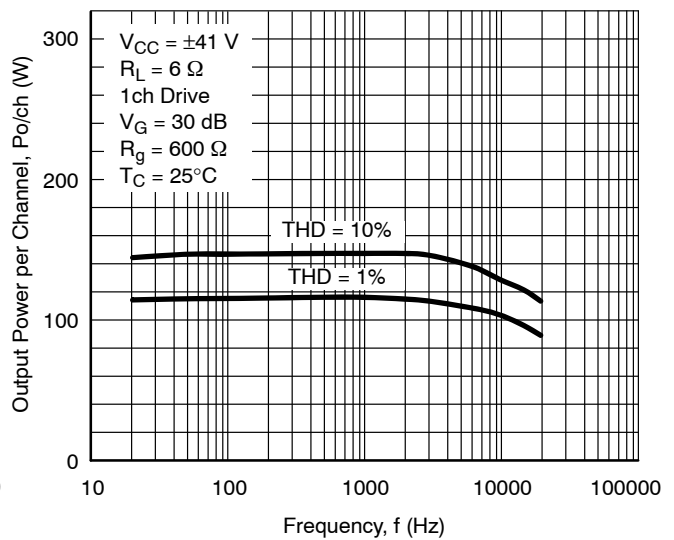


Figure 19. Po vs. f

CHARACTERISTIC OF EVALUATION BOARD - STK404-140N-E

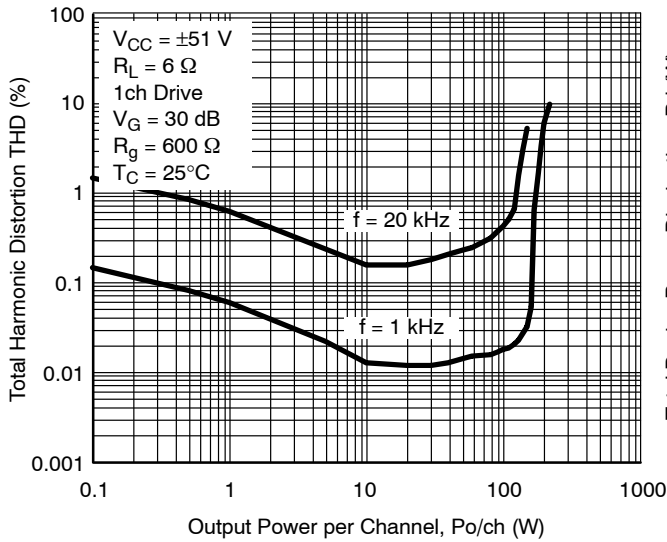


Figure 20. THD vs. Po

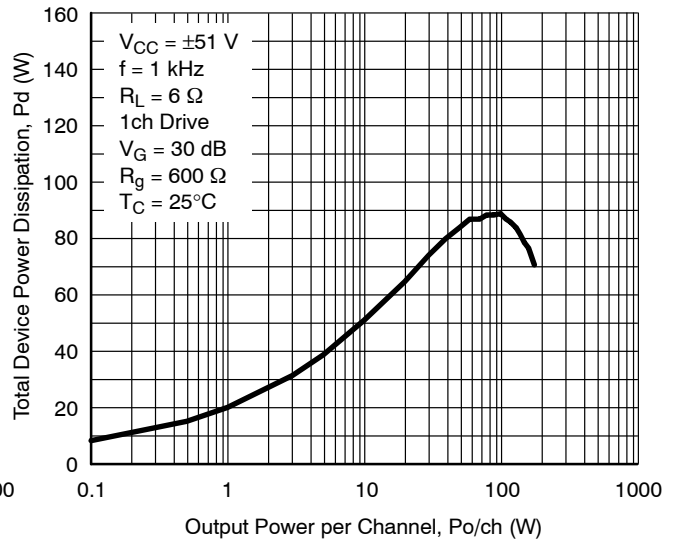


Figure 21. Pd vs. Po

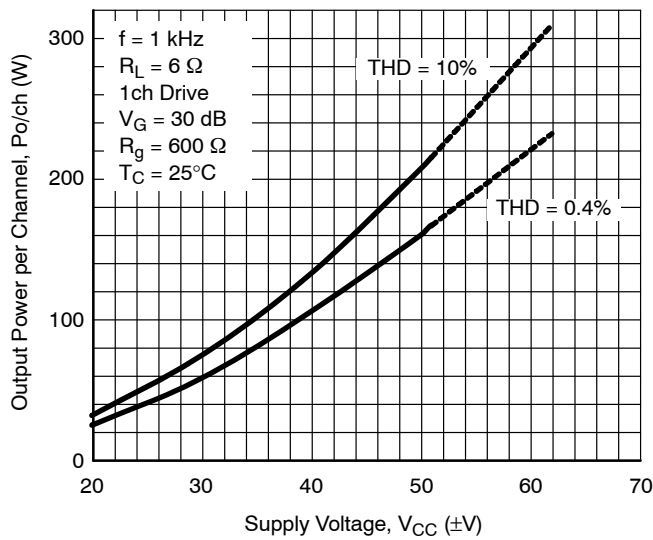


Figure 22. Po vs. VCC

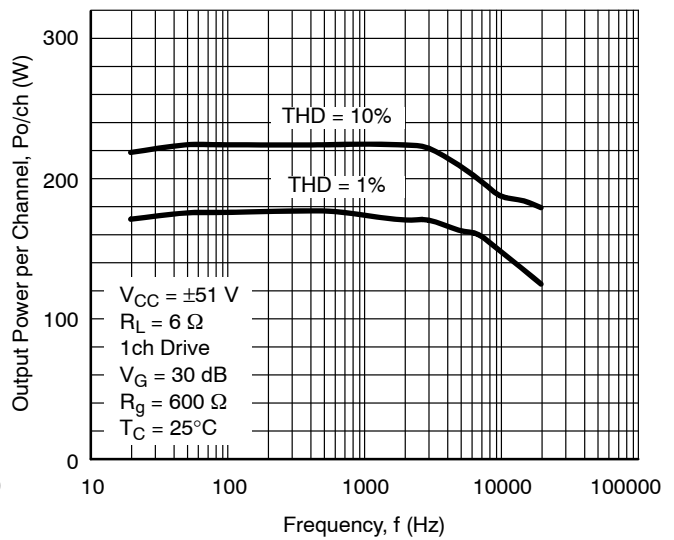


Figure 23. Po vs. f

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

STAND-BY CONTROL & MUTE CONTROL APPLICATION

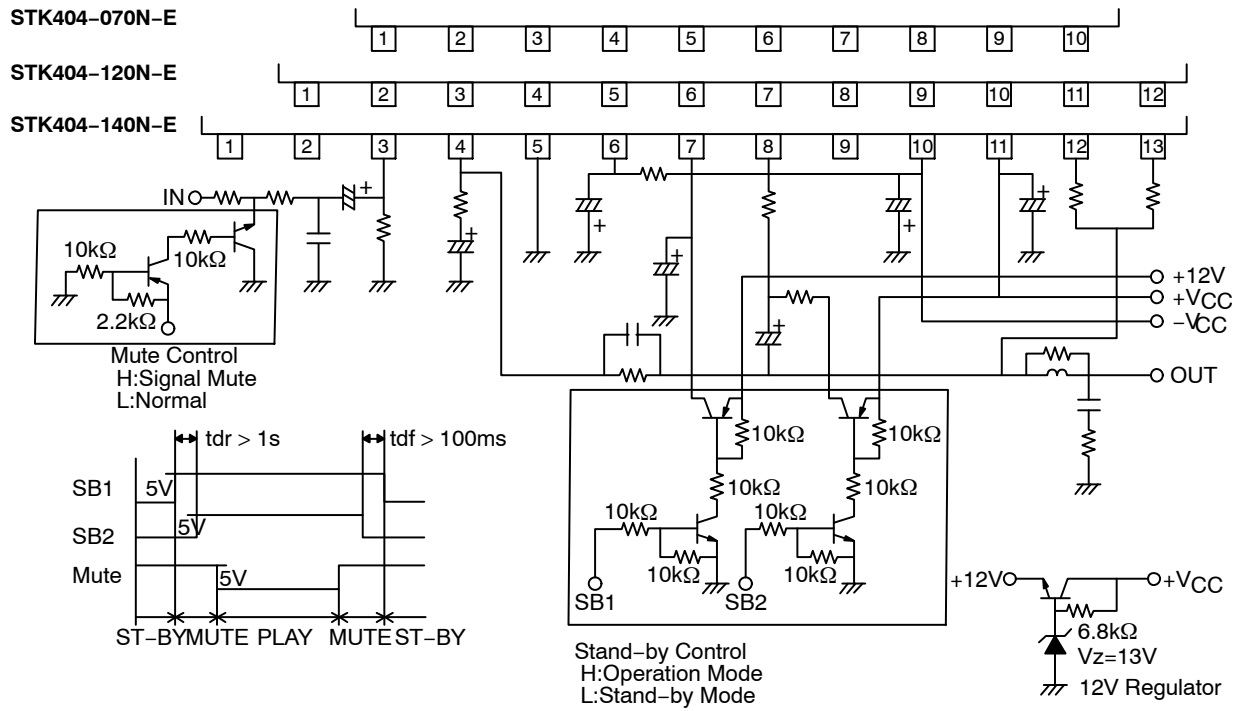


Figure 24. STK404-000-Ese Stand-by Control & Mute Control Application

THERMAL SHUT DOWN APPLICATION

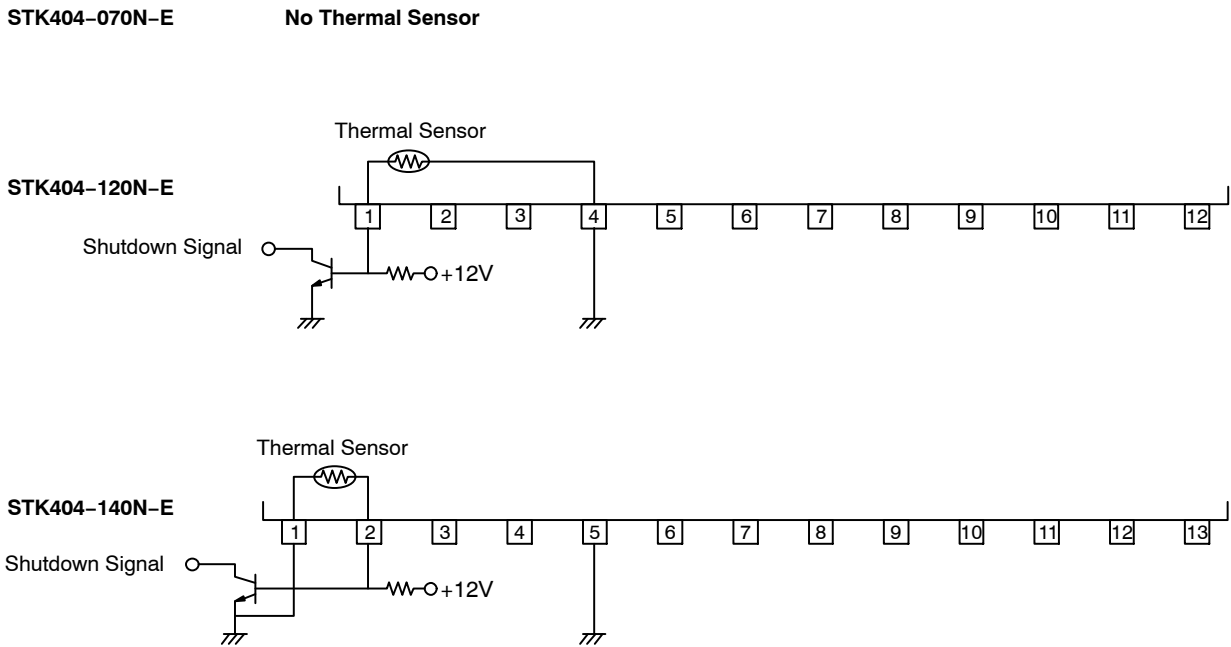


Figure 25. STK404-000-Esr Thermal Shut Down Application

THERMAL SENSOR CHARACTERISTIC

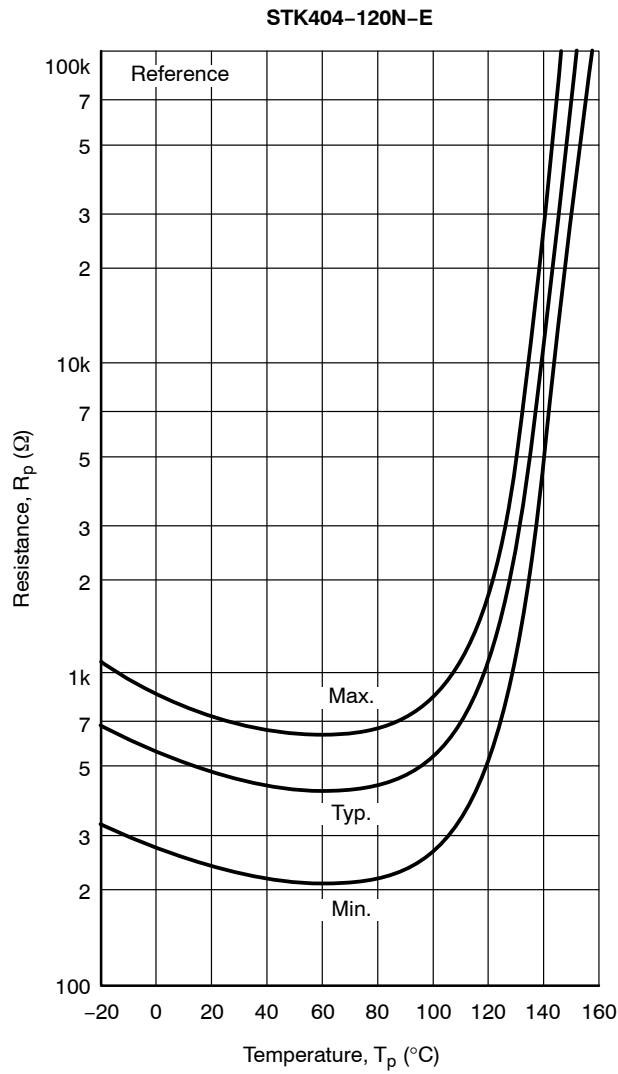


Figure 26. R_p vs. T_p

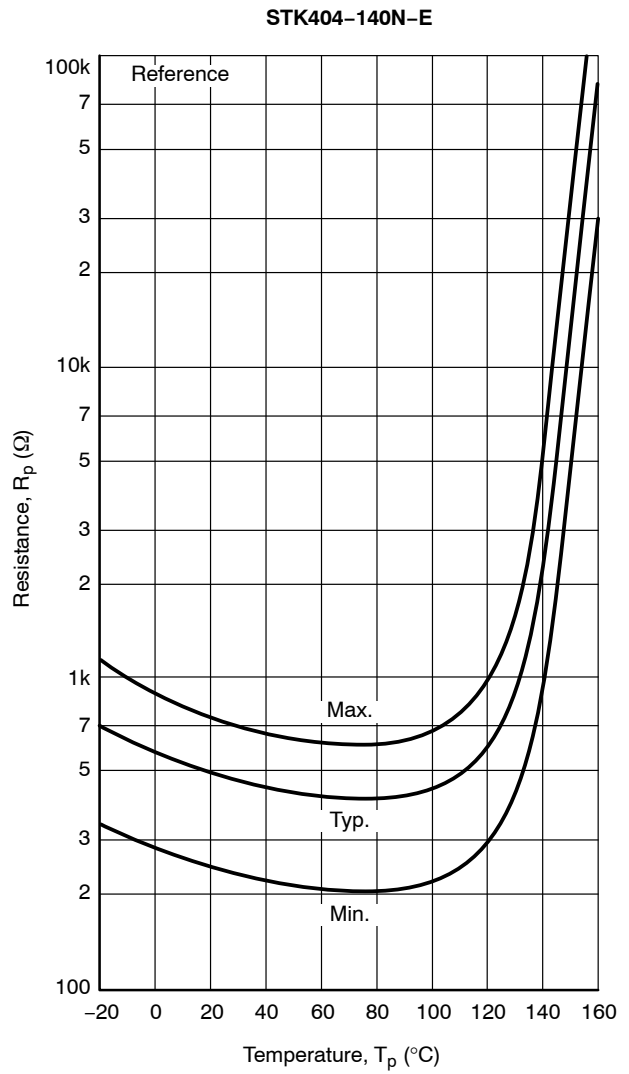


Figure 27. R_p vs. T_p

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

ROAD-SHORT & DC VOLTAGE PROTECTION APPLICATION

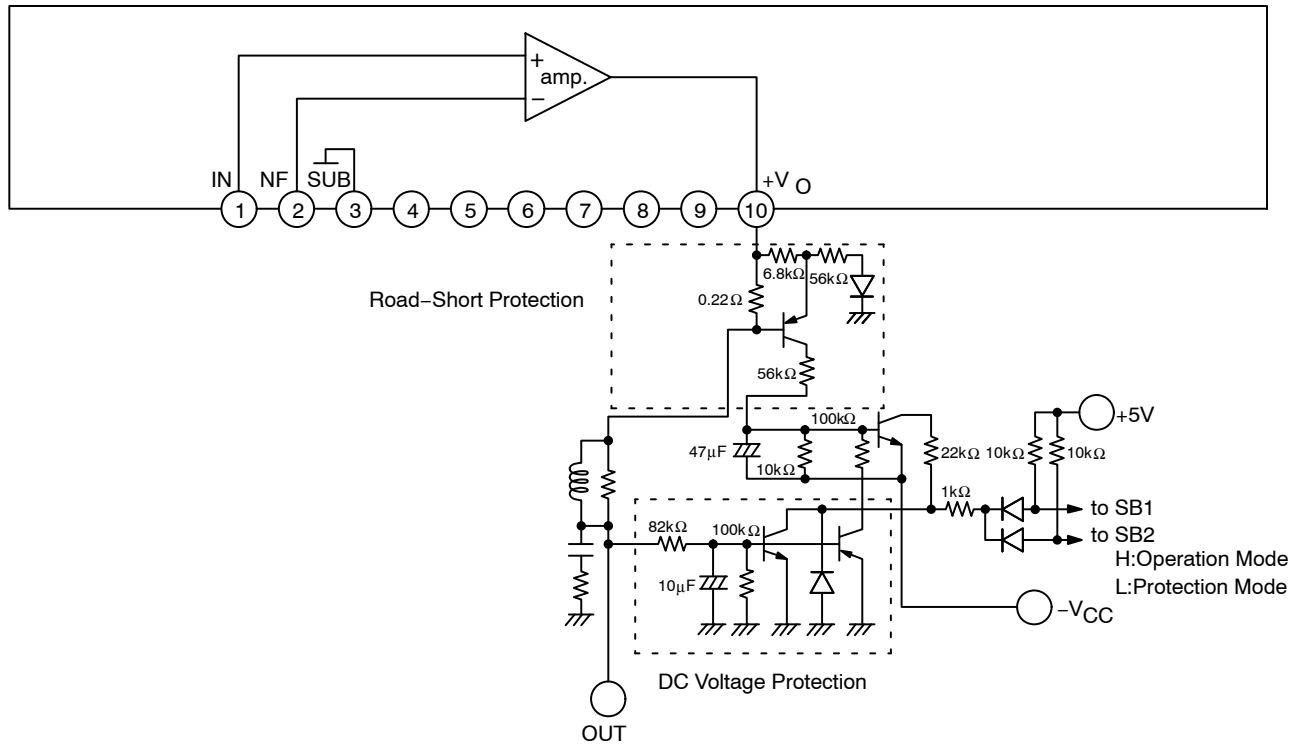


Figure 28. STK404-070N-E Road-short & DC Voltage Protection Application

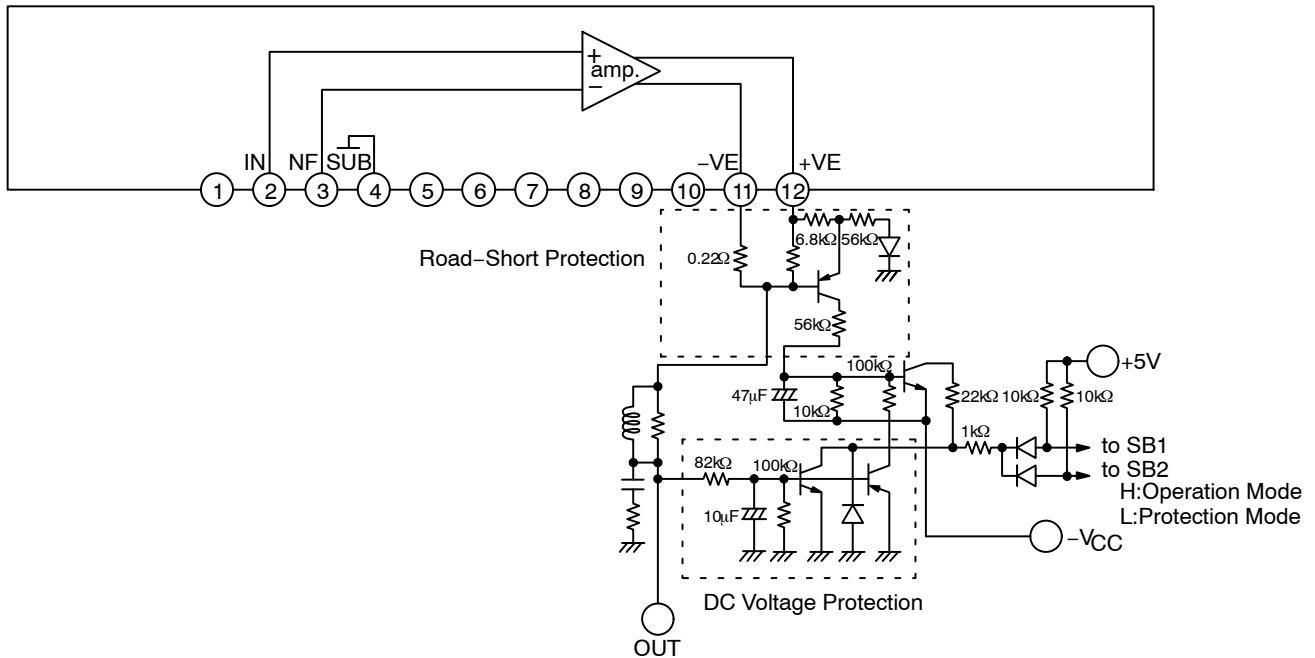


Figure 29. STK404-120N-E Road-short & DC Voltage Protection Application

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

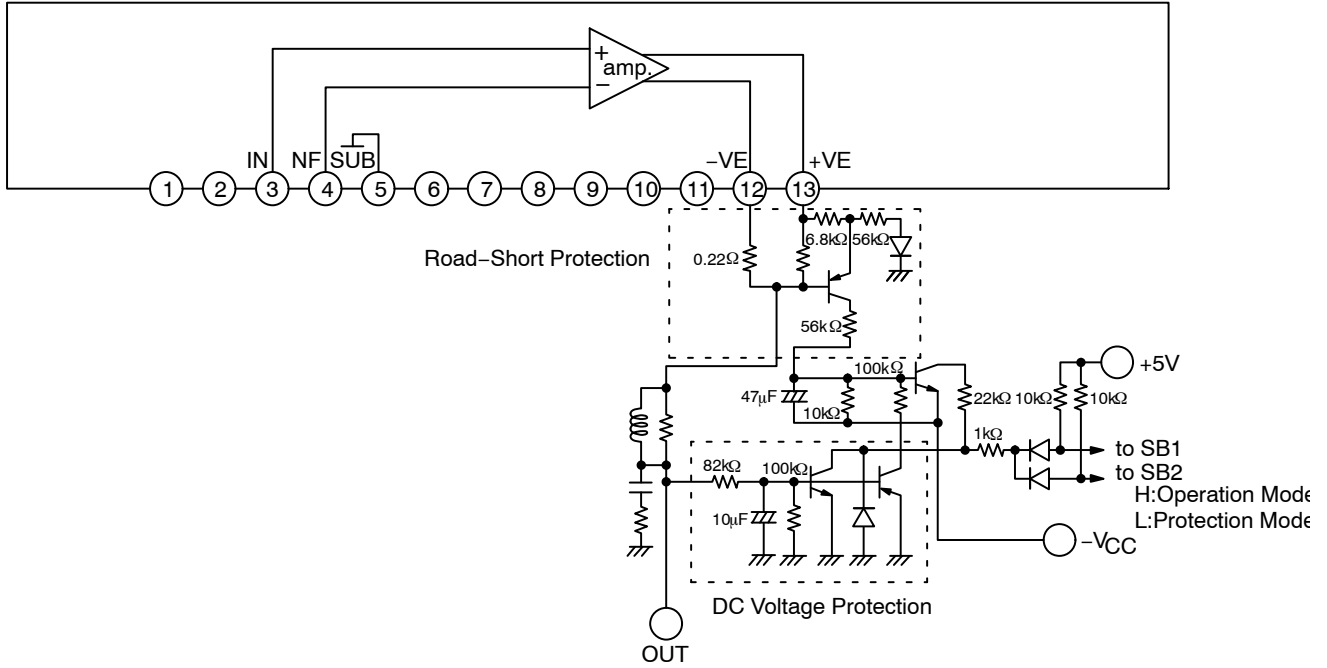


Figure 30. STK404-140N-E Road-short & DC Voltage Protection Application

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and will only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

THE BOARD IS PROVIDED BY ONSEMI TO YOU "AS IS" AND WITHOUT ANY REPRESENTATIONS OR WARRANTIES WHATSOEVER. WITHOUT LIMITING THE FOREGOING, ONSEMI (AND ITS LICENSORS/SUPPLIERS) HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES IN RELATION TO THE BOARD, ANY MODIFICATIONS, OR THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY AND ALL REPRESENTATIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, AND THOSE ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE CUSTOM OR TRADE PRACTICE.

onsemi reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by **onsemi** shall not constitute any representation or warranty by **onsemi**, and no additional obligations or liabilities shall arise from **onsemi** having provided such information or services.

onsemi products including the boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. You agree to indemnify, defend and hold harmless **onsemi**, its directors, officers, employees, representatives, agents, subsidiaries, affiliates, distributors, and assigns, against any and all liabilities, losses, costs, damages, judgments, and expenses, arising out of any claim, demand, investigation, lawsuit, regulatory action or cause of action arising out of or associated with any unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of any products and/or the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

FCC WARNING – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by **onsemi** to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

onsemi does not convey any license under its patent rights nor the rights of others.

LIMITATIONS OF LIABILITY: **onsemi** shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if **onsemi** is advised of the possibility of such damages. In no event shall **onsemi**'s aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

The board is provided to you subject to the license and other terms per **onsemi**'s standard terms and conditions of sale. For more information and documentation, please visit www.onsemi.com.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales