Ordering number: EN 1228C

Thick Film Hybrid IC

# STK4352

## AF Power Amplifier (7W + 7W min, THD = 1.0%)

## Features

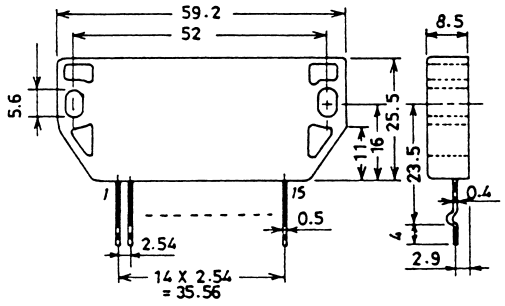
- Small and slim package with 25.5mm height.
- Capable of guaranteeing substrate temperature 125°C, thereby reducing heat sink.
- Excellent cost performance.

## Package Dimensions

unit: mm

**4032**

[STK4352]




## Specifications

### Maximum Ratings at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Maximum supply voltage | $V_{CC}$ max | Pin 4 to 7, 12 | 39 | V |
| Thermal resistance | θj-c | One power transistor | 7 | °C/W |
| Junction temperature | Tj | | 150 | °C |
| Operating substrate temperature | $T_C$ | | 125 | °C |
| Storage temperature | Tstg | | –30 to +125 | °C |
| Available time for load short-circuit | $t_s$ | $V_{CC}$ = 27V, $R_L$ = 8Ω, Po = 7W, f = 50Hz | 2 | s |

### Recommended Operating Conditions at Ta = 25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Recommended supply voltage | $V_{CC}$ | | 27 | V |
| Load resistance | $R_L$ | | 8 | Ω |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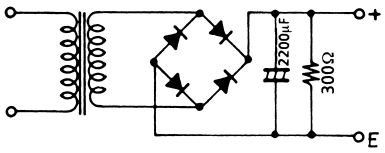
**Operating Characteristics** at Ta = 25°C, $V_{CC}$ = 27V, $R_L$ = 8Ω, Rg = 600Ω, VG = 40dB, at specified Test Circuit (based on Sample Application Circuit).

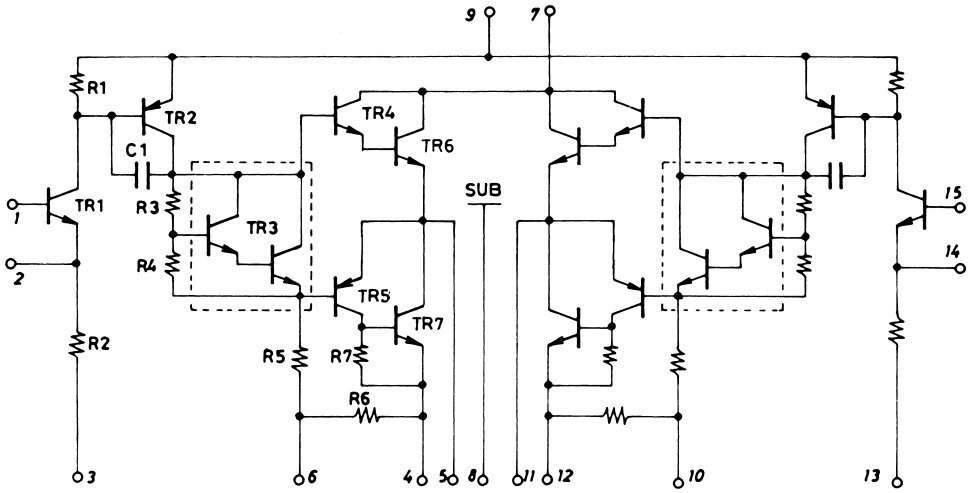
| Parameter | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Quiescent current | $I_{CCO}$ | $V_{CC}$ = 33V | 20 | 60 | 120 | mA |
| Output power | $P_O$ (1) | THD = 1.0%, f = 1kHz | 7 | | | W |
| | $P_O$ (2) | THD = 1.0%, f = 40Hz to 20kHz | 3.5 | | | W |
| Total harmonic distortion | THD | Po = 0.1W, f = 1kHz | | | 0.5 | % |
| Frequency response | $f_L$, $f_H$ | Po = 0.1W, $^{+0}_{-3}$ dB | | 40 to 50k | | Hz |
| Input impedance | $r_i$ | Po = 0.1W, f = 1kHz | | 110k | | Ω |
| Output noise voltage | $V_{NO}$ | $V_{CC}$ = 33V, Rg = 10kΩ | | | 0.8 | mVrms |

Notes. Unless otherwise specified for the power supply at the time of test, use the constant voltage power supply.
When testing the available time for load short-circuit and output noise voltage, use the specified transformer as shown right.
The output noise voltage is the peak value on the mean value indicating rms reading (VTVM), and should not involve impulse noise.

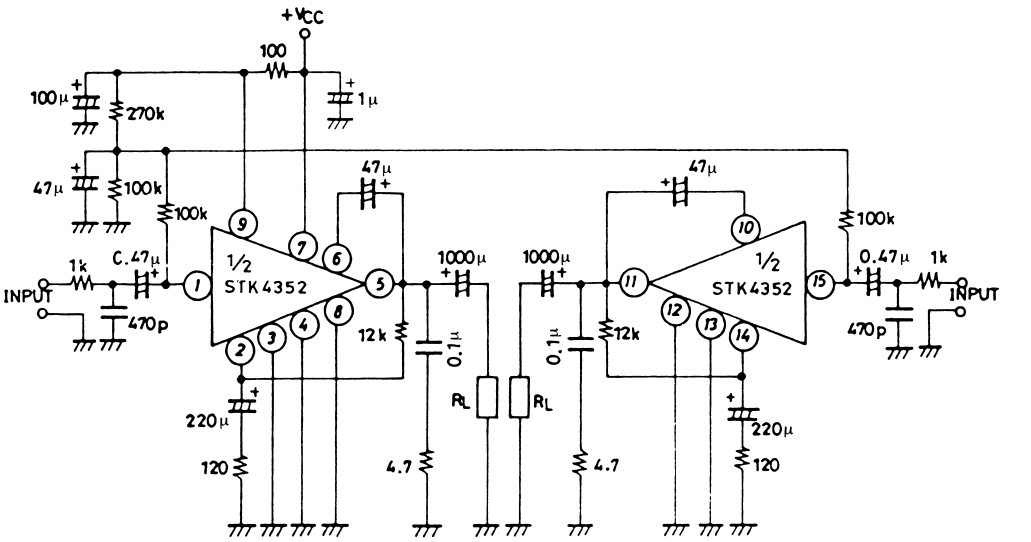



Specified Transformer Power Supply
(Equivalent to RP-22)

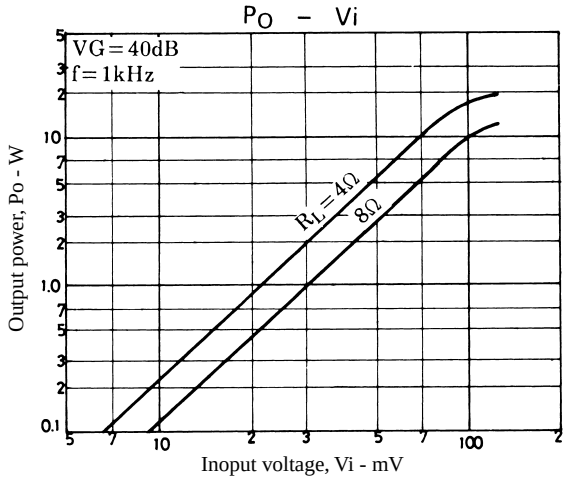
## Equivalent Circuit

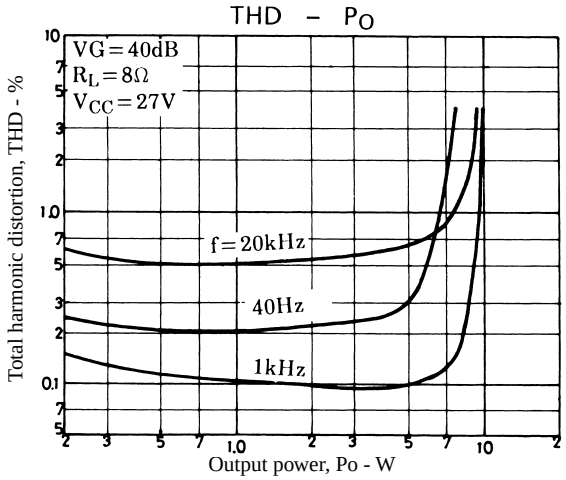


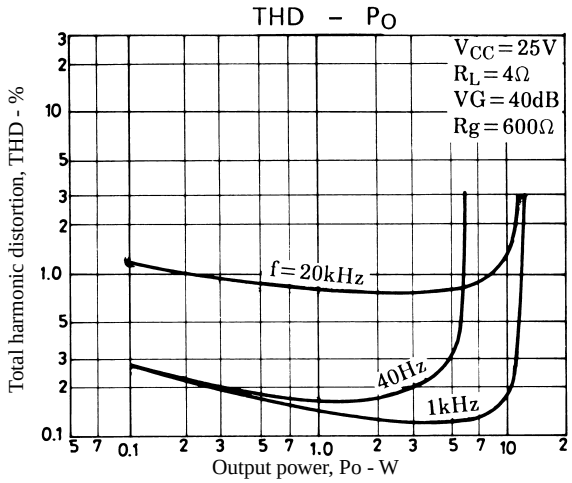
## Sample Application Circuit: 7W min 2-channel AF power amplifier

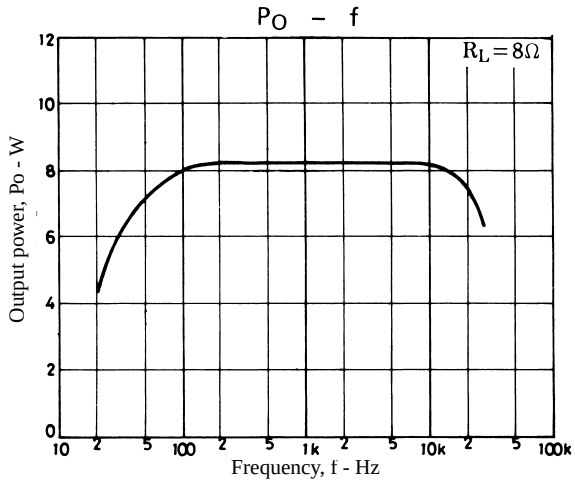


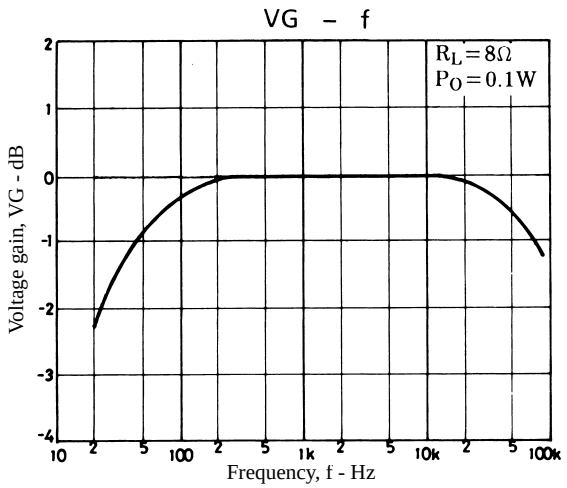

Unit (resistance: Ω, capacitance: F)

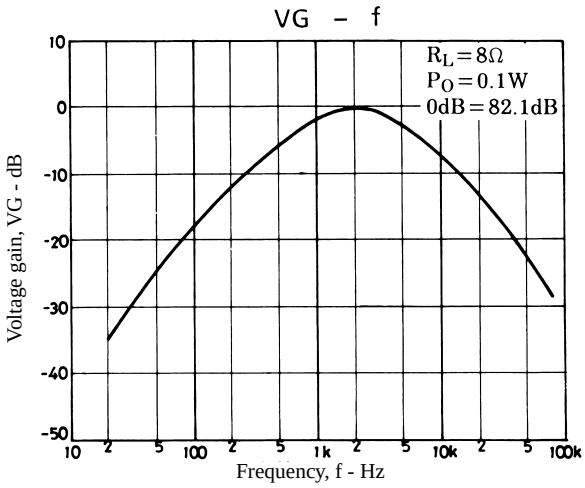


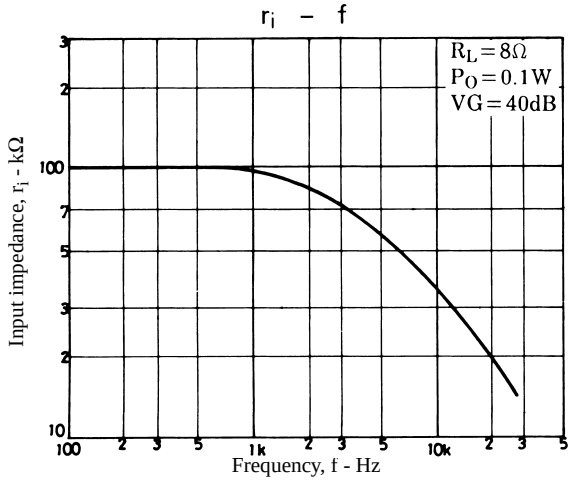



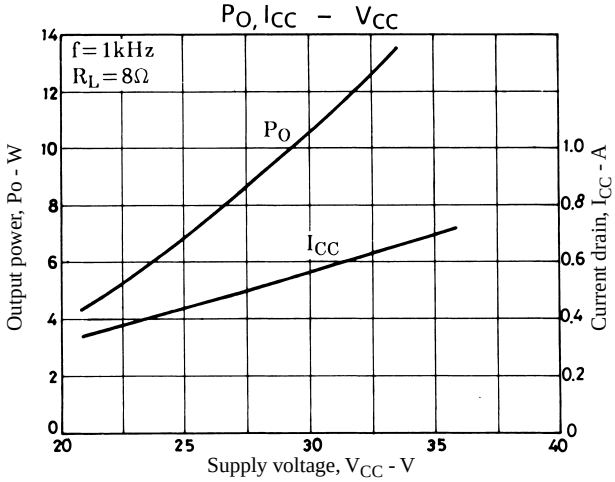



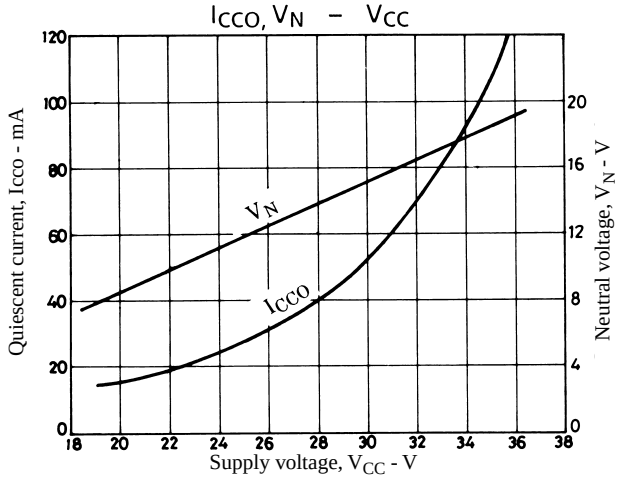



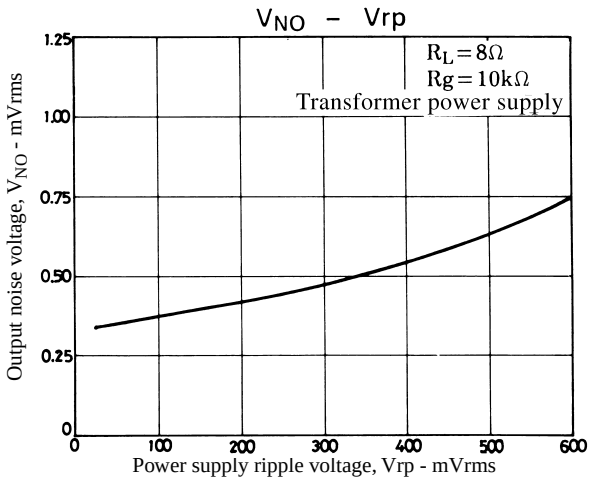

VG – f
$R_L = 8\Omega$
$P_O = 0.1W$
Voltage gain, VG - dB
Frequency, f - Hz

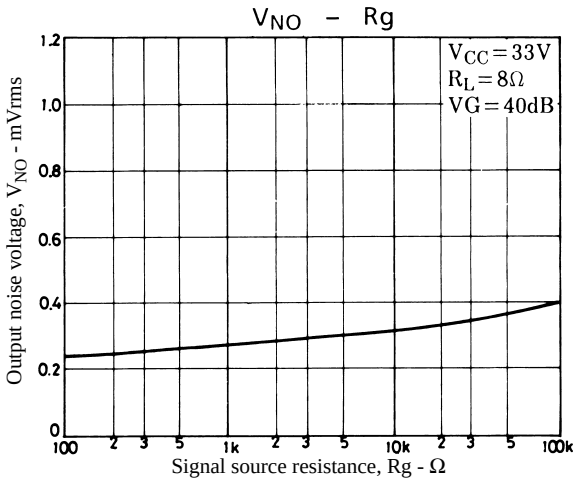

VG – f
$R_L = 8\Omega$
$P_O = 0.1W$
0dB = 82.1dB
Voltage gain, VG - dB
Frequency, f - Hz

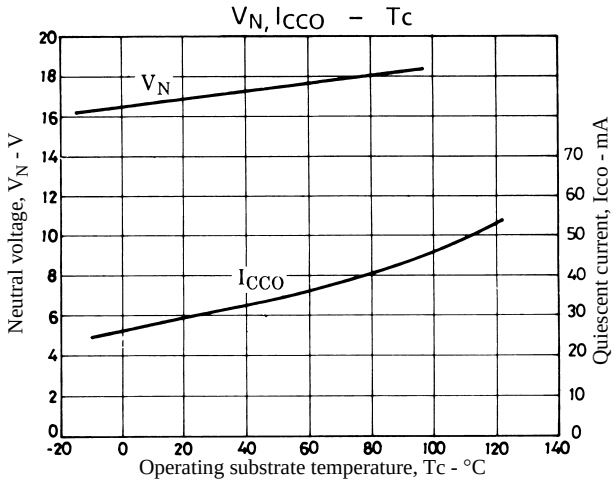

$r_i$ – f
$R_L = 8\Omega$
$P_O = 0.1W$
VG = 40dB
Input impedance, $r_i$ - kΩ
Frequency, f - Hz

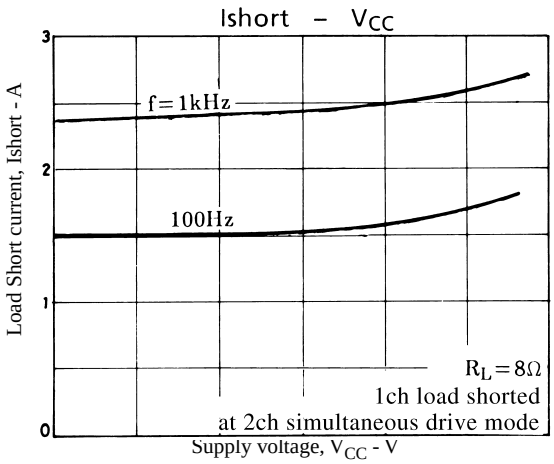

$P_O, I_{CC}$ – $V_{CC}$
f = 1kHz
$R_L = 8\Omega$
$P_O$
$I_{CC}$
Output power, Po - W
Current drain, $I_{CC}$ - A
Supply voltage, $V_{CC}$ - V

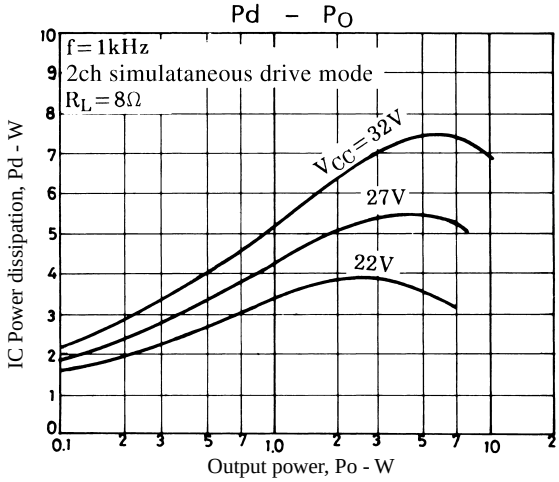

$I_{CCO}, V_N$ – $V_{CC}$
$V_N$
$I_{CCO}$
Quiescent current, Icco - mA
Neutral voltage, $V_N$ - V
Supply voltage, $V_{CC}$ - V

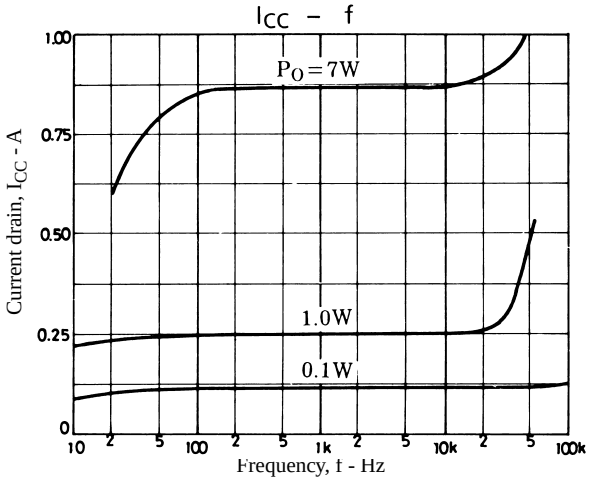

$V_{NO}$ – Vrp
$R_L = 8\Omega$
$Rg = 10k\Omega$
Transformer power supply
Output noise voltage, $V_{NO}$ - mVrms
Power supply ripple voltage, Vrp - mVrms

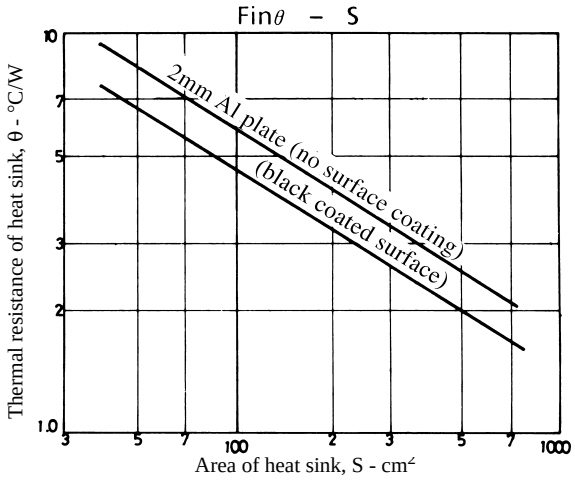

VNO – Rg
VCC = 33V
RL = 8Ω
VG = 40dB
Output noise voltage, VNO - mVrms
Signal source resistance, Rg - Ω


VN, ICCO – Tc
VN
ICCO
Neutral voltage, VN - V
Quiescent current, ICCO - mA
Operating substrate temperature, Tc - °C

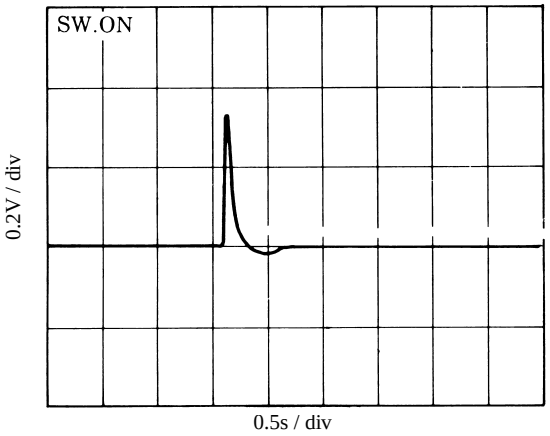

Ishort – VCC
f = 1kHz
100Hz
RL = 8Ω
1ch load shorted
at 2ch simultaneous drive mode
Load Short current, Ishort - A
Supply voltage, VCC - V


Pd – PO
f = 1kHz
2ch simulataneous drive mode
RL = 8Ω
VCC = 32V
27V
22V
IC Power dissipation, Pd - W
Output power, Po - W


ICC – f
PO = 7W
1.0W
0.1W
Current drain, ICC - A
Frequency, f - Hz


Finθ – S
2mm Al plate (no surface coating)
(black coated surface)
Thermal resistance of heat sink, θ - °C/W
Area of heat sink, S - cm²

Shock Noise Wave Form




Shock Noise Wave Form