

## STP185F38 Thermopile sensor

The STP185F38 is a new type CMOS compatible thermopile sensor, featuring good sensitivity, high reproducibility and reliability. A Thermistor chip is also provided inside the ceramic package for ambient temperature reference.

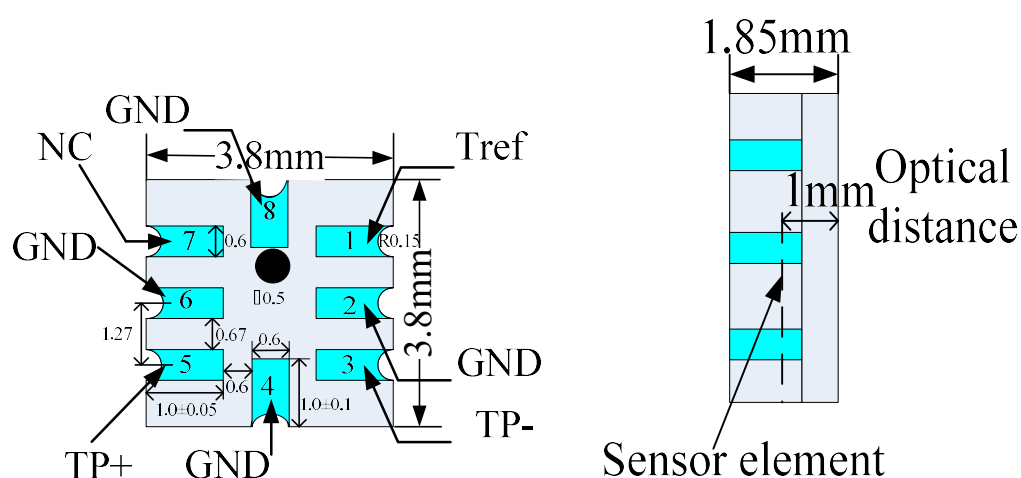
### Features

- Surface mount ceramic housing
- Thermistor temperature reference included
- High sensitivity

### Applications

- Non-contact temperature measurements
- General purpose thermometry

| Parameter             | Symbol            | Typ                 | Units                    | Remarks                         |
|-----------------------|-------------------|---------------------|--------------------------|---------------------------------|
| Sensitive area        | A                 | 1                   | mm <sup>2</sup>          | Absorber area                   |
| Thermopile resistance | R <sub>TP</sub>   | 75 ± 10             | K Ω                      |                                 |
| Responsivity          | R                 | 210 ± 50            | V/W                      | 500K, with filter cut-on 5.5 um |
| Time constant         | τ                 | 15                  | ms                       |                                 |
| Noise voltage         | V <sub>N</sub>    | 35.2                | nV/H<br>z <sup>1/2</sup> | 25° C                           |
| Specific detectivity  | D*                | 2.1*10 <sup>8</sup> | cmHz <sup>1/2</sup> /W   | 25° C                           |
| TC of resistance      | TC <sub>RTP</sub> | 0.08 ± 0.04         | %/K                      | -40° C ~100° C ambient          |
| Thermistor resistance |                   | 100 ± 5             | K Ω                      | 25° C                           |
| β-value               |                   | 3950 ± 20           | K                        | Defined at 25° C/50° C          |



R-T Table

| Temp.<br>(deg. C) | Rmax<br>(k Ohms) | Rnor<br>(k Ohms) | Rmin<br>(k Ohms) |
|-------------------|------------------|------------------|------------------|
| -20               | 1008.2715        | 975.8038         | 944.2871         |
| -19               | 950.6732         | 920.5962         | 891.3817         |
| -18               | 896.7294         | 868.8615         | 841.7754         |
| -17               | 846.1864         | 820.3603         | 795.2428         |
| -16               | 798.8093         | 774.8710         | 751.5750         |
| -15               | 754.3810         | 732.1889         | 710.5786         |
| -14               | 712.7005         | 692.1238         | 672.0741         |
| -13               | 673.5814         | 654.4999         | 635.8954         |
| -12               | 636.8513         | 619.1540         | 601.8883         |
| -11               | 602.3502         | 585.9346         | 569.9095         |
| -10               | 569.9298         | 554.7016         | 539.8262         |
| -9                | 539.4526         | 525.3245         | 511.5153         |
| -8                | 510.7906         | 497.6821         | 484.8615         |
| -7                | 483.8254         | 471.6621         | 459.7586         |
| -6                | 458.4467         | 447.1599         | 436.1073         |
| -5                | 434.5519         | 424.0781         | 413.8153         |
| -4                | 412.0460         | 402.3264         | 392.7968         |
| -3                | 390.8401         | 381.8204         | 372.9716         |
| -2                | 370.8519         | 362.4818         | 354.2653         |
| -1                | 352.0045         | 344.2375         | 336.6083         |
| 0                 | 334.2264         | 327.0195         | 319.9360         |
| 1                 | 317.4508         | 310.7640         | 304.1877         |
| 2                 | 301.6157         | 295.4121         | 289.3072         |
| 3                 | 286.6631         | 280.9084         | 275.2418         |
| 4                 | 272.5389         | 267.2014         | 261.9423         |
| 5                 | 259.1926         | 254.2428         | 249.3626         |
| 6                 | 246.5770         | 241.9877         | 237.4601         |
| 7                 | 234.6482         | 230.3940         | 226.1943         |
| 8                 | 223.3650         | 219.4224         | 215.5278         |
| 9                 | 212.6890         | 209.0361         | 205.4255         |
| 10                | 202.5840         | 199.2007         | 195.8544         |
| 11                | 193.0167         | 189.8841         | 186.7836         |
| 12                | 183.9552         | 181.0559         | 178.1844         |
| 13                | 175.3704         | 172.6881         | 170.0298         |
| 14                | 167.2345         | 164.7540         | 162.2942         |
| 15                | 159.5216         | 157.2290         | 154.9539         |
| 16                | 152.2075         | 150.0898         | 147.9867         |
| 17                | 145.2694         | 143.3144         | 141.3716         |
| 18                | 138.6861         | 136.8825         | 135.0889         |
| 19                | 132.4375         | 130.7749         | 129.1202         |

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|----|----------|----------|----------|
| 20 | 126.5049 | 124.9734 | 123.4482 |
| 21 | 120.8705 | 119.4612 | 118.0564 |
| 22 | 115.5180 | 114.2223 | 112.9298 |
| 23 | 110.4316 | 109.2417 | 108.0537 |
| 24 | 105.5969 | 104.5053 | 103.4147 |
| 25 | 101.0000 | 100.0000 | 99.0000  |
| 26 | 96.7127  | 95.7132  | 94.7146  |
| 27 | 92.6306  | 91.6333  | 90.6378  |
| 28 | 88.7426  | 87.7492  | 86.7583  |
| 29 | 85.0386  | 84.0505  | 83.0655  |
| 30 | 81.5090  | 80.5274  | 79.5497  |
| 31 | 78.1446  | 77.1707  | 76.2012  |
| 32 | 74.9370  | 73.9717  | 73.0115  |
| 33 | 71.8779  | 70.9222  | 69.9721  |
| 34 | 68.9598  | 68.0144  | 67.0752  |
| 35 | 66.1755  | 65.2411  | 64.3134  |
| 36 | 63.5182  | 62.5954  | 61.6798  |
| 37 | 60.9814  | 60.0707  | 59.1677  |
| 38 | 58.5591  | 57.6610  | 56.7710  |
| 39 | 56.2456  | 55.3604  | 54.4837  |
| 40 | 54.0355  | 53.1635  | 52.3004  |
| 41 | 51.9235  | 51.0651  | 50.2158  |
| 42 | 49.9049  | 49.0602  | 48.2250  |
| 43 | 47.9752  | 47.1443  | 46.3232  |
| 44 | 46.1298  | 45.3130  | 44.5062  |
| 45 | 44.3649  | 43.5621  | 42.7696  |
| 46 | 42.6764  | 41.8878  | 41.1096  |
| 47 | 41.0607  | 40.2862  | 39.5224  |
| 48 | 39.5143  | 38.7539  | 38.0044  |
| 49 | 38.0339  | 37.2876  | 36.5524  |
| 50 | 36.6163  | 35.8842  | 35.1631  |
| 51 | 35.2587  | 34.5405  | 33.8335  |
| 52 | 33.9582  | 33.2538  | 32.5608  |
| 53 | 32.7121  | 32.0214  | 31.3423  |
| 54 | 31.5178  | 30.8408  | 30.1754  |
| 55 | 30.3731  | 29.7096  | 29.0576  |
| 56 | 29.2755  | 28.6253  | 27.9868  |
| 57 | 28.2230  | 27.5860  | 26.9607  |
| 58 | 27.2135  | 26.5895  | 25.9772  |
| 59 | 26.2450  | 25.6338  | 25.0343  |
| 60 | 25.3156  | 24.7171  | 24.1303  |
| 61 | 24.4237  | 23.8376  | 23.2633  |
| 62 | 23.5675  | 22.9937  | 22.4315  |

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|-----|---------|---------|---------|
| 63  | 22.7454 | 22.1836 | 21.6336 |
| 64  | 21.9560 | 21.4061 | 20.8678 |
| 65  | 21.1977 | 20.6594 | 20.1328 |
| 66  | 20.4692 | 19.9424 | 19.4272 |
| 67  | 19.7693 | 19.2537 | 18.7497 |
| 68  | 19.0966 | 18.5920 | 18.0990 |
| 69  | 18.4499 | 17.9562 | 17.4740 |
| 70  | 17.8282 | 17.3452 | 16.8735 |
| 71  | 17.2304 | 16.7578 | 16.2965 |
| 72  | 16.6554 | 16.1930 | 15.7419 |
| 73  | 16.1023 | 15.6499 | 15.2087 |
| 74  | 15.5702 | 15.1276 | 14.6961 |
| 75  | 15.0581 | 14.6251 | 14.2032 |
| 76  | 14.5652 | 14.1417 | 13.7291 |
| 77  | 14.0907 | 13.6764 | 13.2729 |
| 78  | 13.6339 | 13.2286 | 12.8341 |
| 79  | 13.1940 | 12.7976 | 12.4118 |
| 80  | 12.7703 | 12.3825 | 12.0053 |
| 81  | 12.3622 | 11.9828 | 11.6139 |
| 82  | 11.9689 | 11.5978 | 11.2372 |
| 83  | 11.5900 | 11.2270 | 10.8743 |
| 84  | 11.2247 | 10.8697 | 10.5248 |
| 85  | 10.8727 | 10.5254 | 10.1881 |
| 86  | 10.5332 | 10.1935 | 9.8637  |
| 87  | 10.2059 | 9.8736  | 9.5511  |
| 88  | 9.8902  | 9.5652  | 9.2499  |
| 89  | 9.5858  | 9.2678  | 8.9594  |
| 90  | 9.2920  | 8.9809  | 8.6794  |
| 91  | 9.0085  | 8.7042  | 8.4094  |
| 92  | 8.7350  | 8.4373  | 8.1489  |
| 93  | 8.4710  | 8.1797  | 7.8977  |
| 94  | 8.2161  | 7.9312  | 7.6554  |
| 95  | 7.9700  | 7.6912  | 7.4215  |
| 96  | 7.7324  | 7.4596  | 7.1958  |
| 97  | 7.5029  | 7.2360  | 6.9780  |
| 98  | 7.2812  | 7.0201  | 6.7677  |
| 99  | 7.0670  | 6.8115  | 6.5647  |
| 100 | 6.8601  | 6.6101  | 6.3686  |

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