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MCH3007

RF Transistor

12V, 30mA, $f_T=8\text{GHz}$, NPN Single MCPH3

ON Semiconductor®

<http://onsemi.com>

Features

- Low-noise use : $NF=1.2\text{dB}$ typ ($f=1\text{GHz}$)
- High cut-off frequency : $f_T=8\text{GHz}$ typ ($V_{CE}=5\text{V}$)
- High gain : $|S_{21e}|^2=12\text{dB}$ typ ($f=1\text{GHz}$)
- Halogen free compliance

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

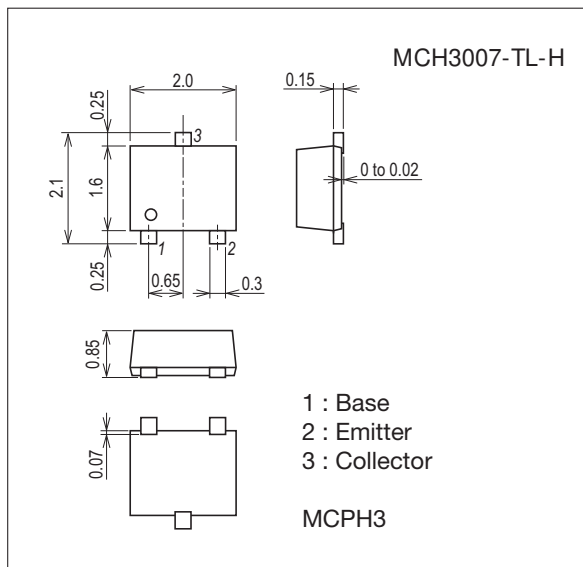
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to- Base Voltage | V_{CBO} | | 20 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | 12 | V |
| Emitter-to-Base Voltage | V_{EBO} | | 2 | V |
| Collector Current | I_C | | 30 | mA |
| Collector Dissipation | P_C | | 350 | mW |
| Junction Temperature | T_j | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

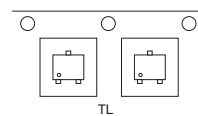
7019A-004



Product & Package Information

- Package : MCPH3
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

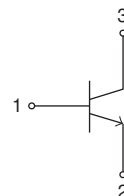
Packing Type : TL



Marking



Electrical Connection



MCH3007

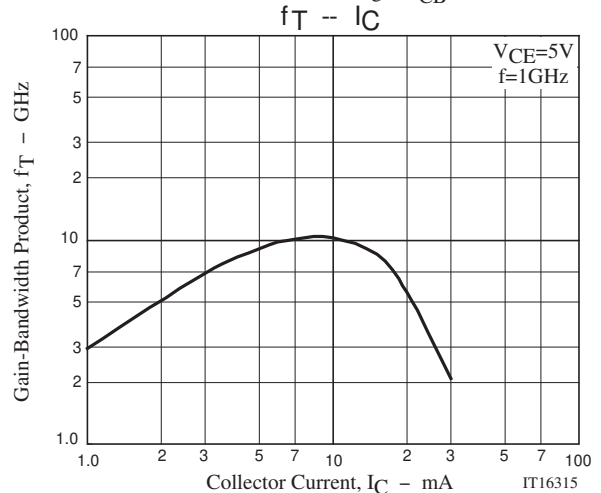
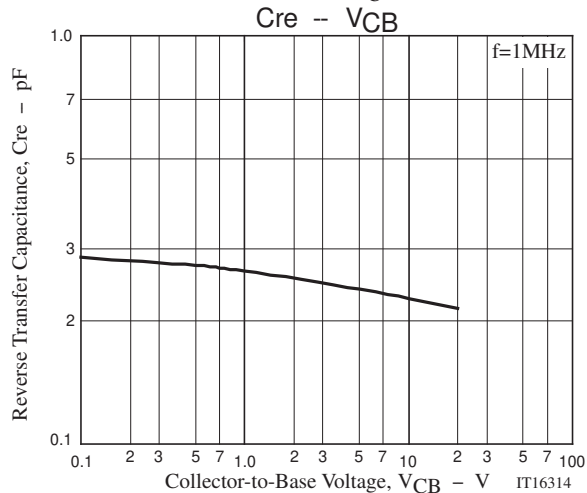
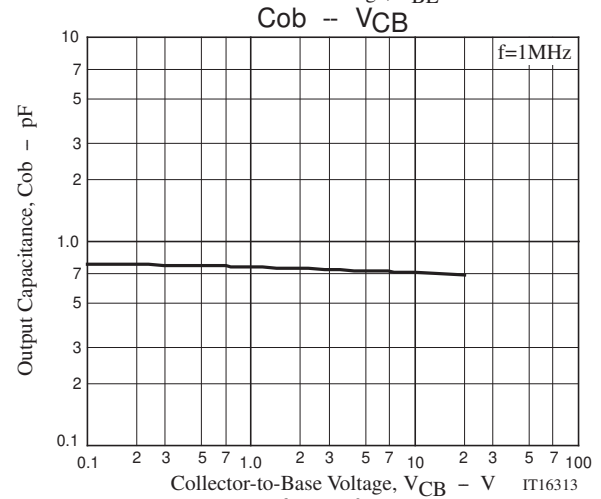
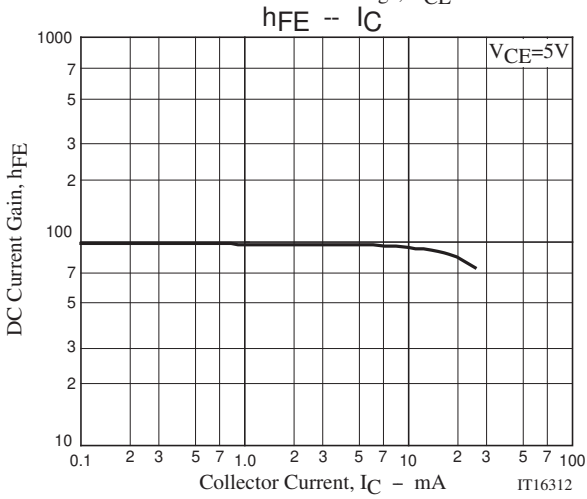
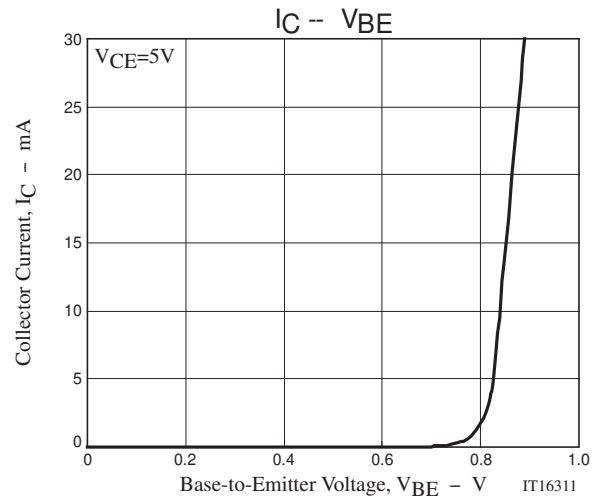
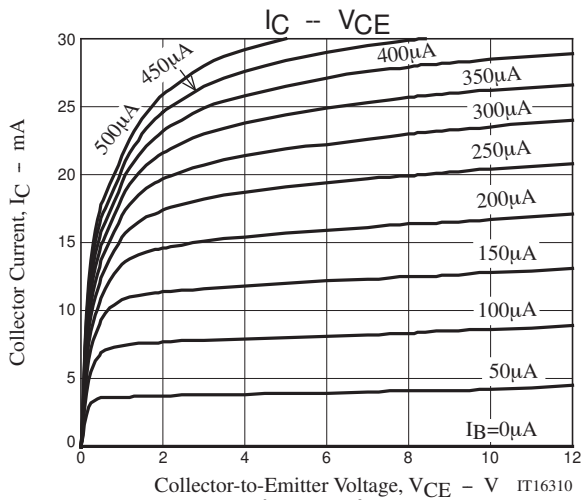
Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--------------------------|---------------|-------------------------------|---------|-----|-----|---------|
| | | | min | typ | max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB}=5V, I_E=0A$ | | | 1.0 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=1V, I_C=0A$ | | | 1.0 | μA |
| DC Current Gain | h_{FE} | $V_{CE}=5V, I_C=5mA$ | 60 | | 150 | |
| Gain-Bandwidth Product | f_T | $V_{CE}=5V, I_C=10mA$ | 6 | 8 | | GHz |
| Forward Transfer Gain | $ S_{21e} ^2$ | $V_{CE}=5V, I_C=10mA, f=1GHz$ | 9 | 12 | | dB |
| Noise Figure | NF | $V_{CE}=5V, I_C=10mA, f=1GHz$ | | 1.2 | 1.8 | dB |

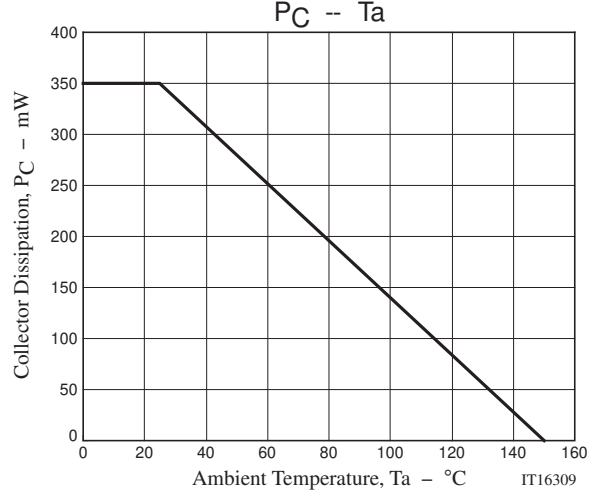
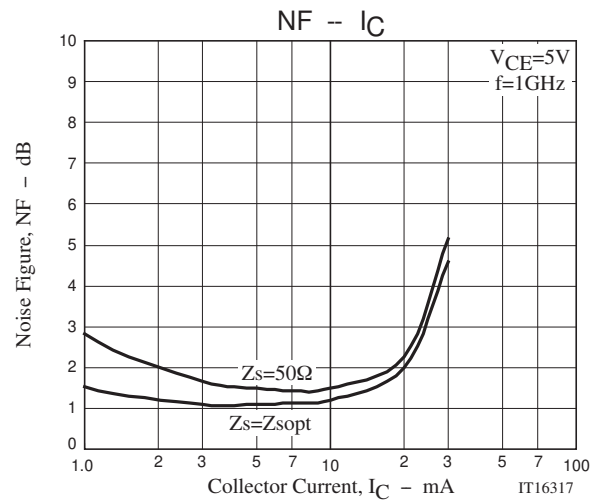
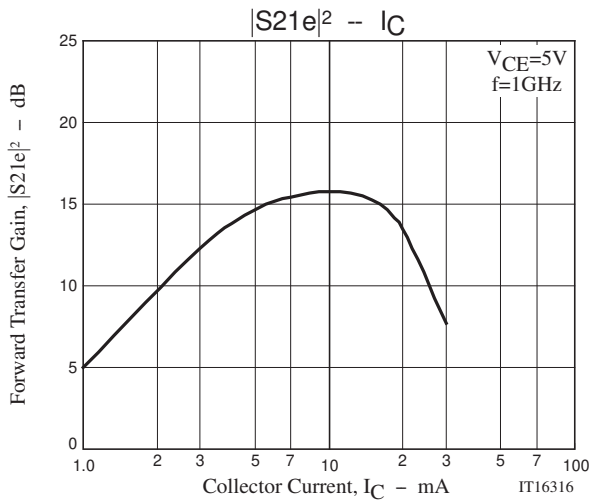
Pay attention to handling since it is liable to be affected by static electricity due to the high-frequency process adopted.

Ordering Information

| Device | Package | Shipping | memo |
|--------------|---------|----------------|--------------------------|
| MCH3007-TL-H | MCPH3 | 3,000pcs./reel | Pb Free and Halogen Free |



MCH3007



S Parameters (Common emitter)

$V_{CE}=3V, I_C=5mA$

| Freq(MHz) | $ S_{11} $ | $\angle S_{11}$ | $ S_{21} $ | $\angle S_{21}$ | $ S_{12} $ | $\angle S_{12}$ | $ S_{22} $ | $\angle S_{22}$ |
|-----------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|
| 100 | 0.889 | -11.8 | 9.020 | 164.0 | 0.011 | 87.1 | 0.978 | -9.1 |
| 200 | 0.872 | -18.1 | 8.560 | 151.7 | 0.026 | 81.8 | 0.945 | -17.9 |
| 300 | 0.802 | -32.2 | 8.281 | 142.9 | 0.037 | 77.5 | 0.892 | -25.3 |
| 400 | 0.784 | -37.9 | 7.883 | 136.4 | 0.046 | 74.5 | 0.843 | -32.1 |
| 500 | 0.687 | -55.5 | 7.588 | 125.7 | 0.057 | 71.6 | 0.771 | -39.3 |
| 600 | 0.651 | -64.3 | 7.221 | 119.3 | 0.065 | 70.4 | 0.724 | -43.5 |
| 700 | 0.591 | -76.2 | 6.686 | 111.7 | 0.073 | 69.0 | 0.675 | -48.4 |
| 800 | 0.535 | -85.9 | 6.254 | 105.1 | 0.080 | 68.2 | 0.632 | -52.3 |
| 900 | 0.498 | 266.2 | 5.783 | 100.0 | 0.086 | 67.7 | 0.598 | -55.7 |
| 1000 | 0.450 | 258.0 | 5.404 | 94.8 | 0.093 | 67.9 | 0.562 | -58.4 |
| 1200 | 0.389 | 244.7 | 4.684 | 86.9 | 0.105 | 68.1 | 0.514 | -63.0 |
| 1400 | 0.352 | 234.1 | 4.101 | 80.8 | 0.118 | 68.7 | 0.482 | -66.0 |
| 1600 | 0.322 | 224.9 | 3.651 | 75.6 | 0.131 | 69.4 | 0.463 | -68.3 |
| 1800 | 0.300 | 216.6 | 3.291 | 70.9 | 0.146 | 70.1 | 0.447 | -70.1 |
| 2000 | 0.282 | 208.5 | 3.004 | 66.6 | 0.161 | 70.5 | 0.437 | -71.9 |
| 2200 | 0.266 | 200.9 | 2.776 | 62.6 | 0.177 | 70.7 | 0.435 | -73.7 |
| 2400 | 0.258 | 193.5 | 2.586 | 58.5 | 0.194 | 70.6 | 0.433 | -76.6 |
| 2600 | 0.246 | 186.5 | 2.415 | 55.0 | 0.211 | 70.5 | 0.428 | -78.6 |
| 2800 | 0.243 | 180.9 | 2.292 | 51.7 | 0.231 | 70.4 | 0.435 | -80.0 |
| 3000 | 0.250 | 174.2 | 2.191 | 47.7 | 0.252 | 69.3 | 0.450 | -83.4 |

MCH3007

S Parameters (Common emitter)

V_{CE}=3V, I_C=10mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.772 | -19.6 | 14.343 | 158.2 | 0.013 | 80.2 | 0.952 | -12.0 |
| 200 | 0.726 | -30.9 | 13.500 | 143.9 | 0.022 | 77.5 | 0.880 | -22.0 |
| 300 | 0.614 | -53.6 | 12.251 | 130.6 | 0.031 | 75.2 | 0.798 | -28.8 |
| 400 | 0.570 | -64.5 | 11.116 | 122.3 | 0.038 | 74.7 | 0.734 | -34.3 |
| 500 | 0.471 | -86.8 | 9.957 | 110.0 | 0.046 | 74.0 | 0.660 | -40.2 |
| 600 | 0.440 | 262.6 | 8.696 | 103.7 | 0.053 | 74.4 | 0.616 | -43.1 |
| 700 | 0.404 | 251.3 | 7.844 | 97.4 | 0.061 | 74.8 | 0.577 | -46.7 |
| 800 | 0.380 | 242.5 | 6.991 | 92.7 | 0.068 | 75.3 | 0.543 | -49.6 |
| 900 | 0.362 | 235.0 | 6.325 | 88.6 | 0.075 | 75.7 | 0.519 | -52.1 |
| 1000 | 0.344 | 228.3 | 5.731 | 85.1 | 0.083 | 76.0 | 0.492 | -54.3 |
| 1200 | 0.321 | 216.8 | 4.838 | 79.0 | 0.098 | 76.7 | 0.461 | -58.0 |
| 1400 | 0.308 | 207.2 | 4.189 | 74.0 | 0.113 | 77.0 | 0.443 | -60.4 |
| 1600 | 0.296 | 199.1 | 3.703 | 69.6 | 0.129 | 77.2 | 0.434 | -62.6 |
| 1800 | 0.287 | 191.6 | 3.324 | 65.5 | 0.146 | 77.2 | 0.428 | -64.4 |
| 2000 | 0.282 | 184.3 | 3.023 | 61.6 | 0.164 | 76.9 | 0.425 | -66.3 |
| 2200 | 0.275 | 177.4 | 2.784 | 57.9 | 0.182 | 76.5 | 0.429 | -68.5 |
| 2400 | 0.274 | 171.5 | 2.591 | 54.2 | 0.201 | 75.7 | 0.432 | -71.7 |
| 2600 | 0.269 | 165.4 | 2.413 | 50.8 | 0.220 | 75.1 | 0.432 | -74.0 |
| 2800 | 0.270 | 160.9 | 2.285 | 47.8 | 0.242 | 74.3 | 0.442 | -75.8 |
| 3000 | 0.281 | 155.9 | 2.182 | 44.0 | 0.266 | 72.7 | 0.460 | -79.7 |

V_{CE}=3V, I_C=15mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.655 | -30.6 | 16.942 | 153.3 | 0.011 | 76.6 | 0.912 | -13.3 |
| 200 | 0.578 | -51.1 | 14.095 | 136.7 | 0.020 | 73.6 | 0.814 | -22.0 |
| 300 | 0.473 | -82.5 | 12.741 | 120.1 | 0.026 | 73.3 | 0.735 | -26.7 |
| 400 | 0.432 | 260.6 | 11.464 | 110.2 | 0.033 | 74.3 | 0.682 | -30.1 |
| 500 | 0.403 | 240.3 | 9.665 | 100.5 | 0.039 | 75.4 | 0.624 | -34.4 |
| 600 | 0.395 | 230.3 | 7.746 | 94.9 | 0.045 | 77.1 | 0.595 | -36.4 |
| 700 | 0.390 | 220.9 | 6.764 | 89.7 | 0.052 | 79.1 | 0.570 | -39.3 |
| 800 | 0.387 | 213.3 | 5.958 | 85.7 | 0.059 | 80.2 | 0.547 | -41.8 |
| 900 | 0.386 | 207.3 | 5.331 | 81.9 | 0.067 | 81.4 | 0.533 | -44.0 |
| 1000 | 0.381 | 201.6 | 4.798 | 78.8 | 0.074 | 82.1 | 0.515 | -46.2 |
| 1200 | 0.379 | 192.3 | 4.009 | 73.0 | 0.090 | 83.1 | 0.498 | -50.2 |
| 1400 | 0.380 | 184.7 | 3.460 | 68.0 | 0.106 | 83.8 | 0.491 | -53.3 |
| 1600 | 0.378 | 178.1 | 3.047 | 63.5 | 0.124 | 84.1 | 0.491 | -56.3 |
| 1800 | 0.378 | 171.9 | 2.733 | 59.3 | 0.143 | 83.9 | 0.491 | -59.2 |
| 2000 | 0.380 | 165.9 | 2.482 | 55.2 | 0.162 | 83.7 | 0.493 | -62.2 |
| 2200 | 0.379 | 160.0 | 2.282 | 51.4 | 0.183 | 83.0 | 0.502 | -65.4 |
| 2400 | 0.383 | 155.1 | 2.118 | 47.5 | 0.205 | 82.0 | 0.508 | -69.5 |
| 2600 | 0.383 | 149.7 | 1.968 | 44.0 | 0.227 | 81.0 | 0.510 | -72.8 |
| 2800 | 0.386 | 145.4 | 1.860 | 40.8 | 0.253 | 79.8 | 0.523 | -75.6 |
| 3000 | 0.398 | 141.2 | 1.771 | 36.9 | 0.280 | 77.7 | 0.544 | -80.4 |

MCH3007

S Parameters (Common emitter)

V_{CE}=3V, I_C=20mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.542 | -48.6 | 17.664 | 147.6 | 0.011 | 72.1 | 0.855 | -13.7 |
| 200 | 0.472 | -85.2 | 13.659 | 127.1 | 0.018 | 65.7 | 0.759 | -19.6 |
| 300 | 0.442 | 241.9 | 10.775 | 110.5 | 0.023 | 68.0 | 0.699 | -22.4 |
| 400 | 0.437 | 225.3 | 8.448 | 101.0 | 0.028 | 72.9 | 0.667 | -24.8 |
| 500 | 0.458 | 210.5 | 6.847 | 92.9 | 0.033 | 76.5 | 0.628 | -28.3 |
| 600 | 0.464 | 203.4 | 5.771 | 87.9 | 0.039 | 80.6 | 0.611 | -30.2 |
| 700 | 0.475 | 196.8 | 4.937 | 83.2 | 0.046 | 82.9 | 0.597 | -33.1 |
| 800 | 0.480 | 191.5 | 4.332 | 79.4 | 0.053 | 84.9 | 0.584 | -35.8 |
| 900 | 0.486 | 187.1 | 3.842 | 75.8 | 0.060 | 86.7 | 0.576 | -38.3 |
| 1000 | 0.487 | 183.0 | 3.458 | 72.6 | 0.068 | 87.8 | 0.565 | -40.9 |
| 1200 | 0.492 | 176.0 | 2.876 | 66.7 | 0.084 | 89.4 | 0.557 | -45.7 |
| 1400 | 0.497 | 170.0 | 2.478 | 61.7 | 0.102 | 90.4 | 0.556 | -49.9 |
| 1600 | 0.500 | 164.4 | 2.179 | 56.9 | 0.121 | 90.6 | 0.561 | -53.9 |
| 1800 | 0.503 | 159.0 | 1.952 | 52.4 | 0.142 | 90.4 | 0.565 | -57.9 |
| 2000 | 0.508 | 153.8 | 1.771 | 48.2 | 0.165 | 89.7 | 0.569 | -61.9 |
| 2200 | 0.510 | 148.4 | 1.625 | 44.3 | 0.189 | 88.6 | 0.579 | -66.1 |
| 2400 | 0.515 | 143.7 | 1.503 | 40.3 | 0.214 | 87.2 | 0.587 | -71.0 |
| 2600 | 0.517 | 138.5 | 1.392 | 36.8 | 0.240 | 85.6 | 0.588 | -75.3 |
| 2800 | 0.520 | 134.0 | 1.311 | 33.8 | 0.270 | 83.8 | 0.600 | -78.9 |
| 3000 | 0.529 | 129.8 | 1.243 | 30.0 | 0.301 | 81.0 | 0.622 | -84.4 |

V_{CE}=5V, I_C=5mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.893 | -11.5 | 9.065 | 164.4 | 0.013 | 88.3 | 0.978 | -8.8 |
| 200 | 0.878 | -17.5 | 8.626 | 152.2 | 0.025 | 80.9 | 0.949 | -17.3 |
| 300 | 0.809 | -31.3 | 8.332 | 143.4 | 0.036 | 79.1 | 0.898 | -24.4 |
| 400 | 0.792 | -36.9 | 7.943 | 137.0 | 0.045 | 75.9 | 0.852 | -31.1 |
| 500 | 0.696 | -54.2 | 7.444 | 126.3 | 0.055 | 72.7 | 0.782 | -38.2 |
| 600 | 0.659 | -62.9 | 6.985 | 119.8 | 0.063 | 71.1 | 0.736 | -42.3 |
| 700 | 0.599 | -74.6 | 6.740 | 112.3 | 0.071 | 69.9 | 0.687 | -47.1 |
| 800 | 0.542 | -84.3 | 6.322 | 105.6 | 0.078 | 69.2 | 0.644 | -51.0 |
| 900 | 0.504 | 268.0 | 5.839 | 100.6 | 0.084 | 68.6 | 0.610 | -54.3 |
| 1000 | 0.455 | 259.8 | 5.465 | 95.2 | 0.090 | 68.4 | 0.573 | -57.1 |
| 1200 | 0.392 | 246.7 | 4.739 | 87.3 | 0.103 | 68.8 | 0.526 | -61.6 |
| 1400 | 0.353 | 236.1 | 4.152 | 81.2 | 0.116 | 69.6 | 0.495 | -64.5 |
| 1600 | 0.323 | 227.1 | 3.696 | 75.9 | 0.129 | 70.3 | 0.475 | -66.7 |
| 1800 | 0.299 | 218.7 | 3.332 | 71.2 | 0.143 | 70.8 | 0.460 | -68.5 |
| 2000 | 0.281 | 210.6 | 3.040 | 66.9 | 0.158 | 71.4 | 0.450 | -70.3 |
| 2200 | 0.263 | 203.0 | 2.809 | 62.9 | 0.174 | 71.7 | 0.447 | -72.2 |
| 2400 | 0.255 | 195.6 | 2.618 | 58.8 | 0.191 | 71.6 | 0.446 | -75.1 |
| 2600 | 0.242 | 188.7 | 2.444 | 55.2 | 0.208 | 71.5 | 0.442 | -77.1 |
| 2800 | 0.239 | 183.0 | 2.320 | 51.9 | 0.228 | 71.4 | 0.449 | -78.4 |
| 3000 | 0.246 | 176.1 | 2.218 | 47.9 | 0.250 | 70.3 | 0.464 | -81.9 |

MCH3007

S Parameters (Common emitter)

V_{CE}=5V, I_C=10mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.792 | -17.6 | 14.870 | 159.5 | 0.013 | 88.0 | 0.957 | -11.5 |
| 200 | 0.754 | -27.7 | 13.544 | 145.4 | 0.022 | 77.9 | 0.892 | -21.2 |
| 300 | 0.642 | -48.6 | 12.776 | 132.5 | 0.030 | 77.7 | 0.815 | -28.1 |
| 400 | 0.601 | -58.2 | 11.567 | 124.3 | 0.037 | 75.8 | 0.751 | -33.7 |
| 500 | 0.489 | -79.8 | 10.460 | 111.9 | 0.045 | 75.0 | 0.677 | -39.6 |
| 600 | 0.452 | 269.8 | 9.468 | 105.4 | 0.053 | 75.3 | 0.632 | -42.7 |
| 700 | 0.410 | 258.3 | 8.253 | 98.9 | 0.060 | 75.7 | 0.592 | -46.4 |
| 800 | 0.380 | 249.3 | 7.358 | 94.0 | 0.067 | 76.0 | 0.556 | -49.3 |
| 900 | 0.359 | 241.6 | 6.641 | 89.8 | 0.075 | 76.4 | 0.530 | -51.8 |
| 1000 | 0.338 | 234.7 | 6.018 | 86.3 | 0.082 | 76.6 | 0.503 | -54.1 |
| 1200 | 0.310 | 222.9 | 5.069 | 80.2 | 0.097 | 77.1 | 0.470 | -57.7 |
| 1400 | 0.294 | 213.1 | 4.384 | 75.2 | 0.112 | 77.4 | 0.450 | -60.0 |
| 1600 | 0.280 | 204.7 | 3.871 | 70.7 | 0.129 | 77.5 | 0.441 | -62.1 |
| 1800 | 0.270 | 196.8 | 3.472 | 66.6 | 0.145 | 77.4 | 0.433 | -63.8 |
| 2000 | 0.262 | 189.2 | 3.157 | 62.8 | 0.162 | 77.1 | 0.429 | -65.6 |
| 2200 | 0.254 | 182.2 | 2.905 | 59.2 | 0.181 | 76.8 | 0.432 | -67.6 |
| 2400 | 0.253 | 176.0 | 2.700 | 55.5 | 0.199 | 75.9 | 0.435 | -70.7 |
| 2600 | 0.246 | 169.6 | 2.514 | 52.1 | 0.218 | 75.2 | 0.435 | -72.9 |
| 2800 | 0.247 | 165.1 | 2.381 | 49.1 | 0.239 | 74.5 | 0.445 | -74.5 |
| 3000 | 0.258 | 159.8 | 2.273 | 45.3 | 0.263 | 72.9 | 0.462 | -78.3 |

V_{CE}=5V, I_C=15mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.691 | -25.3 | 18.098 | 155.5 | 0.011 | 81.7 | 0.936 | -12.7 |
| 200 | 0.628 | -41.7 | 16.001 | 139.7 | 0.020 | 76.6 | 0.847 | -22.0 |
| 300 | 0.505 | -68.7 | 14.151 | 123.7 | 0.027 | 76.2 | 0.766 | -27.6 |
| 400 | 0.452 | -83.3 | 12.511 | 114.0 | 0.033 | 77.5 | 0.706 | -31.7 |
| 500 | 0.394 | 256.4 | 10.390 | 103.8 | 0.040 | 77.5 | 0.640 | -36.6 |
| 600 | 0.376 | 245.9 | 9.124 | 98.0 | 0.047 | 78.9 | 0.604 | -38.8 |
| 700 | 0.360 | 235.9 | 7.856 | 92.7 | 0.054 | 79.7 | 0.573 | -41.9 |
| 800 | 0.350 | 227.5 | 6.939 | 88.5 | 0.062 | 80.6 | 0.545 | -44.5 |
| 900 | 0.342 | 220.8 | 6.231 | 84.9 | 0.069 | 81.0 | 0.526 | -46.7 |
| 1000 | 0.333 | 214.6 | 5.620 | 81.6 | 0.077 | 81.4 | 0.504 | -48.7 |
| 1200 | 0.322 | 204.2 | 4.714 | 76.0 | 0.092 | 82.0 | 0.481 | -52.4 |
| 1400 | 0.318 | 195.8 | 4.071 | 71.3 | 0.109 | 82.3 | 0.469 | -55.0 |
| 1600 | 0.312 | 188.4 | 3.591 | 67.0 | 0.125 | 82.2 | 0.466 | -57.4 |
| 1800 | 0.308 | 181.5 | 3.219 | 62.9 | 0.143 | 82.0 | 0.463 | -59.6 |
| 2000 | 0.307 | 175.0 | 2.925 | 59.1 | 0.162 | 81.6 | 0.463 | -62.0 |
| 2200 | 0.304 | 168.7 | 2.690 | 55.4 | 0.181 | 81.0 | 0.469 | -64.6 |
| 2400 | 0.306 | 163.5 | 2.501 | 51.7 | 0.202 | 80.0 | 0.475 | -68.2 |
| 2600 | 0.302 | 157.8 | 2.327 | 48.3 | 0.222 | 79.1 | 0.477 | -70.9 |
| 2800 | 0.305 | 153.6 | 2.202 | 45.2 | 0.245 | 78.2 | 0.488 | -73.1 |
| 3000 | 0.317 | 149.2 | 2.101 | 41.4 | 0.271 | 76.3 | 0.508 | -77.4 |

MCH3007

S Parameters (Common emitter)

V_{CE}=5V, I_C=20mA

| Freq(MHz) | S11 | ∠S11 | S21 | ∠S21 | S12 | ∠S12 | S22 | ∠S22 |
|-----------|-------|-------|--------|-------|-------|------|-------|-------|
| 100 | 0.591 | -37.1 | 19.539 | 151.2 | 0.010 | 86.0 | 0.904 | -12.7 |
| 200 | 0.508 | -64.2 | 15.394 | 132.6 | 0.017 | 73.2 | 0.808 | -20.0 |
| 300 | 0.425 | 264.1 | 13.138 | 115.7 | 0.023 | 75.0 | 0.740 | -23.8 |
| 400 | 0.396 | 246.9 | 10.561 | 106.1 | 0.028 | 77.4 | 0.696 | -26.6 |
| 500 | 0.393 | 228.4 | 8.791 | 97.4 | 0.034 | 79.7 | 0.648 | -30.4 |
| 600 | 0.393 | 219.4 | 7.452 | 92.2 | 0.041 | 81.8 | 0.625 | -32.3 |
| 700 | 0.398 | 211.1 | 6.426 | 87.4 | 0.047 | 83.9 | 0.605 | -35.1 |
| 800 | 0.400 | 204.4 | 5.644 | 83.5 | 0.054 | 85.1 | 0.586 | -37.6 |
| 900 | 0.403 | 199.0 | 5.020 | 79.9 | 0.062 | 86.4 | 0.574 | -39.9 |
| 1000 | 0.402 | 194.0 | 4.518 | 76.8 | 0.069 | 87.1 | 0.559 | -42.2 |
| 1200 | 0.404 | 185.7 | 3.761 | 71.1 | 0.085 | 88.2 | 0.546 | -46.5 |
| 1400 | 0.408 | 178.9 | 3.240 | 66.2 | 0.102 | 88.9 | 0.541 | -49.9 |
| 1600 | 0.409 | 172.7 | 2.850 | 61.6 | 0.120 | 89.1 | 0.544 | -53.4 |
| 1800 | 0.410 | 166.9 | 2.552 | 57.4 | 0.140 | 88.9 | 0.545 | -56.7 |
| 2000 | 0.414 | 161.3 | 2.316 | 53.3 | 0.161 | 88.2 | 0.548 | -60.1 |
| 2200 | 0.415 | 155.6 | 2.127 | 49.5 | 0.183 | 87.4 | 0.557 | -63.7 |
| 2400 | 0.419 | 150.9 | 1.971 | 45.6 | 0.207 | 86.2 | 0.565 | -68.1 |
| 2600 | 0.420 | 145.6 | 1.830 | 42.1 | 0.230 | 84.9 | 0.567 | -71.8 |
| 2800 | 0.424 | 141.3 | 1.728 | 38.9 | 0.258 | 83.5 | 0.580 | -74.8 |
| 3000 | 0.435 | 137.2 | 1.644 | 35.0 | 0.287 | 81.0 | 0.602 | -79.9 |

V_{CE}=8V, I_C=5mA

| Freq(MHz) | S11 | ∠S11 | S21 | ∠S21 | S12 | ∠S12 | S22 | ∠S22 |
|-----------|-------|-------|-------|-------|-------|------|-------|-------|
| 100 | 0.898 | -11.4 | 9.031 | 164.6 | 0.014 | 81.3 | 0.979 | -8.5 |
| 200 | 0.883 | -17.3 | 8.611 | 152.5 | 0.023 | 80.9 | 0.951 | -16.8 |
| 300 | 0.815 | -31.0 | 8.301 | 143.8 | 0.034 | 78.7 | 0.903 | -23.6 |
| 400 | 0.798 | -36.5 | 7.927 | 137.3 | 0.044 | 76.2 | 0.858 | -30.2 |
| 500 | 0.702 | -53.6 | 7.625 | 126.6 | 0.054 | 72.7 | 0.790 | -37.1 |
| 600 | 0.665 | -62.3 | 6.978 | 120.2 | 0.062 | 71.9 | 0.744 | -41.1 |
| 700 | 0.605 | -73.7 | 6.732 | 112.7 | 0.069 | 70.5 | 0.697 | -45.8 |
| 800 | 0.547 | -83.4 | 6.322 | 106.0 | 0.076 | 69.6 | 0.654 | -49.6 |
| 900 | 0.510 | 269.0 | 5.840 | 100.9 | 0.082 | 69.3 | 0.620 | -52.9 |
| 1000 | 0.460 | 260.8 | 5.471 | 95.5 | 0.089 | 69.3 | 0.584 | -55.5 |
| 1200 | 0.396 | 247.8 | 4.746 | 87.5 | 0.101 | 69.6 | 0.537 | -60.0 |
| 1400 | 0.356 | 237.3 | 4.159 | 81.4 | 0.113 | 70.3 | 0.507 | -62.8 |
| 1600 | 0.325 | 228.3 | 3.705 | 76.0 | 0.127 | 71.1 | 0.488 | -65.1 |
| 1800 | 0.301 | 219.9 | 3.339 | 71.3 | 0.141 | 71.8 | 0.473 | -66.8 |
| 2000 | 0.282 | 211.8 | 3.046 | 67.0 | 0.156 | 72.3 | 0.463 | -68.7 |
| 2200 | 0.264 | 204.3 | 2.814 | 62.9 | 0.172 | 72.7 | 0.461 | -70.6 |
| 2400 | 0.256 | 196.9 | 2.622 | 58.8 | 0.188 | 72.7 | 0.460 | -73.5 |
| 2600 | 0.243 | 189.9 | 2.448 | 55.2 | 0.206 | 72.7 | 0.457 | -75.5 |
| 2800 | 0.239 | 184.2 | 2.323 | 51.9 | 0.226 | 72.6 | 0.464 | -76.9 |
| 3000 | 0.246 | 177.3 | 2.222 | 47.9 | 0.248 | 71.4 | 0.480 | -80.5 |

MCH3007

S Parameters (Common emitter)

V_{CE}=8V, I_C=10mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.804 | -16.7 | 15.064 | 160.0 | 0.010 | 91.9 | 0.962 | -10.7 |
| 200 | 0.769 | -26.5 | 14.343 | 146.1 | 0.021 | 79.2 | 0.899 | -20.5 |
| 300 | 0.657 | -46.8 | 12.917 | 133.2 | 0.030 | 77.6 | 0.825 | -27.2 |
| 400 | 0.617 | -55.8 | 11.712 | 125.2 | 0.037 | 76.1 | 0.762 | -32.7 |
| 500 | 0.500 | -77.3 | 10.577 | 112.7 | 0.044 | 75.4 | 0.689 | -38.6 |
| 600 | 0.461 | -87.5 | 9.195 | 106.1 | 0.052 | 75.9 | 0.645 | -41.6 |
| 700 | 0.416 | 260.9 | 8.345 | 99.5 | 0.059 | 76.1 | 0.605 | -45.2 |
| 800 | 0.385 | 251.9 | 7.445 | 94.5 | 0.066 | 76.6 | 0.569 | -48.2 |
| 900 | 0.363 | 244.1 | 6.716 | 90.3 | 0.073 | 77.0 | 0.543 | -50.6 |
| 1000 | 0.340 | 237.2 | 6.084 | 86.7 | 0.080 | 77.1 | 0.516 | -52.8 |
| 1200 | 0.310 | 225.3 | 5.122 | 80.6 | 0.095 | 77.7 | 0.482 | -56.5 |
| 1400 | 0.293 | 215.4 | 4.430 | 75.5 | 0.111 | 78.0 | 0.462 | -58.8 |
| 1600 | 0.278 | 206.9 | 3.909 | 71.1 | 0.126 | 78.2 | 0.453 | -60.8 |
| 1800 | 0.267 | 198.9 | 3.505 | 66.9 | 0.143 | 78.1 | 0.445 | -62.5 |
| 2000 | 0.259 | 191.3 | 3.187 | 63.1 | 0.160 | 77.9 | 0.441 | -64.4 |
| 2200 | 0.250 | 184.2 | 2.932 | 59.4 | 0.178 | 77.5 | 0.445 | -66.4 |
| 2400 | 0.248 | 177.9 | 2.724 | 55.7 | 0.197 | 76.8 | 0.447 | -69.5 |
| 2600 | 0.241 | 171.4 | 2.536 | 52.4 | 0.215 | 76.1 | 0.448 | -71.7 |
| 2800 | 0.242 | 166.8 | 2.402 | 49.3 | 0.237 | 75.4 | 0.458 | -73.3 |
| 3000 | 0.253 | 161.3 | 2.293 | 45.6 | 0.260 | 73.9 | 0.476 | -77.1 |

V_{CE}=8V, I_C=15mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.714 | -23.1 | 18.714 | 156.7 | 0.012 | 82.8 | 0.944 | -12.2 |
| 200 | 0.657 | -37.9 | 16.515 | 141.0 | 0.019 | 77.5 | 0.861 | -21.6 |
| 300 | 0.531 | -62.8 | 14.794 | 125.3 | 0.026 | 76.8 | 0.780 | -27.3 |
| 400 | 0.473 | -75.9 | 12.583 | 115.8 | 0.033 | 77.8 | 0.720 | -31.6 |
| 500 | 0.401 | 264.1 | 10.957 | 105.3 | 0.040 | 78.3 | 0.652 | -36.6 |
| 600 | 0.377 | 253.6 | 9.432 | 99.4 | 0.047 | 79.4 | 0.614 | -39.0 |
| 700 | 0.356 | 243.3 | 8.297 | 94.0 | 0.054 | 80.2 | 0.582 | -42.1 |
| 800 | 0.341 | 234.5 | 7.333 | 89.7 | 0.062 | 80.8 | 0.552 | -44.8 |
| 900 | 0.331 | 227.5 | 6.576 | 86.0 | 0.069 | 81.2 | 0.531 | -47.0 |
| 1000 | 0.319 | 221.1 | 5.934 | 82.8 | 0.076 | 81.5 | 0.508 | -49.0 |
| 1200 | 0.305 | 210.1 | 4.973 | 77.2 | 0.092 | 81.9 | 0.483 | -52.6 |
| 1400 | 0.298 | 201.2 | 4.291 | 72.5 | 0.108 | 82.1 | 0.469 | -55.0 |
| 1600 | 0.290 | 193.5 | 3.781 | 68.2 | 0.125 | 82.1 | 0.465 | -57.3 |
| 1800 | 0.285 | 186.3 | 3.387 | 64.2 | 0.142 | 81.8 | 0.461 | -59.3 |
| 2000 | 0.282 | 179.4 | 3.078 | 60.4 | 0.160 | 81.4 | 0.460 | -61.5 |
| 2200 | 0.278 | 172.9 | 2.829 | 56.8 | 0.179 | 80.7 | 0.466 | -63.9 |
| 2400 | 0.279 | 167.4 | 2.628 | 53.1 | 0.199 | 79.8 | 0.471 | -67.3 |
| 2600 | 0.275 | 161.5 | 2.445 | 49.8 | 0.219 | 79.0 | 0.472 | -69.9 |
| 2800 | 0.277 | 157.3 | 2.313 | 46.8 | 0.242 | 78.1 | 0.484 | -71.8 |
| 3000 | 0.289 | 152.7 | 2.208 | 43.0 | 0.267 | 76.2 | 0.504 | -76.0 |

MCH3007

S Parameters (Common emitter)

V_{CE}=8V, I_C=20mA

| Freq(MHz) | S ₁₁ | ∠S ₁₁ | S ₂₁ | ∠S ₂₁ | S ₁₂ | ∠S ₁₂ | S ₂₂ | ∠S ₂₂ |
|-----------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
| 100 | 0.625 | -31.7 | 20.496 | 153.2 | 0.010 | 85.3 | 0.924 | -12.4 |
| 200 | 0.547 | -54.4 | 16.242 | 135.3 | 0.018 | 74.6 | 0.832 | -20.6 |
| 300 | 0.441 | -82.8 | 14.433 | 118.7 | 0.023 | 75.1 | 0.757 | -25.0 |
| 400 | 0.396 | 261.2 | 11.734 | 109.0 | 0.029 | 78.6 | 0.708 | -28.2 |
| 500 | 0.371 | 241.9 | 9.955 | 100.1 | 0.035 | 80.3 | 0.652 | -32.3 |
| 600 | 0.363 | 232.1 | 8.478 | 94.7 | 0.042 | 82.4 | 0.623 | -34.3 |
| 700 | 0.360 | 222.8 | 7.373 | 89.9 | 0.049 | 83.6 | 0.599 | -37.1 |
| 800 | 0.357 | 215.2 | 6.487 | 85.9 | 0.056 | 84.8 | 0.576 | -39.6 |
| 900 | 0.356 | 209.3 | 5.797 | 82.4 | 0.064 | 85.5 | 0.561 | -41.8 |
| 1000 | 0.352 | 203.5 | 5.218 | 79.3 | 0.071 | 86.0 | 0.543 | -44.0 |
| 1200 | 0.350 | 194.2 | 4.357 | 73.7 | 0.087 | 86.8 | 0.525 | -47.9 |
| 1400 | 0.350 | 186.7 | 3.757 | 69.0 | 0.103 | 87.1 | 0.518 | -50.9 |
| 1600 | 0.349 | 180.0 | 3.309 | 64.6 | 0.121 | 87.1 | 0.518 | -53.9 |
| 1800 | 0.348 | 173.7 | 2.964 | 60.5 | 0.140 | 86.8 | 0.517 | -56.6 |
| 2000 | 0.350 | 167.7 | 2.691 | 56.6 | 0.159 | 86.3 | 0.519 | -59.6 |
| 2200 | 0.349 | 161.7 | 2.472 | 52.9 | 0.180 | 85.5 | 0.527 | -62.7 |
| 2400 | 0.352 | 156.9 | 2.295 | 49.1 | 0.202 | 84.4 | 0.534 | -66.7 |
| 2600 | 0.351 | 151.4 | 2.132 | 45.7 | 0.224 | 83.2 | 0.536 | -69.9 |
| 2800 | 0.354 | 147.2 | 2.016 | 42.6 | 0.250 | 82.1 | 0.549 | -72.5 |
| 3000 | 0.367 | 143.1 | 1.922 | 38.7 | 0.277 | 79.9 | 0.570 | -77.2 |

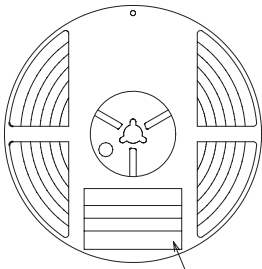
Taping Specification

MCH3007-TL-H

1. Packing Format

| Package Name | Carrier Tape Type | Maximum Number of devices contained (pcs) | | | Packing format | |
|--------------|-------------------|---|-----------|-----------|---|--|
| | | Reel | Inner box | Outer box | Inner BOX (C-1) | Outer BOX (A-7) |
| MCPH3 | MCPH3 | 3,000 | 15,000 | 90,000 | 5 reels contained Dimensions:mm (external) 183×72×185 | 6 inner boxes contained Dimensions:mm (external) 440×195×210 |

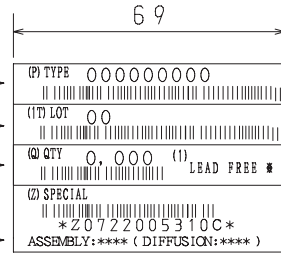
Packing method



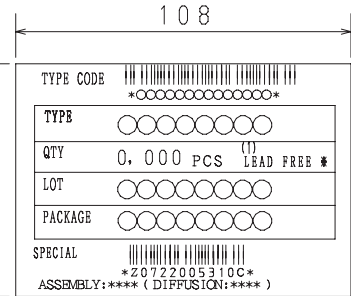
Reel label

Type No.
LOT No.
Quantity
Origin

Reel label, Inner box label (unit:mm)



Outer box label
It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



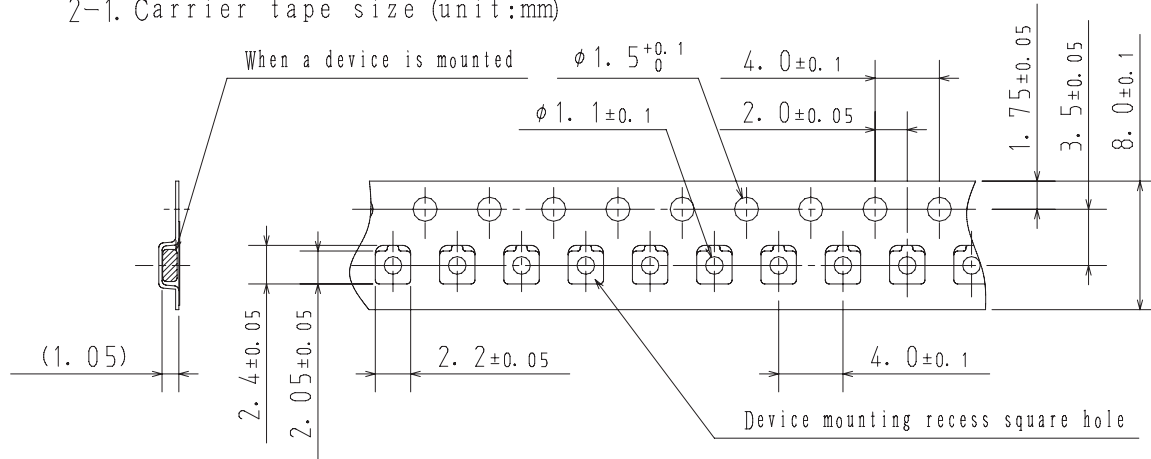
NOTE (1)

The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

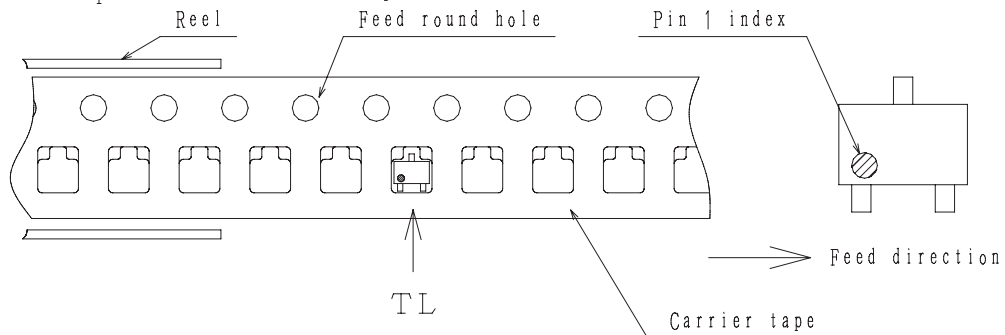
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

2. Taping configuration

2-1. Carrier tape size (unit:mm)



2-2. Device placement direction

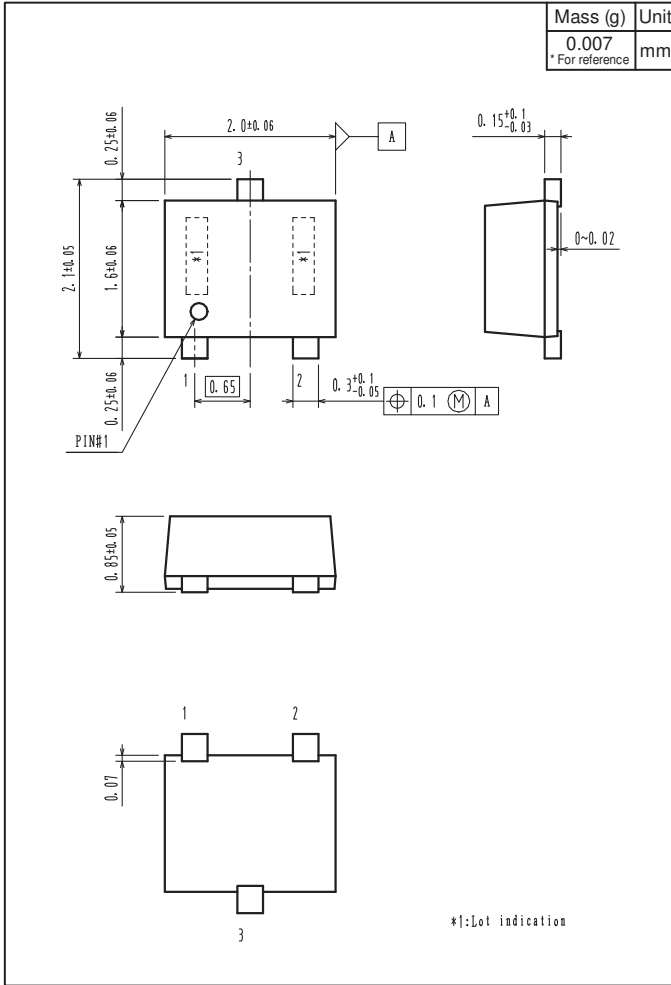


Those with pin 1 index on the feed hole side.....TL

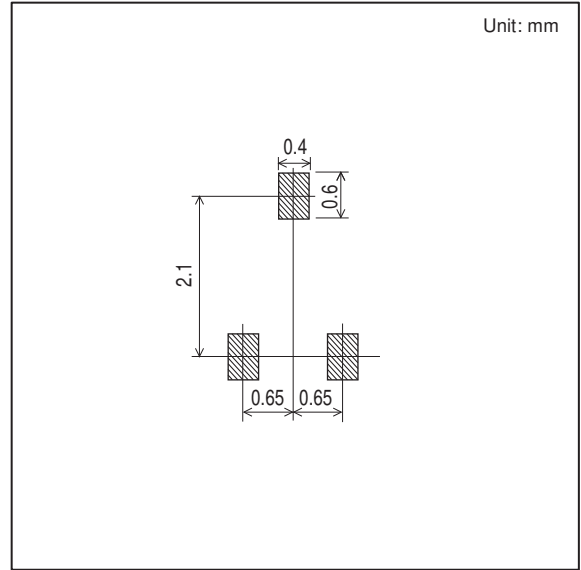
MCH3007

Outline Drawing

MCH3007-TL-H



Land Pattern Example



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