

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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Not recommended  
for new design

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## 2SK2596

### Silicon N-Channel MOS FET UHF Power Amplifier

REJ03G0207-0400

Rev.4.00

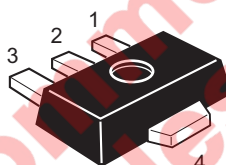
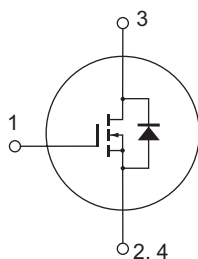
Nov 08, 2007

#### Features

- High power output, High gain, High efficiency  
PG = 12.2 dB, Pout = 1.05 W,  $\eta_D = 45\%$ min. (f = 836.5 MHz)
- Compact package capable of surface mounting

#### Outline

RENESAS package code: PLZZ0004CA-A  
(Package name: UPAK<sup>®</sup>)



1. Gate
2. Source
3. Drain
4. Source

Note: Marking is "BX".

\*UPAK is a trademark of Renesas Technology Corp.

#### Absolute Maximum Ratings

(Ta = 25°C)

| Item                    | Symbol                          | Ratings     | Unit |
|-------------------------|---------------------------------|-------------|------|
| Drain to source voltage | $V_{DS}$                        | 17          | V    |
| Gate to source voltage  | $V_{GS}$                        | ±10         | V    |
| Drain current           | $I_D$                           | 0.4         | A    |
| Drain peak current      | $I_{D(pulse)}$ <sup>Note1</sup> | 1           | A    |
| Channel dissipation     | Pch <sup>Note2</sup>            | 3           | W    |
| Channel temperature     | Tch                             | 150         | °C   |
| Storage temperature     | Tstg                            | -45 to +150 | °C   |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%

2. Value at Tc = 25°C

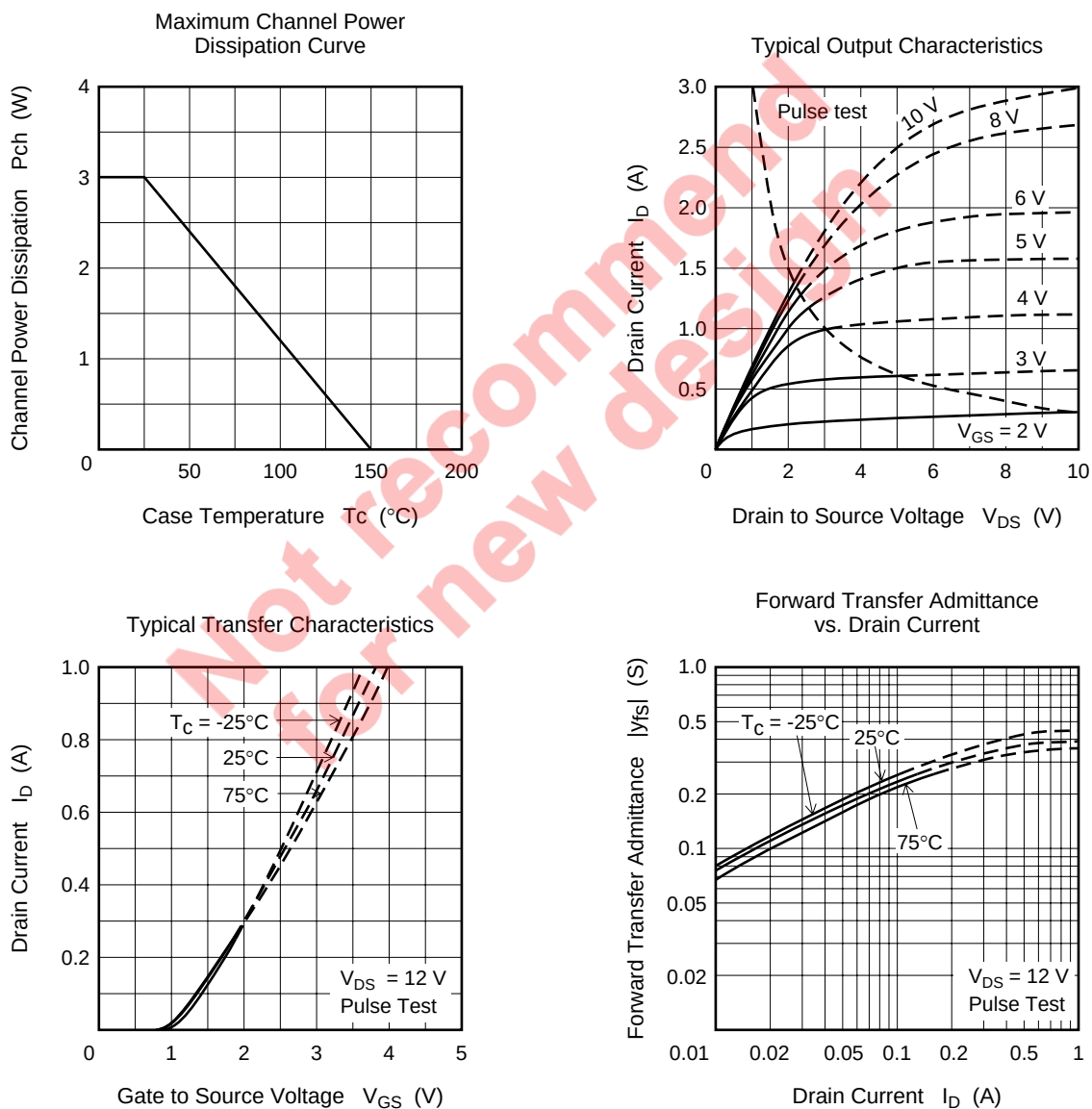
This device is sensitive to electro static discharge. An adequate careful handling procedure is requested.

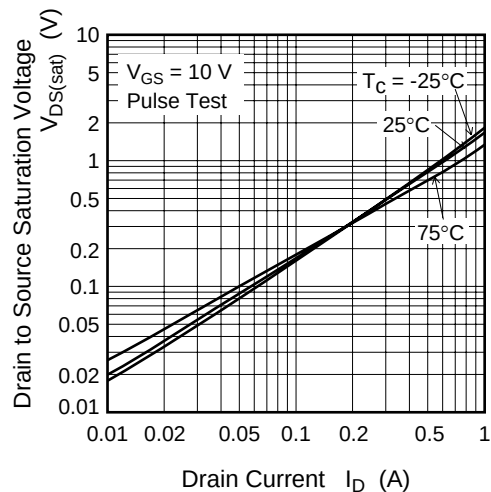
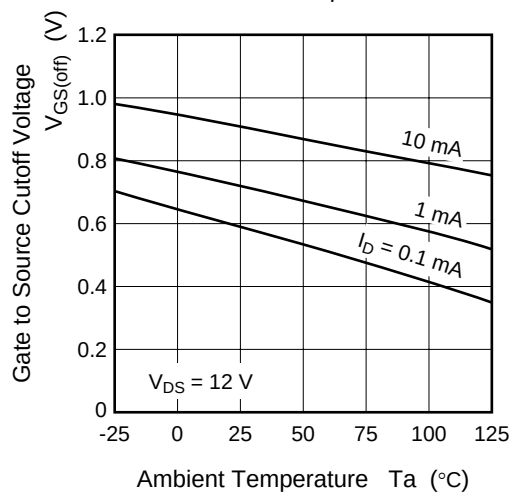
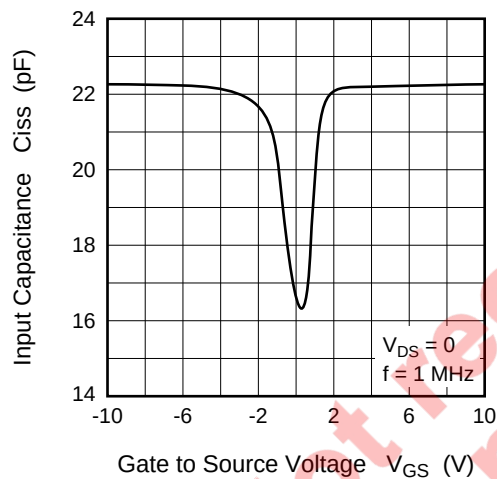
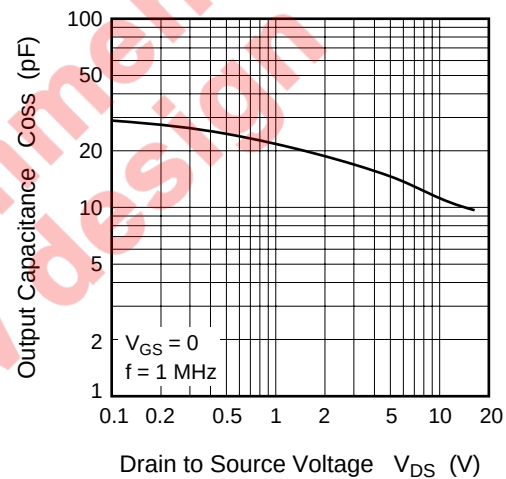
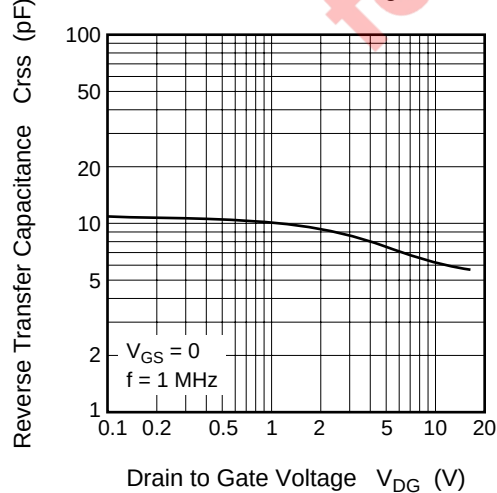
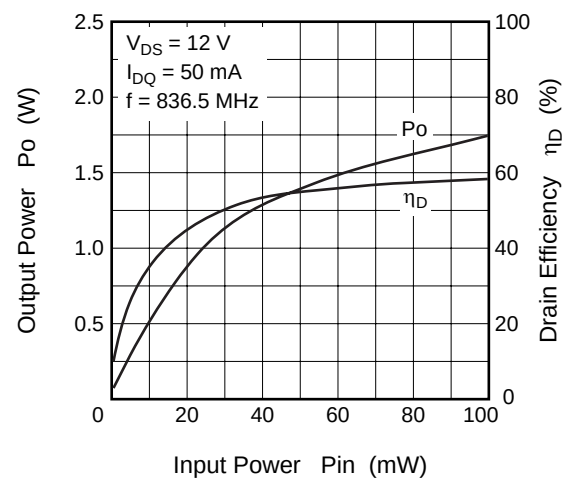
## Electrical Characteristics

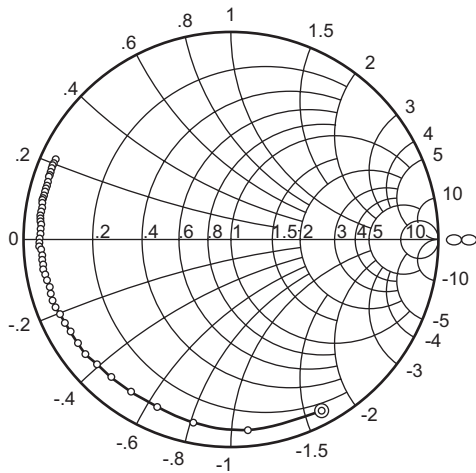
(Ta = 25°C)

| Item                            | Symbol        | Min. | Typ  | Max.      | Unit    | Test Conditions                        |
|---------------------------------|---------------|------|------|-----------|---------|----------------------------------------|
| Zero gate voltage drain current | $I_{DSS}$     | —    | —    | 10        | $\mu A$ | $V_{DS} = 12 V, V_{GS} = 0$            |
| Gate to source leak current     | $I_{GSS}$     | —    | —    | $\pm 5.0$ | $\mu A$ | $V_{GS} = \pm 10 V, V_{DS} = 0$        |
| Gate to source cutoff voltage   | $V_{GS(off)}$ | 0.4  | —    | 1.1       | V       | $V_{DS} = 12 V, I_D = 2 mA$            |
| Input capacitance               | $C_{iss}$     | —    | 22   | —         | pF      | $V_{GS} = 5 V, V_{DS} = 0, f = 1 MHz$  |
| Output capacitance              | $C_{oss}$     | —    | 10.5 | —         | pF      | $V_{DS} = 12 V, V_{GS} = 0, f = 1 MHz$ |
| Output Power                    | $P_{out}$     | 30.2 | 31.5 | —         | dBm     | $V_{DS} = 12 V, I_{DQ} = 50 mA$        |
|                                 |               | 1.05 | 1.4  | —         | W       | $f = 836.5 MHz, P_{in} = 63 mW$        |
| Drain Efficiency                | $\eta_D$      | 45   | 55   | —         | %       |                                        |

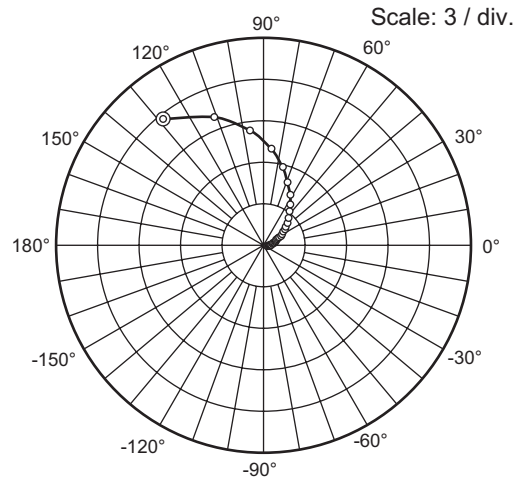
## Main Characteristics



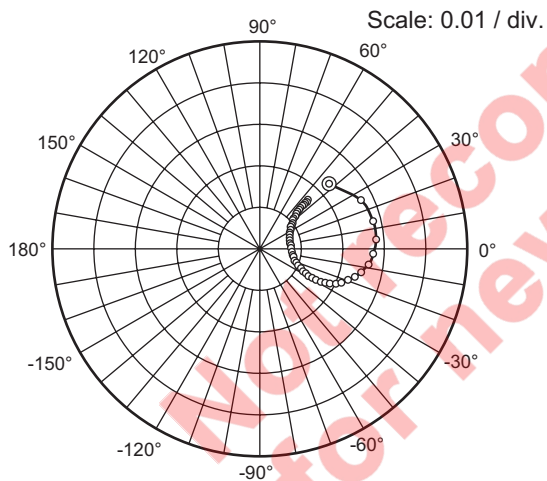
Drain to Source Saturation Voltage  
vs. Drain CurrentGate to Source Cutoff Voltage vs.  
Ambient TemperatureInput Capacitance vs.  
Gate to Source VoltageOutput Capacitance vs.  
Drain to Source VoltageReverse Transfer Capacitance vs.  
Drain to Gate VoltageOutput Power, Drain Efficiency  
vs. Input Power

S<sub>11</sub> Parameter vs. Frequency

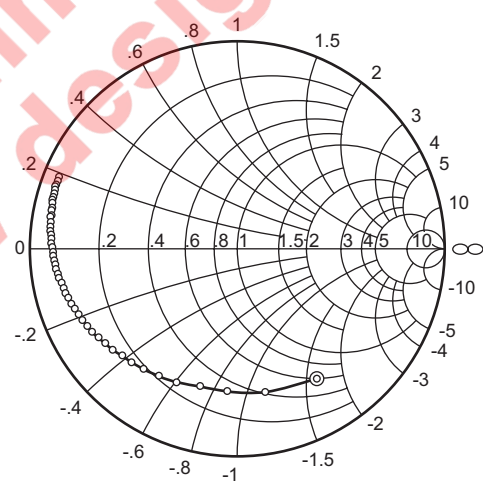
Test condition:  $V_{DS} = 12\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $Z_O = 50\ \Omega$   
100 to 2500 MHz (50 MHz step)

S<sub>21</sub> Parameter vs. Frequency

Test condition:  $V_{DS} = 12\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $Z_O = 50\ \Omega$   
100 to 2500 MHz (50 MHz step)

S<sub>12</sub> Parameter vs. Frequency

Test condition:  $V_{DS} = 12\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $Z_O = 50\ \Omega$   
100 to 2500 MHz (50 MHz step)

S<sub>22</sub> Parameter vs. Frequency

Test condition:  $V_{DS} = 12\text{ V}$ ,  $I_{DQ} = 50\text{ mA}$ ,  $Z_O = 50\ \Omega$   
100 to 2500 MHz (50 MHz step)

## S Parameter

(V<sub>DS</sub> = 3.8 V, I<sub>DQ</sub> = 50 mA, Z<sub>O</sub> = 50 Ω)

| f (MHz) | S11   |           | S21  |           | S12    |           | S22   |           |
|---------|-------|-----------|------|-----------|--------|-----------|-------|-----------|
|         | MAG   | ANG(deg.) | MAG  | ANG(deg.) | MAG    | ANG(deg.) | MAG   | ANG(deg.) |
| 100     | 0.875 | -71.1     | 7.24 | 121.4     | 0.0440 | 28.8      | 0.646 | -97.9     |
| 150     | 0.825 | -95.7     | 6.41 | 100.9     | 0.0474 | 12.2      | 0.662 | -118.6    |
| 200     | 0.807 | -110.8    | 5.28 | 86.8      | 0.0471 | 1.8       | 0.677 | -130.6    |
| 250     | 0.806 | -121.1    | 4.27 | 76.7      | 0.0454 | -6.9      | 0.711 | -139.0    |
| 300     | 0.811 | -129.1    | 3.46 | 68.9      | 0.0440 | -12.7     | 0.731 | -145.0    |
| 350     | 0.824 | -135.7    | 2.85 | 62.4      | 0.0416 | -17.6     | 0.746 | -149.9    |
| 400     | 0.840 | -141.1    | 2.39 | 56.8      | 0.0393 | -21.4     | 0.764 | -153.5    |
| 450     | 0.853 | -145.4    | 2.03 | 52.1      | 0.0374 | -24.9     | 0.774 | -156.9    |
| 500     | 0.860 | -149.1    | 1.75 | 48.1      | 0.0352 | -27.0     | 0.788 | -159.6    |
| 550     | 0.868 | -152.6    | 1.52 | 44.6      | 0.0334 | -29.7     | 0.800 | -162.1    |
| 600     | 0.874 | -155.8    | 1.34 | 41.4      | 0.0316 | -31.1     | 0.808 | -164.1    |
| 650     | 0.883 | -158.6    | 1.19 | 38.5      | 0.0301 | -32.5     | 0.817 | -166.0    |
| 700     | 0.890 | -160.9    | 1.06 | 35.9      | 0.0289 | -33.7     | 0.818 | -167.9    |
| 750     | 0.895 | -163.1    | 0.96 | 33.4      | 0.0273 | -34.7     | 0.827 | -169.6    |
| 800     | 0.895 | -165.1    | 0.87 | 31.0      | 0.0259 | -35.2     | 0.834 | -171.3    |
| 850     | 0.897 | -167.1    | 0.79 | 28.9      | 0.0247 | -36.1     | 0.835 | -172.7    |
| 900     | 0.900 | -169.1    | 0.72 | 26.9      | 0.0233 | -36.8     | 0.839 | -174.1    |
| 950     | 0.904 | -170.8    | 0.67 | 25.1      | 0.0224 | -36.7     | 0.843 | -175.5    |
| 1000    | 0.908 | -172.3    | 0.62 | 23.2      | 0.0214 | -37.0     | 0.849 | -176.8    |
| 1050    | 0.908 | -173.8    | 0.57 | 21.3      | 0.0204 | -36.6     | 0.853 | -178.0    |
| 1100    | 0.909 | -175.3    | 0.53 | 19.4      | 0.0197 | -37.0     | 0.858 | -179.3    |
| 1150    | 0.910 | -176.8    | 0.50 | 17.6      | 0.0187 | -36.6     | 0.858 | 179.5     |
| 1200    | 0.911 | -178.1    | 0.47 | 16.1      | 0.0179 | -35.9     | 0.864 | 178.3     |
| 1250    | 0.915 | -179.3    | 0.44 | 14.6      | 0.0172 | -34.9     | 0.866 | 177.2     |
| 1300    | 0.918 | 179.6     | 0.41 | 13.0      | 0.0165 | -34.9     | 0.870 | 176.2     |
| 1350    | 0.918 | 178.4     | 0.39 | 11.4      | 0.0157 | -33.1     | 0.873 | 175.1     |
| 1400    | 0.915 | 177.1     | 0.37 | 9.8       | 0.0150 | -32.4     | 0.871 | 174.0     |
| 1450    | 0.916 | 175.9     | 0.35 | 8.4       | 0.0144 | -30.6     | 0.874 | 173.1     |
| 1500    | 0.918 | 174.7     | 0.33 | 6.9       | 0.0139 | -29.2     | 0.876 | 172.0     |
| 1550    | 0.919 | 173.6     | 0.32 | 5.6       | 0.0131 | -27.5     | 0.878 | 170.7     |
| 1600    | 0.921 | 172.8     | 0.30 | 4.2       | 0.0128 | -25.5     | 0.883 | 169.8     |
| 1650    | 0.923 | 171.8     | 0.29 | 3.0       | 0.0122 | -23.1     | 0.882 | 169.0     |
| 1700    | 0.923 | 170.8     | 0.27 | 1.6       | 0.0120 | -22.0     | 0.885 | 167.9     |
| 1750    | 0.923 | 169.6     | 0.26 | 0.1       | 0.0119 | -18.9     | 0.887 | 166.9     |
| 1800    | 0.925 | 168.5     | 0.25 | -1.2      | 0.0116 | -16.6     | 0.892 | 165.8     |
| 1850    | 0.926 | 167.6     | 0.24 | -2.6      | 0.0114 | -13.7     | 0.893 | 164.7     |
| 1900    | 0.925 | 166.9     | 0.23 | -3.8      | 0.0111 | -10.7     | 0.893 | 163.5     |
| 1950    | 0.923 | 165.9     | 0.22 | -5.3      | 0.0111 | -7.1      | 0.896 | 163.3     |
| 2000    | 0.923 | 164.9     | 0.21 | -6.4      | 0.0109 | -6.1      | 0.898 | 161.9     |
| 2050    | 0.923 | 163.9     | 0.20 | -7.5      | 0.0110 | -3.0      | 0.898 | 161.0     |
| 2100    | 0.923 | 162.9     | 0.20 | -8.6      | 0.0111 | 0.8       | 0.899 | 160.1     |
| 2150    | 0.924 | 161.9     | 0.19 | -9.9      | 0.0111 | 3.0       | 0.903 | 159.1     |
| 2200    | 0.927 | 160.8     | 0.18 | -11.0     | 0.0115 | 5.6       | 0.901 | 158.6     |
| 2250    | 0.927 | 159.9     | 0.18 | -12.2     | 0.0114 | 7.9       | 0.905 | 157.5     |
| 2300    | 0.927 | 158.9     | 0.17 | -13.1     | 0.0116 | 9.9       | 0.905 | 156.5     |
| 2350    | 0.929 | 157.9     | 0.16 | -14.4     | 0.0120 | 12.4      | 0.908 | 155.6     |
| 2400    | 0.930 | 157.0     | 0.16 | -15.4     | 0.0123 | 13.2      | 0.909 | 155.1     |
| 2450    | 0.931 | 156.2     | 0.15 | -16.4     | 0.0124 | 15.0      | 0.905 | 154.1     |
| 2500    | 0.930 | 155.2     | 0.15 | -17.4     | 0.0130 | 16.2      | 0.903 | 153.2     |



## S Parameter

(V<sub>DS</sub> = 6.0 V, I<sub>DQ</sub> = 50 mA, Z<sub>O</sub> = 50 Ω)

| f (MHz) | S11   |           | S21  |           | S12    |           | S22   |           |
|---------|-------|-----------|------|-----------|--------|-----------|-------|-----------|
|         | MAG   | ANG(deg.) | MAG  | ANG(deg.) | MAG    | ANG(deg.) | MAG   | ANG(deg.) |
| 100     | 0.883 | -68.6     | 9.10 | 123.1     | 0.0371 | 33.6      | 0.675 | -83.2     |
| 150     | 0.851 | -92.2     | 7.85 | 104.4     | 0.0411 | 15.6      | 0.668 | -105.0    |
| 200     | 0.836 | -108.2    | 6.46 | 89.9      | 0.0410 | 4.6       | 0.672 | -118.6    |
| 250     | 0.828 | -119.0    | 5.26 | 79.3      | 0.0405 | -3.2      | 0.699 | -128.4    |
| 300     | 0.829 | -127.4    | 4.28 | 71.1      | 0.0388 | -10.1     | 0.715 | -135.6    |
| 350     | 0.839 | -134.4    | 3.54 | 64.2      | 0.0369 | -15.2     | 0.732 | -141.2    |
| 400     | 0.852 | -139.9    | 2.97 | 58.4      | 0.0352 | -19.6     | 0.751 | -145.8    |
| 450     | 0.863 | -144.3    | 2.53 | 53.4      | 0.0332 | -22.8     | 0.763 | -149.4    |
| 500     | 0.869 | -148.1    | 2.18 | 49.3      | 0.0315 | -25.2     | 0.778 | -152.7    |
| 550     | 0.875 | -151.8    | 1.90 | 45.5      | 0.0299 | -27.6     | 0.787 | -155.6    |
| 600     | 0.880 | -155.0    | 1.68 | 42.2      | 0.0283 | -29.4     | 0.796 | -158.2    |
| 650     | 0.887 | -157.8    | 1.48 | 39.1      | 0.0269 | -31.1     | 0.805 | -160.5    |
| 700     | 0.894 | -160.2    | 1.33 | 36.3      | 0.0255 | -32.4     | 0.811 | -162.6    |
| 750     | 0.897 | -162.4    | 1.19 | 33.6      | 0.0245 | -33.3     | 0.822 | -164.4    |
| 800     | 0.898 | -164.4    | 1.08 | 31.1      | 0.0230 | -34.5     | 0.827 | -166.4    |
| 850     | 0.900 | -166.6    | 0.99 | 28.8      | 0.0218 | -34.7     | 0.828 | -167.9    |
| 900     | 0.902 | -168.5    | 0.90 | 26.8      | 0.0208 | -35.2     | 0.834 | -169.8    |
| 950     | 0.906 | -170.3    | 0.83 | 24.8      | 0.0195 | -35.6     | 0.839 | -171.3    |
| 1000    | 0.910 | -171.8    | 0.77 | 22.7      | 0.0188 | -35.8     | 0.846 | -172.9    |
| 1050    | 0.910 | -173.3    | 0.71 | 20.7      | 0.0178 | -35.5     | 0.849 | -174.3    |
| 1100    | 0.912 | -174.8    | 0.66 | 18.8      | 0.0169 | -34.7     | 0.854 | -175.8    |
| 1150    | 0.911 | -176.3    | 0.62 | 16.9      | 0.0160 | -34.6     | 0.855 | -176.9    |
| 1200    | 0.914 | -177.6    | 0.58 | 15.2      | 0.0153 | -33.8     | 0.861 | -178.2    |
| 1250    | 0.918 | -178.8    | 0.54 | 13.7      | 0.0144 | -32.6     | 0.864 | -179.4    |
| 1300    | 0.920 | -179.9    | 0.51 | 12.1      | 0.0139 | -31.3     | 0.868 | -179.3    |
| 1350    | 0.920 | 178.9     | 0.48 | 10.4      | 0.0133 | -28.6     | 0.871 | 178.3     |
| 1400    | 0.917 | 177.5     | 0.45 | 8.8       | 0.0125 | -28.2     | 0.873 | 177.0     |
| 1450    | 0.918 | 176.2     | 0.43 | 7.2       | 0.0121 | -26.1     | 0.877 | 176.0     |
| 1500    | 0.919 | 175.0     | 0.41 | 5.6       | 0.0116 | -23.4     | 0.877 | 174.7     |
| 1550    | 0.921 | 174.0     | 0.39 | 4.4       | 0.0110 | -21.4     | 0.879 | 173.5     |
| 1600    | 0.923 | 173.1     | 0.37 | 2.9       | 0.0106 | -17.6     | 0.883 | 172.5     |
| 1650    | 0.925 | 172.2     | 0.35 | 1.5       | 0.0103 | -15.3     | 0.886 | 171.5     |
| 1700    | 0.925 | 171.1     | 0.33 | 0.1       | 0.0103 | -12.9     | 0.889 | 170.5     |
| 1750    | 0.925 | 169.9     | 0.32 | -1.5      | 0.0098 | -8.7      | 0.894 | 169.5     |
| 1800    | 0.927 | 168.9     | 0.31 | -2.8      | 0.0100 | -5.4      | 0.897 | 168.4     |
| 1850    | 0.928 | 167.9     | 0.29 | -4.2      | 0.0100 | -1.3      | 0.901 | 167.1     |
| 1900    | 0.926 | 167.3     | 0.28 | -5.5      | 0.0099 | 0.5       | 0.896 | 165.9     |
| 1950    | 0.925 | 166.2     | 0.26 | -7.0      | 0.0100 | 5.7       | 0.897 | 165.5     |
| 2000    | 0.924 | 165.2     | 0.25 | -8.2      | 0.0101 | 8.1       | 0.903 | 164.1     |
| 2050    | 0.925 | 164.2     | 0.24 | -9.3      | 0.0102 | 10.3      | 0.900 | 163.1     |
| 2100    | 0.925 | 163.2     | 0.24 | -10.5     | 0.0103 | 12.8      | 0.904 | 162.0     |
| 2150    | 0.926 | 162.1     | 0.23 | -11.8     | 0.0106 | 15.5      | 0.906 | 161.2     |
| 2200    | 0.929 | 161.1     | 0.22 | -13.0     | 0.0110 | 17.7      | 0.908 | 160.4     |
| 2250    | 0.929 | 160.2     | 0.21 | -14.1     | 0.0114 | 20.0      | 0.904 | 159.5     |
| 2300    | 0.929 | 159.2     | 0.20 | -15.2     | 0.0118 | 22.1      | 0.909 | 158.2     |
| 2350    | 0.931 | 158.2     | 0.20 | -16.4     | 0.0123 | 24.2      | 0.915 | 157.6     |
| 2400    | 0.934 | 157.3     | 0.19 | -17.5     | 0.0126 | 25.3      | 0.910 | 156.8     |
| 2450    | 0.933 | 156.5     | 0.18 | -18.6     | 0.0128 | 26.1      | 0.909 | 155.8     |
| 2500    | 0.932 | 155.5     | 0.18 | -19.7     | 0.0134 | 26.9      | 0.910 | 154.8     |



## S Parameter

(V<sub>DS</sub> = 7.2 V, I<sub>DQ</sub> = 50 mA, Z<sub>O</sub> = 50 Ω)

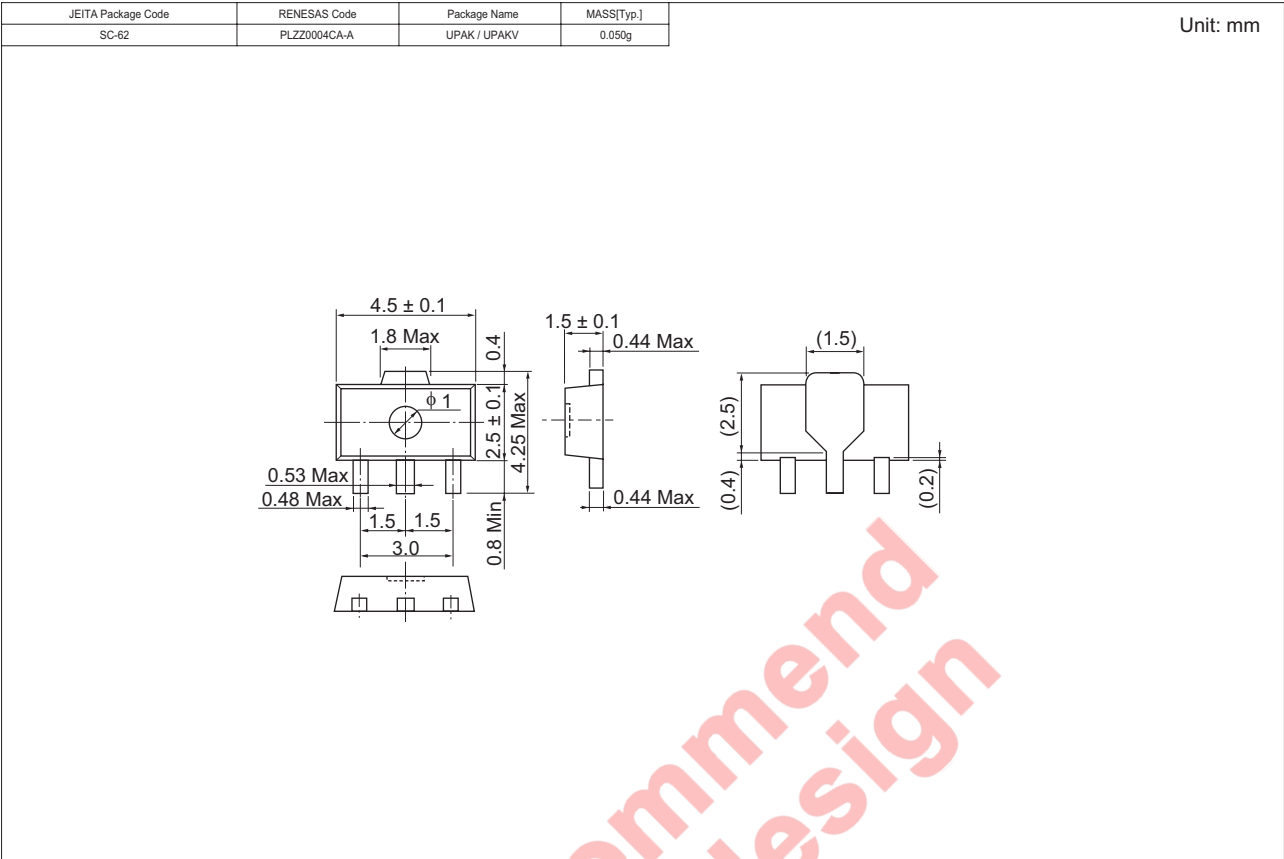
| f (MHz) | S11   |           | S21  |           | S12    |           | S22   |           |
|---------|-------|-----------|------|-----------|--------|-----------|-------|-----------|
|         | MAG   | ANG(deg.) | MAG  | ANG(deg.) | MAG    | ANG(deg.) | MAG   | ANG(deg.) |
| 100     | 0.895 | -67.4     | 9.82 | 124.2     | 0.0332 | 37.0      | 0.689 | -76.7     |
| 150     | 0.866 | -90.5     | 8.41 | 106.1     | 0.0382 | 18.0      | 0.676 | -98.7     |
| 200     | 0.850 | -106.8    | 6.97 | 91.5      | 0.0385 | 6.6       | 0.673 | -112.6    |
| 250     | 0.842 | -117.9    | 5.71 | 80.7      | 0.0382 | -1.9      | 0.697 | -123.1    |
| 300     | 0.840 | -126.6    | 4.66 | 72.3      | 0.0362 | -8.4      | 0.715 | -130.8    |
| 350     | 0.847 | -133.6    | 3.87 | 65.3      | 0.0348 | -13.8     | 0.728 | -136.8    |
| 400     | 0.858 | -139.3    | 3.25 | 59.2      | 0.0328 | -17.8     | 0.746 | -141.6    |
| 450     | 0.869 | -143.8    | 2.77 | 54.2      | 0.0313 | -21.7     | 0.760 | -145.7    |
| 500     | 0.874 | -147.7    | 2.40 | 49.8      | 0.0298 | -24.2     | 0.772 | -149.4    |
| 550     | 0.879 | -151.3    | 2.09 | 46.0      | 0.0282 | -26.4     | 0.782 | -152.4    |
| 600     | 0.884 | -154.6    | 1.84 | 42.6      | 0.0267 | -28.9     | 0.793 | -155.1    |
| 650     | 0.891 | -157.5    | 1.63 | 39.4      | 0.0253 | -30.6     | 0.802 | -157.7    |
| 700     | 0.896 | -159.9    | 1.46 | 36.5      | 0.0241 | -31.3     | 0.810 | -159.6    |
| 750     | 0.899 | -162.1    | 1.31 | 33.7      | 0.0225 | -32.9     | 0.816 | -162.1    |
| 800     | 0.900 | -164.1    | 1.19 | 31.1      | 0.0215 | -33.2     | 0.822 | -163.9    |
| 850     | 0.901 | -166.3    | 1.08 | 28.8      | 0.0205 | -34.3     | 0.827 | -165.5    |
| 900     | 0.904 | -168.3    | 0.99 | 26.6      | 0.0191 | -34.5     | 0.834 | -167.5    |
| 950     | 0.908 | -170.0    | 0.91 | 24.5      | 0.0183 | -34.5     | 0.839 | -169.1    |
| 1000    | 0.912 | -171.6    | 0.84 | 22.5      | 0.0173 | -34.5     | 0.844 | -170.6    |
| 1050    | 0.912 | -173.0    | 0.78 | 20.4      | 0.0165 | -34.1     | 0.851 | -172.3    |
| 1100    | 0.913 | -174.6    | 0.72 | 18.3      | 0.0155 | -33.9     | 0.854 | -173.8    |
| 1150    | 0.913 | -176.0    | 0.68 | 16.5      | 0.0146 | -33.2     | 0.857 | -175.2    |
| 1200    | 0.915 | -177.4    | 0.63 | 14.7      | 0.0139 | -32.0     | 0.862 | -176.4    |
| 1250    | 0.919 | -178.6    | 0.59 | 13.1      | 0.0132 | -30.1     | 0.866 | -177.8    |
| 1300    | 0.921 | -179.7    | 0.56 | 11.5      | 0.0126 | -28.9     | 0.869 | -178.9    |
| 1350    | 0.921 | 179.1     | 0.53 | 9.7       | 0.0119 | -25.8     | 0.873 | 179.8     |
| 1400    | 0.918 | 177.7     | 0.49 | 8.1       | 0.0113 | -23.4     | 0.876 | 178.5     |
| 1450    | 0.919 | 176.4     | 0.47 | 6.4       | 0.0108 | -22.4     | 0.880 | 177.5     |
| 1500    | 0.920 | 175.3     | 0.44 | 4.9       | 0.0102 | -19.1     | 0.878 | 176.3     |
| 1550    | 0.922 | 174.1     | 0.42 | 3.5       | 0.0101 | -15.1     | 0.881 | 175.0     |
| 1600    | 0.923 | 173.3     | 0.40 | 2.0       | 0.0097 | -12.4     | 0.885 | 173.8     |
| 1650    | 0.926 | 172.3     | 0.38 | 0.7       | 0.0093 | -8.8      | 0.886 | 172.9     |
| 1700    | 0.927 | 171.3     | 0.36 | -0.8      | 0.0093 | -5.0      | 0.890 | 171.7     |
| 1750    | 0.926 | 170.1     | 0.35 | -2.3      | 0.0094 | -1.7      | 0.894 | 170.7     |
| 1800    | 0.928 | 169.1     | 0.33 | -3.8      | 0.0091 | 1.6       | 0.897 | 169.3     |
| 1850    | 0.929 | 168.1     | 0.32 | -5.2      | 0.0093 | 6.0       | 0.898 | 168.3     |
| 1900    | 0.928 | 167.4     | 0.30 | -6.5      | 0.0095 | 8.8       | 0.900 | 166.9     |
| 1950    | 0.925 | 166.3     | 0.29 | -8.1      | 0.0099 | 14.4      | 0.899 | 166.6     |
| 2000    | 0.926 | 165.3     | 0.27 | -9.2      | 0.0100 | 15.8      | 0.904 | 165.1     |
| 2050    | 0.926 | 164.3     | 0.26 | -10.4     | 0.0102 | 18.8      | 0.904 | 164.2     |
| 2100    | 0.926 | 163.3     | 0.25 | -11.6     | 0.0104 | 20.4      | 0.907 | 162.9     |
| 2150    | 0.928 | 162.2     | 0.24 | -12.9     | 0.0108 | 23.0      | 0.908 | 162.1     |
| 2200    | 0.929 | 161.2     | 0.24 | -14.1     | 0.0114 | 25.2      | 0.912 | 161.6     |
| 2250    | 0.930 | 160.3     | 0.23 | -15.3     | 0.0114 | 26.2      | 0.909 | 160.4     |
| 2300    | 0.930 | 159.3     | 0.22 | -16.4     | 0.0121 | 27.4      | 0.913 | 159.2     |
| 2350    | 0.933 | 158.2     | 0.21 | -17.6     | 0.0124 | 28.9      | 0.917 | 158.4     |
| 2400    | 0.935 | 157.4     | 0.20 | -18.8     | 0.0131 | 29.6      | 0.911 | 157.6     |
| 2450    | 0.934 | 156.6     | 0.20 | -19.7     | 0.0133 | 31.0      | 0.912 | 156.9     |
| 2500    | 0.934 | 155.6     | 0.19 | -20.9     | 0.0134 | 31.5      | 0.912 | 155.8     |

## S Parameter

(V<sub>DS</sub> = 12 V, I<sub>DQ</sub> = 50 mA, Z<sub>O</sub> = 50 Ω)

| f (MHz) | S11   |           | S21   |           | S12    |           | S22   |           |
|---------|-------|-----------|-------|-----------|--------|-----------|-------|-----------|
|         | MAG   | ANG(deg.) | MAG   | ANG(deg.) | MAG    | ANG(deg.) | MAG   | ANG(deg.) |
| 100     | 0.932 | -62.1     | 11.71 | 128.4     | 0.0228 | 42.3      | 0.735 | -59.0     |
| 150     | 0.921 | -85.1     | 9.96  | 111.2     | 0.0270 | 25.0      | 0.709 | -79.5     |
| 200     | 0.898 | -101.9    | 8.40  | 96.8      | 0.0281 | 13.2      | 0.691 | -94.0     |
| 250     | 0.882 | -114.0    | 7.04  | 85.0      | 0.0282 | 4.1       | 0.694 | -105.3    |
| 300     | 0.877 | -123.5    | 5.80  | 76.1      | 0.0275 | -3.0      | 0.714 | -114.4    |
| 350     | 0.879 | -131.1    | 4.86  | 68.7      | 0.0265 | -8.9      | 0.723 | -121.6    |
| 400     | 0.884 | -137.2    | 4.11  | 62.1      | 0.0252 | -13.4     | 0.738 | -127.7    |
| 450     | 0.892 | -141.9    | 3.53  | 56.6      | 0.0239 | -17.1     | 0.753 | -132.7    |
| 500     | 0.893 | -146.0    | 3.06  | 52.0      | 0.0228 | -20.2     | 0.765 | -137.0    |
| 550     | 0.893 | -150.2    | 2.68  | 47.7      | 0.0215 | -23.0     | 0.776 | -140.9    |
| 600     | 0.895 | -153.4    | 2.37  | 43.7      | 0.0203 | -25.1     | 0.788 | -144.3    |
| 650     | 0.900 | -156.4    | 2.10  | 40.3      | 0.0191 | -27.0     | 0.799 | -147.3    |
| 700     | 0.907 | -158.8    | 1.88  | 37.0      | 0.0179 | -27.9     | 0.808 | -150.1    |
| 750     | 0.909 | -161.1    | 1.70  | 33.9      | 0.0168 | -29.4     | 0.816 | -152.7    |
| 800     | 0.909 | -163.2    | 1.53  | 30.9      | 0.0157 | -30.1     | 0.825 | -155.1    |
| 850     | 0.906 | -165.4    | 1.40  | 28.3      | 0.0147 | -30.2     | 0.831 | -157.3    |
| 900     | 0.909 | -167.5    | 1.28  | 25.8      | 0.0136 | -30.2     | 0.837 | -159.5    |
| 950     | 0.912 | -169.4    | 1.18  | 23.3      | 0.0127 | -29.4     | 0.845 | -161.5    |
| 1000    | 0.917 | -170.9    | 1.08  | 21.1      | 0.0119 | -28.5     | 0.851 | -163.5    |
| 1050    | 0.915 | -172.3    | 1.00  | 18.9      | 0.0111 | -26.8     | 0.857 | -165.3    |
| 1100    | 0.916 | -173.9    | 0.93  | 16.5      | 0.0103 | -25.1     | 0.862 | -167.1    |
| 1150    | 0.916 | -175.3    | 0.87  | 14.3      | 0.0096 | -22.8     | 0.866 | -168.8    |
| 1200    | 0.917 | -177.0    | 0.81  | 12.4      | 0.0090 | -19.8     | 0.871 | -170.4    |
| 1250    | 0.923 | -178.0    | 0.75  | 10.8      | 0.0085 | -15.8     | 0.876 | -171.9    |
| 1300    | 0.925 | -179.3    | 0.71  | 8.8       | 0.0080 | -11.9     | 0.880 | -173.4    |
| 1350    | 0.923 | 179.7     | 0.67  | 7.0       | 0.0078 | -7.0      | 0.883 | -174.8    |
| 1400    | 0.921 | 178.2     | 0.62  | 5.2       | 0.0074 | -1.8      | 0.886 | -176.2    |
| 1450    | 0.920 | 176.8     | 0.59  | 3.4       | 0.0074 | 3.6       | 0.889 | -177.6    |
| 1500    | 0.920 | 175.5     | 0.56  | 1.9       | 0.0074 | 8.5       | 0.890 | -178.9    |
| 1550    | 0.923 | 174.5     | 0.52  | 0.2       | 0.0075 | 13.5      | 0.893 | 179.7     |
| 1600    | 0.927 | 173.7     | 0.50  | -1.4      | 0.0076 | 18.0      | 0.897 | 178.4     |
| 1650    | 0.928 | 172.7     | 0.47  | -2.8      | 0.0079 | 23.3      | 0.899 | 177.2     |
| 1700    | 0.926 | 171.5     | 0.45  | -4.5      | 0.0082 | 26.4      | 0.902 | 175.9     |
| 1750    | 0.926 | 170.3     | 0.43  | -5.9      | 0.0086 | 29.8      | 0.905 | 174.7     |
| 1800    | 0.927 | 169.1     | 0.41  | -7.5      | 0.0090 | 33.1      | 0.910 | 173.5     |
| 1850    | 0.929 | 168.2     | 0.39  | -9.0      | 0.0095 | 35.5      | 0.912 | 172.2     |
| 1900    | 0.927 | 167.5     | 0.38  | -10.4     | 0.0100 | 37.1      | 0.913 | 170.8     |
| 1950    | 0.927 | 166.6     | 0.36  | -12.0     | 0.0105 | 40.0      | 0.911 | 170.2     |
| 2000    | 0.928 | 165.4     | 0.34  | -13.4     | 0.0109 | 41.0      | 0.917 | 168.6     |
| 2050    | 0.927 | 164.5     | 0.33  | -14.6     | 0.0115 | 41.8      | 0.916 | 167.6     |
| 2100    | 0.924 | 163.5     | 0.32  | -15.9     | 0.0121 | 42.8      | 0.918 | 166.4     |
| 2150    | 0.925 | 162.4     | 0.30  | -17.2     | 0.0126 | 43.1      | 0.921 | 165.3     |
| 2200    | 0.930 | 161.1     | 0.29  | -18.3     | 0.0132 | 44.0      | 0.922 | 164.6     |
| 2250    | 0.928 | 160.4     | 0.28  | -19.8     | 0.0137 | 44.4      | 0.921 | 163.4     |
| 2300    | 0.929 | 159.3     | 0.26  | -20.9     | 0.0142 | 44.7      | 0.924 | 162.3     |
| 2350    | 0.931 | 158.3     | 0.26  | -22.1     | 0.0148 | 44.5      | 0.927 | 161.4     |
| 2400    | 0.932 | 157.3     | 0.25  | -23.4     | 0.0153 | 44.4      | 0.926 | 160.6     |
| 2450    | 0.931 | 156.6     | 0.24  | -24.5     | 0.0158 | 44.6      | 0.924 | 159.4     |
| 2500    | 0.930 | 155.6     | 0.23  | -25.7     | 0.0163 | 44.4      | 0.925 | 158.4     |

Package Dimensions



Ordering Information

| Part Name     | Quantity  | Shipping Container                      |
|---------------|-----------|-----------------------------------------|
| 2SK2596BXTL-E | 1000 pcs. | $\phi$ 178 mm Reel, 12 mm Emboss taping |

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1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632  
Tel: <65> 6213-0200, Fax: <65> 6278-8001

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**Renesas Technology Malaysia Sdn. Bhd**  
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