

# SOT23 NPN SILICON PLANAR SMALL SIGNAL TRANSISTORS

ISSUE 2 - JULY 1995

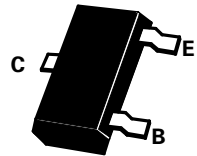


## FMMT5209 FMMT5210

PARTMARKING DETAILS:

FMMT5209 - 2Q

FMMT5210 - 2R



SOT23

### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                               | SYMBOL         | FMMT5209    | FMMT5210 | UNIT |
|-----------------------------------------|----------------|-------------|----------|------|
| Collector-Base Voltage                  | $V_{CBO}$      | 50          |          | V    |
| Collector-Emitter Voltage               | $V_{CEO}$      | 50          |          | V    |
| Emitter-Base Voltage                    | $V_{EBO}$      | 4.5         |          | V    |
| Continuous Collector Current            | $I_C$          | 50          |          | mA   |
| Power Dissipation                       | $P_{tot}$      | 330         |          | mW   |
| Operating and Storage Temperature Range | $T_j; T_{stg}$ | -55 TO +150 |          | °C   |

### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| PARAMETER                             | SYMBOL        | FMMT5209 |      | FMMT5210 |      | UNIT | CONDITIONS.                                                                                                 |
|---------------------------------------|---------------|----------|------|----------|------|------|-------------------------------------------------------------------------------------------------------------|
|                                       |               | MIN.     | MAX. | MIN.     | MAX. |      |                                                                                                             |
| Collector-Base Cut-Off Current        | $I_{CBO}$     |          | 50   |          | 50   | nA   | $V_{CB}=35\text{V}, I_E=0$                                                                                  |
| Emitter-Base Cut-Off Current          | $I_{EBO}$     |          | 50   |          | 50   | nA   | $V_{EB}=3\text{V}, I_C=0$                                                                                   |
| Collector-Emitter Saturation Voltage  | $V_{CE(sat)}$ |          | 700  |          | 700  | mV   | $I_C=10\text{mA}, I_B=1\text{mA}$                                                                           |
| Base-Emitter ON Voltage               | $V_{BE(on)}$  |          | 850  |          | 850  | mV   | $I_C=1\text{mA}, V_{CE}=5\text{V}$                                                                          |
| Static Forward Current Transfer Ratio | $h_{FE}$      | 100      | 300  | 200      | 600  |      | $I_C=100\mu\text{A}, V_{CE}=5\text{V}$                                                                      |
|                                       |               | 150      |      | 250      |      |      | $I_C=1\text{mA}, V_{CE}=5\text{V}$                                                                          |
|                                       |               | 150      |      | 250      |      |      | $I_C=10\text{mA}, V_{CE}=5\text{V}^*$                                                                       |
| Transition Frequency                  | $f_T$         | 30       |      | 30       |      | MHz  | $I_C=0.5\text{mA}, V_{CE}=5\text{V}, f=20\text{MHz}$                                                        |
| Small Signal Current Transfer Ratio   | $h_{fe}$      | 150      | 600  | 250      | 900  | MHz  | $I_C=1\text{mA}, V_{CE}=5\text{V}, f=1\text{KHz}$                                                           |
| Noise Figure                          | N             |          | 3    |          | 2    | dB   | $I_C=200\mu\text{A}, V_{CE}=5\text{V}, R_g=2\text{K}\Omega, f=30\text{Hz}$ to $15\text{KHz}$ at -3dB points |
|                                       |               |          | 4    |          | 3    | dB   | $I_C=200\mu\text{A}, V_{CE}=5\text{V}, R_g=2\text{K}\Omega, f=1\text{KHz}$ to $\Delta f=200\text{Hz}$       |
| Output Capacitance                    | $C_{obo}$     |          | 4    |          | 4    | pF   | $V_{CB}=5\text{V}, I_E=0, f=140\text{KHz}$                                                                  |