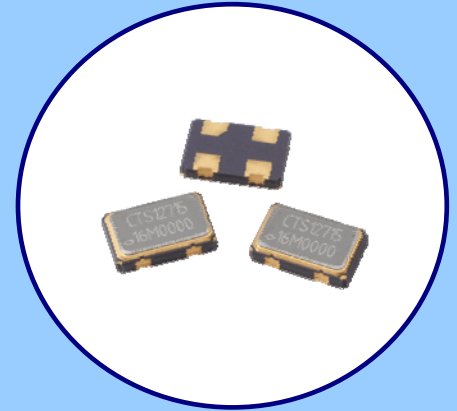


### FEATURES

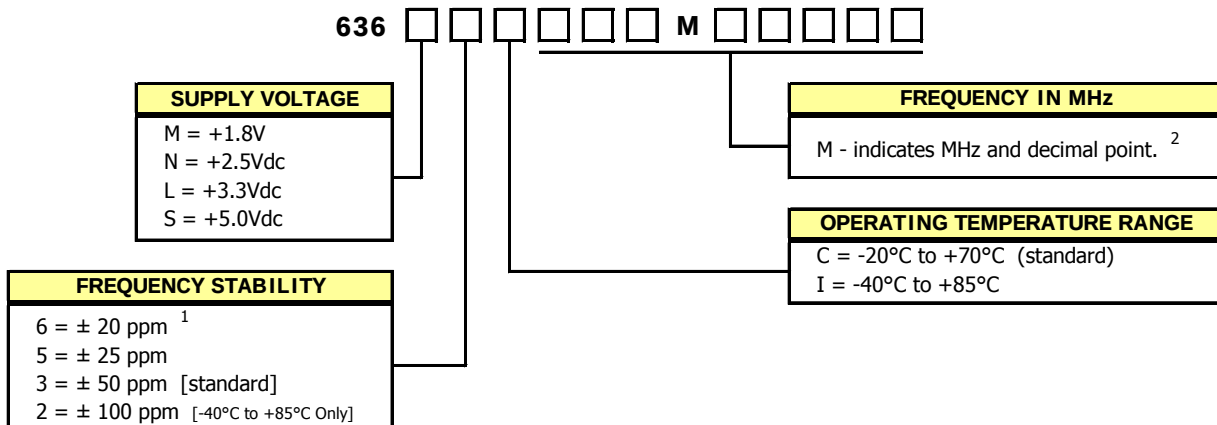
- Standard 5.0mm x 3.2mm 4-Pad Surface Mount Package
- HCMOS/TTL Compatible Output
- Fundamental and 3<sup>rd</sup> Overtone Crystal Designs
- Frequency Range 1 – 160 MHz
- Frequency Stability  $\pm 50$  ppm Standard,  $\pm 25$  ppm and  $\pm 20$  ppm Available
- Operating Voltages +1.8Vdc, +2.5Vdc, +3.3Vdc or +5.0Vdc
- Operating Temperature to -40°C to +85°C
- Output Enable Standard
- Tape & Reel Packaging Available
- **RoHS/Green Compliant (6/6)**



### APPLICATIONS

Model 636 is ideal for applications; such as digital video, networking equipment, broadband access, Ethernet/Gigabit Ethernet, microprocessors/DSP/FPGA, storage area networks, computers and peripherals, cameras and other portable devices to name a few.

### ORDERING INFORMATION



1] 6I Stability/Temperature combination is not available.

2] Frequency is recorded with three leading significant digits before the 'M' and 5 significant digits after the 'M' (including zeros).

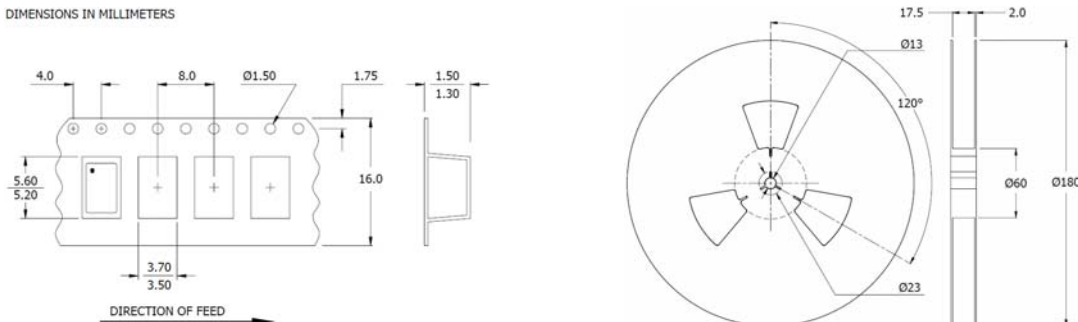
[Ex. XXXXXXXX, (0004M00000 (014M31818) (125M00000)]

**Not all performance combinations and frequencies may be available.  
Contact your local CTS Representative or CTS Customer Service for availability.**

### PACKAGING INFORMATION

Device quantity is 3,000 pieces maximum per reel.

DIMENSIONS IN MILLIMETERS



**ELECTRICAL CHARACTERISTICS**

| ELECTRICAL PARAMETERS | PARAMETER                                                                | SYMBOL            | CONDITIONS                                                                                                                                         | MIN                                                                                                               | TYP                            | MAX                          | UNIT     |                                    |    |     |    |
|-----------------------|--------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------|----------|------------------------------------|----|-----|----|
|                       | Maximum Supply Voltage                                                   | V <sub>CC</sub>   | -                                                                                                                                                  | -0.5                                                                                                              | -                              | 7.0                          | V        |                                    |    |     |    |
|                       | Storage Temperature                                                      | T <sub>STG</sub>  | -                                                                                                                                                  | -55                                                                                                               | -                              | 125                          | °C       |                                    |    |     |    |
|                       | Frequency Range                                                          | f <sub>0</sub>    | -                                                                                                                                                  | 1.0                                                                                                               | -                              | 160                          | MHz      |                                    |    |     |    |
|                       | Frequency Stability<br>[See Note 1 and Ordering Information]             | Δf/f <sub>0</sub> | -                                                                                                                                                  | -                                                                                                                 | -                              | 20,25, 50 or 100             | ± ppm    |                                    |    |     |    |
|                       | Aging                                                                    | Δf/f <sub>0</sub> | -                                                                                                                                                  | -                                                                                                                 | -                              | 3                            | ± ppm/yr |                                    |    |     |    |
|                       | Operating Temperature<br>Commercial<br>Industrial                        | T <sub>A</sub>    | -                                                                                                                                                  | -20<br>-40                                                                                                        | 25                             | 70<br>85                     | °C       |                                    |    |     |    |
|                       | Supply Voltage<br>Model 636M<br>Model 636N<br>Model 636L<br>Model 636S   | V <sub>CC</sub>   | ± 10 %                                                                                                                                             | 1.62<br>2.25<br>2.97<br>4.50                                                                                      | 1.8<br>2.5<br>3.3<br>5.0       | 1.98<br>2.75<br>3.63<br>5.50 | V        |                                    |    |     |    |
|                       | Supply Current<br>Model 636M<br>[+1.8V]                                  | I <sub>CC</sub>   | C <sub>L</sub> = 15pF<br>1.0 MHz to 34.999 MHz<br>35 MHz to 60 MHz<br>60.001 MHz to 99.999 MHz<br>100 MHz to 106.250 MHz<br>106.251 MHz to 160 MHz | -<br>-<br>-<br>-<br>-<br>-                                                                                        | -<br>-<br>-<br>-<br>-<br>-     | 8<br>15<br>25<br>35<br>35    | mA       |                                    |    |     |    |
|                       | Model 636N<br>[+2.5V]                                                    |                   | 1.0 MHz to 34.999 MHz<br>35 MHz to 60 MHz<br>60.001 MHz to 99.999 MHz<br>100 MHz to 106.250 MHz<br>106.251 MHz to 160 MHz                          | -<br>-<br>-<br>-<br>-                                                                                             | -<br>-<br>-<br>-<br>-          | 10<br>20<br>30<br>40<br>40   |          |                                    |    |     |    |
|                       | Model 636L<br>[+3.3V]                                                    |                   | 1.0 MHz to 34.999 MHz<br>35 MHz to 60 MHz<br>60.001 MHz to 99.999 MHz<br>100 MHz to 106.250 MHz<br>106.251 MHz to 160 MHz                          | -<br>-<br>-<br>-<br>-                                                                                             | -<br>-<br>-<br>-<br>-          | 16<br>25<br>40<br>50<br>50   |          |                                    |    |     |    |
|                       | Model 636S<br>[+5.0]                                                     |                   | 1.0 MHz to 34.999 MHz<br>35 MHz to 60 MHz<br>60.001 MHz to 99.999 MHz<br>100 MHz to 106.250 MHz                                                    | -<br>-<br>-<br>-                                                                                                  | -<br>-<br>-<br>-               | 25<br>50<br>60<br>80         |          |                                    |    |     |    |
|                       | Output Load<br>Model 636M                                                |                   | C <sub>L</sub>                                                                                                                                     | 1.0 MHz to 160 MHz                                                                                                | -                              | -                            |          | 15                                 | pF |     |    |
|                       | Model 636N & 636L                                                        |                   |                                                                                                                                                    | 1.0 MHz to 50 MHz<br>50.001 MHz to 160 MHz                                                                        | -                              | -                            |          | 30<br>15                           |    |     |    |
|                       | Model 636S                                                               |                   |                                                                                                                                                    | 1.0 MHz to 50 MHz<br>50.001 MHz to 80 MHz<br>80.001 MHz to 106.250 MHz                                            | -                              | -                            |          | 50<br>30<br>15                     |    |     |    |
|                       | Output Voltage Levels<br>Logic '1' Level<br>Logic '0' Level              |                   | V <sub>OH</sub><br>V <sub>OL</sub>                                                                                                                 | CMOS Load<br>CMOS Load                                                                                            | 90%V <sub>CC</sub><br>-        | -<br>-                       |          | -<br>10%V <sub>CC</sub>            | V  |     |    |
|                       | Output Current<br>Logic '1' Level (M,N,L,S)<br>Logic '0' Level (M,N,L,S) |                   | I <sub>OH</sub><br>I <sub>OL</sub>                                                                                                                 | V <sub>OH</sub> = 90%V <sub>CC</sub><br>V <sub>OL</sub> = 10%V <sub>CC</sub>                                      | -<br>-                         | -<br>-                       |          | -2, -4, -8, -16<br>+2, +4, +8, +16 | mA |     |    |
|                       | Output Duty Cycle                                                        |                   | SYM                                                                                                                                                | @ 50% Level                                                                                                       | 45                             | -                            |          | 55                                 | %  |     |    |
|                       | Rise and Fall Time<br>Model 636M, 636N & 636L                            |                   | T <sub>R</sub> , T <sub>F</sub>                                                                                                                    | @ 10% - 90% Levels, C <sub>L</sub> = 15pF<br>1.0 MHz to 50 MHz<br>50.001 MHz to 125 MHz<br>125.001 MHz to 160 MHz | -<br>-<br>-<br>-               | 6<br>3<br>1.5                |          | 10<br>5<br>2.5                     | ns |     |    |
|                       | Model 636S                                                               |                   |                                                                                                                                                    | 1.0 MHz to 20 MHz<br>20.001 MHz to 50 MHz<br>50.001 MHz to 106.250 MHz                                            | -<br>-<br>-                    | 6<br>3<br>1.5                |          | 8<br>5<br>2                        |    |     |    |
|                       | Start Up Time                                                            |                   |                                                                                                                                                    | T <sub>S</sub>                                                                                                    | Application of V <sub>CC</sub> | -                            |          | 5                                  |    | 10  | ms |
|                       | Period Jitter, Pk-Pk                                                     |                   |                                                                                                                                                    | -                                                                                                                 | -                              | -                            |          | -                                  |    | 100 | ps |
|                       | Period Jitter, RMS                                                       |                   | -                                                                                                                                                  | -                                                                                                                 | -                              | -                            |          | 25                                 |    |     |    |
|                       | Phase Jitter, RMS                                                        |                   | -                                                                                                                                                  | Bandwidth 12 kHz - 20 MHz                                                                                         | -                              | -                            |          | 1                                  |    |     |    |

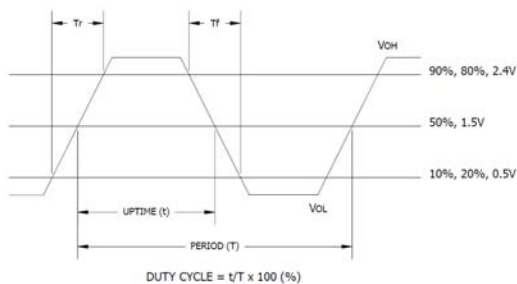
Notes:

1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and aging.

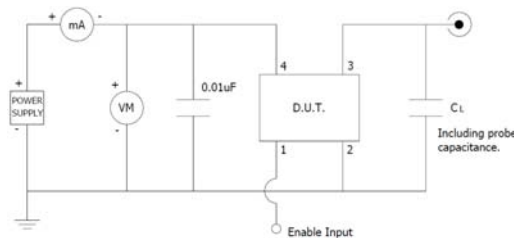
## ELECTRICAL CHARACTERISTICS

|                       | PARAMETER             | SYMBOL    | CONDITIONS                       | MIN  | TYP | MAX | UNIT    |
|-----------------------|-----------------------|-----------|----------------------------------|------|-----|-----|---------|
| ELECTRICAL PARAMETERS | Enable Function       |           |                                  |      |     |     |         |
|                       | Enable Input Voltage  |           |                                  |      |     |     |         |
|                       | Model 636M            | $V_{IH}$  | Pin 1 Logic '1', Output Enabled  | 1.26 | -   | -   | V       |
|                       | Model 636N            |           | Pin 1 Logic '1', Output Enabled  | 1.75 | -   | -   |         |
|                       | Model 636L            |           | Pin 1 Logic '1', Output Enabled  | 2.0  | -   | -   |         |
|                       | Model 636S            |           | Pin 1 Logic '1', Output Enabled  | 4.0  | -   | -   |         |
|                       | Disable Input Voltage |           |                                  |      |     |     |         |
|                       | Model 636M,636N,636L  | $V_{IL}$  | Pin 1 Logic '0', Output Disabled | -    | -   | 0.3 |         |
|                       | Model 636S            |           | Pin 1 Logic '0', Output Disabled | -    | -   | 0.8 |         |
|                       | Enable Time (M,N,L,S) | $T_{PLZ}$ | Pin 1 Logic '1'                  | -    | -   | 10  | ms      |
|                       | Standby Current       | $I_{ST}$  | Pin 1 Logic '0', Output Disabled | -    | -   | 10  | $\mu A$ |

### LVC MOS OUTPUT WAVEFORM



### TEST CIRCUIT, CMOS LOAD

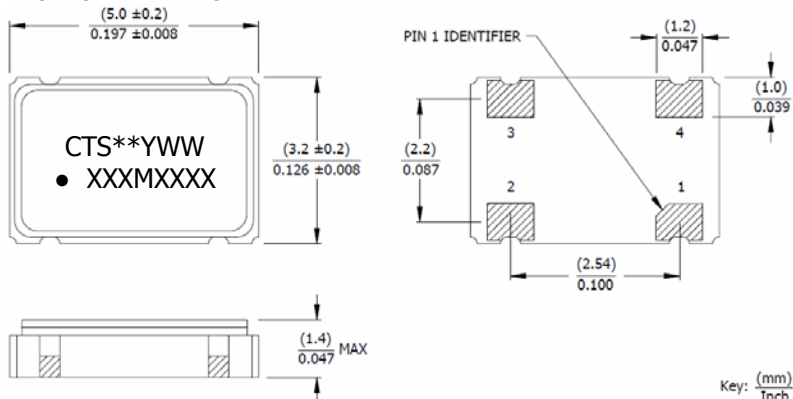


### ENABLE TRUTH TABLE

| PIN 1     | PIN 3     |
|-----------|-----------|
| Logic '1' | Output    |
| Open      | Output    |
| Logic '0' | High Imp. |

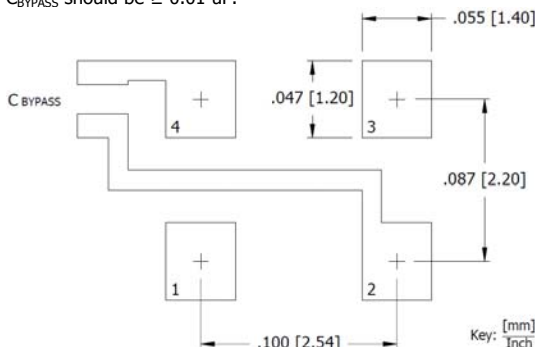
## MECHANICAL SPECIFICATIONS

### PACKAGE DRAWING



### SUGGESTED SOLDER PAD GEOMETRY

$C_{BYPASS}$  should be  $\geq 0.01 \mu F$ .



### MARKING INFORMATION

- \*\* - Manufacturing Site Code.
- YWW - Date code, Y - year, WW - week.
- XXMXXXX - Frequency is marked with only leading significant digits before the 'M' and 4 digits after the 'M' (including zeros).  
Ex. XXMXXXX (62M5000)  
XXMXXXX (155M5200)

### NOTES

- Termination pads (e4). Barrier-plating is nickel (Ni) with gold (Au) flash plate.
- Reflow conditions per JEDEC J-STD-020, 260°C maximum.
- Moisture Sensitivity Level 1 per JEDEC J-STD-020.

### D.U.T. PIN ASSIGNMENTS

| PIN | SYMBOL   | DESCRIPTION              |
|-----|----------|--------------------------|
| 1   | EOH      | Enable                   |
| 2   | GND      | Circuit & Package Ground |
| 3   | Output   | RF Output                |
| 4   | $V_{CC}$ | Supply Voltage           |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.