Wolfgang Knap
Gesellschaft m.b.H. & Co.KG

A-1130 Wien
Lilienberggasse 13
Tel.: +43-1-403 08 12
Fax: +43-1-408 72 13
e-mail: info@knap.at
http://www.knap.at

# 3,2x5mm SMT CRYSTAL-OSCILLATORS
# GMPA / GMHA / GMLA / GMTA




| FREQUENZSTABILITÄT *FREQUENCY STABILITY* | |
|---|---|
| Modell *Model* | |
| GM1PA/GM1LA/GM1HA/GM1TA | ±100ppm/-10~+70°C |
| GM2PA/GM2LA/GM2HA/GM2TA | ±50ppm/-10~+70°C |
| GM3PA/GM3LA/GM3HA/GM3TA | ±25ppm/-10~+70°C |
| GM1PAR/GM1LAR/GM1HAR/GM1TAR | ±100ppm/-40~+85°C |
| GM2PAR/GM2LAR/GM2HAR/GM2TAR | ±50ppm/-40~+85°C |

| BETRIEBSBEDINGUNGEN *OPERATING CONDITIONS* | | |
|---|---|---|
| Betriebstemperatur *operating temp.* | -10~+70°C, -40~+85°C | |
| Lagertemperatur *storage temperature* | -55~+125°C | |
| Betriebsspannung $V_{DD}$ *supply voltage* | GMPA<br>GMLA, GMHA, GMTA | +3,3V ±0,3V<br>+5,0V ±0,5V |

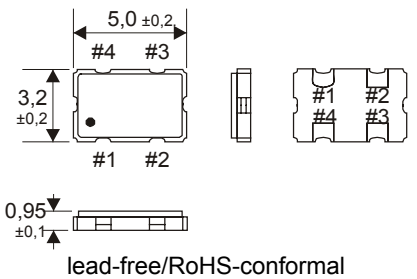
**Elektrische Daten *electrical characteristics***

$T_a$ = 25°C, $V_{DD}$ = 3,3 V or 5,0 V, $C_L$ = 15 pF (GMPA, GMLA), $C_L$=50 pF (GMHA), $R_L$=400 Ω (GMTA)

| Parameter *parameter* | | Bedingungen *conditions* | Frequenzbereich *frequ. range (MHz)* | GMPA | GMLA | GMHA | GMTA |
|---|---|---|---|---|---|---|---|
| max. Stromaufnahme *max. input current* | $I_{DD}$ | | 1,800 ~ 50,000 | 20 mA | 35 mA | 45 mA | 26 mA |
| Frequenzstabilität *frequency stability* | | über alles *)<br>all conditions *) | | ±25 ppm ~ ±100 ppm | | | |
| Tastverhältnis *symmetry* | | @50% $V_{DD}$<br>@1,4 V | | 40/60 %<br>- | | | -<br>40/60 % |
| Ausgangsspannung *output voltage* | $V_{OL}$<br>$V_{OH}$ | "0" level<br>"1" level | | 10% $V_{DD}$ max.<br>90% $V_{DD}$ min. | 0,5 V max.<br>4,5 V min. | | 0,4 V max.<br>2,4 V min. |
| Anstiegszeit max. *rise time max.* | $T_R$ | 10% - 90% $V_{DD}$<br>0,5 - 4,5 V<br>0,4 - 2,4 V | | 7 ns<br>-<br>- | -<br>10 ns<br>- | -<br>7 ns<br>- | -<br>-<br>5,0 ns |
| Abfallzeit max. *fall time max.* | $T_F$ | 90% - 10% $V_{DD}$<br>4,5 - 0,5 V<br>2,4 - 0,4 V | | 7 ns<br>-<br>- | -<br>10 ns<br>- | -<br>7 ns<br>- | -<br>-<br>5,0 ns |
| Ausgangsstrom min. *output current min.* | $I_{OL}$<br>$I_{OH}$ | "0" level<br>"1" level | | 2 mA<br>2 mA | 4 mA<br>4 mA | 16 mA<br>16 mA | 16 mA<br>4 mA |
| Standbystrom max. *standby current max.* | | $V_{IL} \leq 30\%\ V_{DD}$ | | 10 µA | - | | |
| max. Belastbarkeit *max. driving ability* | | TTL | | 10 LS-TTL | | 10 N-TTL | |
| | | HCMOS | | 15 pF | 15 pF | 50 pF | - |
| Startzeit max. *start-up time max.* | | 0,0 ~ $V_{DD}$ | | 10 ms | | | |

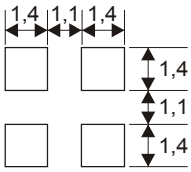
*) Anmerkung: inkl. Abgleichtoleranz, Temperaturgang, Spannungs- und Laständerung, Alterung, Schock und Vibration
*note: incl. frequency and temperature tolerance, supply voltage and load change, aging, shock and vibration*

Abmessungen in mm
*dimensions in mm*




lead-free/RoHS-conformal

empfohlenes Layout
*recommended solder pad layout*




RoHS 2002/95/EC

| Anschlußbelegung *pin connections* | |
|---|---|
| #1 | E/D |
| #2 | GND |
| #3 | OUT |
| #4 | $V_{DD}$ |

| Funktionstabelle *enable /disable function* | | |
|---|---|---|
| GMLA/HA/TA | GMPA | |
| control (pin #1) | control (pin #1) | output (pin #3) |
| open | open | active |
| "1" ($V_{IH} \geq$ 2,2V) | "1" ($V_{IH} \geq$ 70% $V_{DD}$) | active |
| "1" ($V_{IL} \leq$ 0,8V) | "0" ($V_{IL} \leq$ 30% $V_{DD}$) | high Z |