# BCR16LM-16LH

## Triac
## Medium Power Use

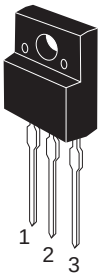
R07DS0504EJ0100
Rev.1.00
Jul 07, 2011

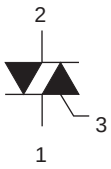
### Features

- $I_{T\ (RMS)}$ : 16 A
- $V_{DRM}$ : 800 V
- $I_{FGTI}$, $I_{RGTI}$, $I_{RGT\ III}$ : 50 mA or 35mA ($I_{GT}$ item:1)
- High Commutation
- $V_{iso}$ : 1800V
- The Product guaranteed maximum junction temperature 150°C
- Insulated Type
- Planar Type
- UL Recognized: File No. E223904

### Outline

RENESAS Package code: PRSS0003AF-A)
(Package name: TO-220FL)




1. $T_1$ Terminal
2. $T_2$ Terminal
3. Gate Terminal

### Applications

Switching mode power supply, motor control, heater control, and other general purpose AC power control applications

### Maximum Ratings

| Parameter | Symbol | Voltage class | Unit |
|---|---|---|---|
| | | 16 | |
| Repetitive peak off-state voltage[Note1] | $V_{DRM}$ | 800 | V |
| Non-repetitive peak off-state voltage[Note1] | $V_{DSM}$ | 960 | V |

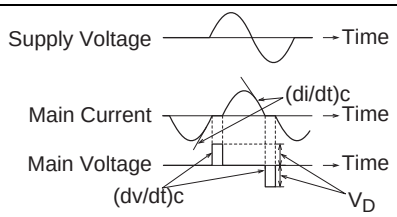
Notes: 1. Gate open.

| Parameter | Symbol | Ratings | Unit | Conditions |
|---|---|---|---|---|
| RMS on-state current | $I_{T\ (RMS)}$ | 16 | A | Commercial frequency, sine full wave 360° conduction, Tc = 87°C |
| Surge on-state current | $I_{TSM}$ | 160 | A | 60 Hz sinewave 1 full cycle, peak value, non-repetitive |
| $I^2t$ for fusion | $I^2t$ | 106.5 | $A^2s$ | Value corresponding to 1 cycle of half wave 60 Hz, surge on-state current |
| Peak gate power dissipation | $P_{GM}$ | 5 | W | |
| Average gate power dissipation | $P_{G\ (AV)}$ | 0.5 | W | |
| Peak gate voltage | $V_{GM}$ | 10 | V | |
| Peak gate current | $I_{GM}$ | 2 | A | |
| Junction Temperature | Tj | –40 to +150 | °C | |
| Storage temperature | Tstg | –40 to +150 | °C | |
| Mass | — | 2.0 | g | Typical value |
| Isolation voltage | $V_{iso}$ | 1800 | V | Ta = 25°C, AC 1 minute, T1 • T2 • G terminal to case |

## Electrical Characteristics

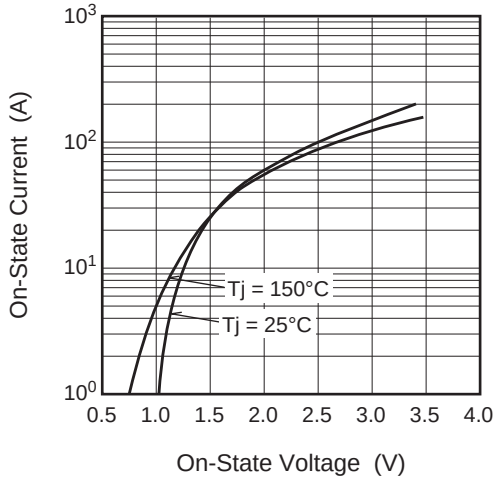
| Parameter | | Symbol | BCR16LM-16LH-1 ($I_{GT}$ item : 1) | | | BCR16LM-16LH | | | Unit | Test conditions |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. | | |
| Repetitive peak off-state current | | $I_{DRM}$ | — | — | 2.0 | — | — | 2.0 | mA | Tj = 125°C<br>$V_{DRM}$ applied |
| | | | — | — | 5.0 | — | — | 5.0 | mA | Tj = 150°C<br>$V_{DRM}$ applied |
| On-state voltage | | $V_{TM}$ | — | — | 1.5 | — | — | 1.5 | V | Tc = 25°C, $I_{TM}$ = 25 A instantaneous measurement |
| Gate trigger voltage[Note2] | I | $V_{FGTI}$ | — | — | 1.5 | — | — | 1.5 | V | Tj = 25°C, $V_D$ = 6 V<br>$R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $V_{RGTI}$ | — | — | 1.5 | — | — | 1.5 | V | |
| | III | $V_{RGTIII}$ | — | — | 1.5 | — | — | 1.5 | V | |
| Gate trigger curent[Note2] | I | $I_{FGTI}$ | — | — | 35 | — | — | 50 | mA | Tj = 25°C, $V_D$ = 6 V<br>$R_L$ = 6 Ω, $R_G$ = 330 Ω |
| | II | $I_{RGTI}$ | — | — | 35 | — | — | 50 | mA | |
| | III | $I_{RGTIII}$ | — | — | 35 | — | — | 50 | mA | |
| Gate non-trigger voltage | | $V_{GD}$ | 0.2 | — | — | 0.2 | — | — | V | Tj = 125°C<br>$V_D$ = 1/2 $V_{DRM}$ |
| | | | 0.1 | — | — | 0.1 | — | — | V | Tj = 150°C<br>$V_D$ = 1/2 $V_{DRM}$ |
| Thermal resistance | | $R_{th\ (j-c)}$ | — | — | 3.5 | — | — | 3.5 | °C/W | Junction to case[Note3] |
| Critical-rate of decay of on-state commutating current [Note4] | | (di/dt)c | 9 | — | — | 15 | — | — | A/ms | Tj = 125°C<br>(dv/dt)c < 100 V/μs |

Notes: 2. Measurement using the gate trigger characteristics measurement circuit.
3. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 0.5°C/W.
4. Test conditions of the critical-rate of decay of on-state commutation current are shown in the table below.

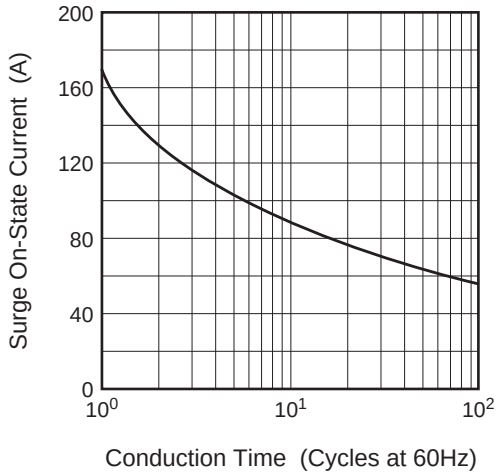
| Test conditions | Commutating voltage and current waveforms (inductive load) |
|---|---|
| 1. Junction temperature<br>Tj = 125°C<br>2. Peak off-state voltage<br>$V_D$ = 400 V<br>2. Rate of rise of off-state commutating voltage<br>(dv/dt)c < 100 V/μs |  |

## Performance Curves

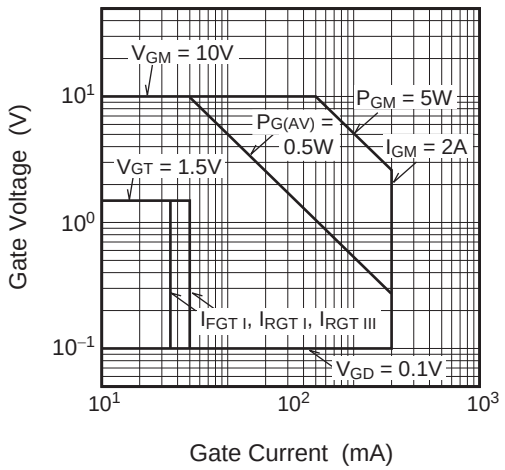
Maximum On-State Characteristics



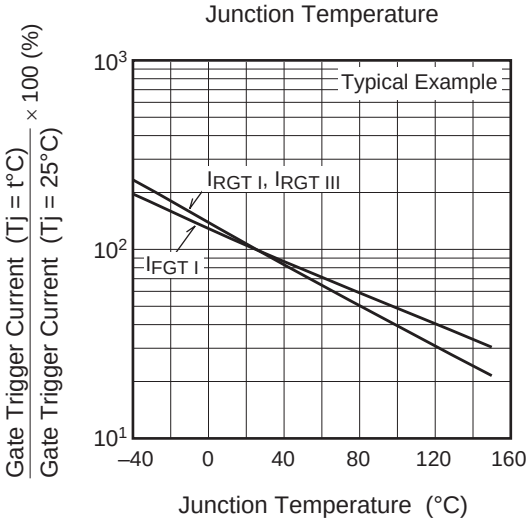

Rated Surge On-State Current



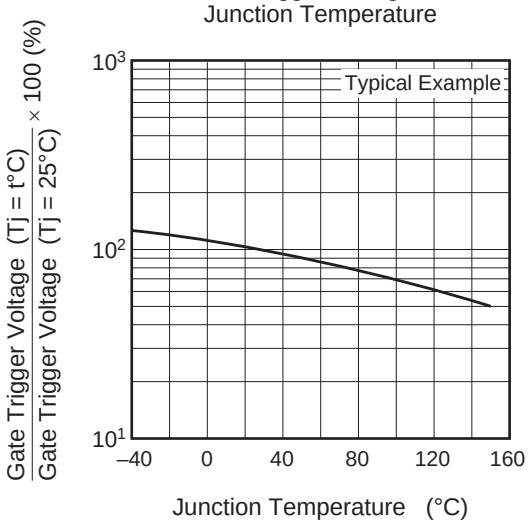

Gate Characteristics



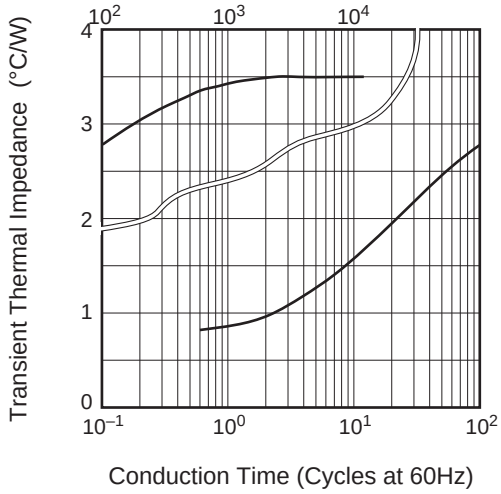

Gate Trigger Current vs. Junction Temperature



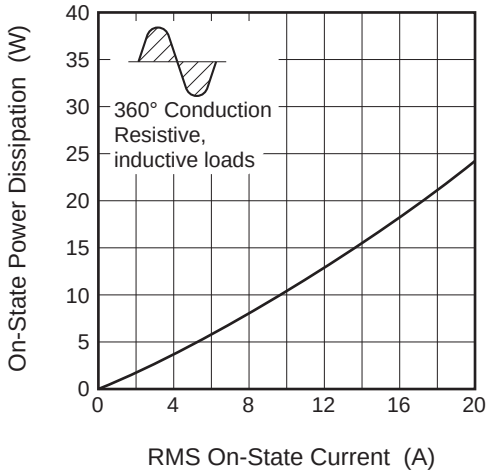

Gate Trigger Voltage vs. Junction Temperature



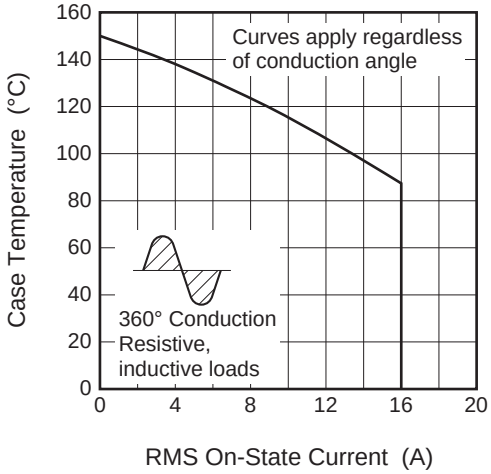

Maximum Transient Thermal Impedance Characteristics (Junction to case)



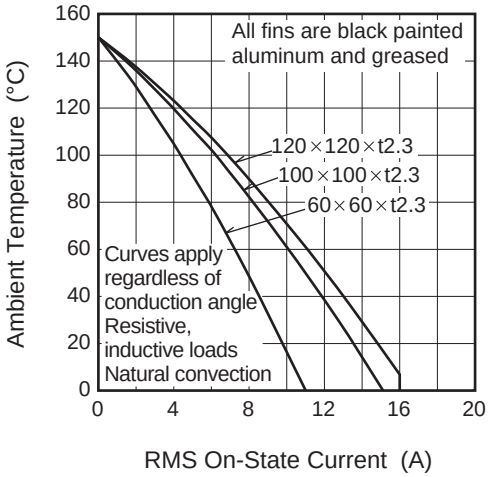
Maximum On-State Power Dissipation



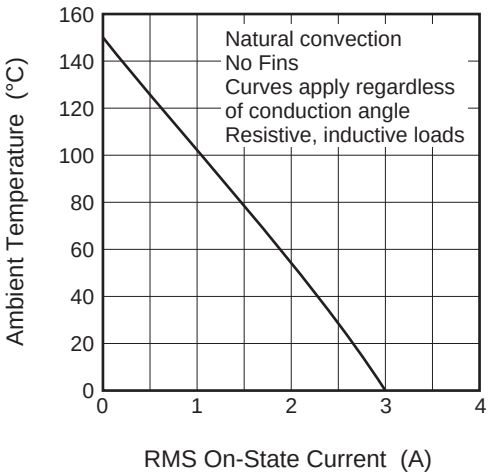

Allowable Case Temperature vs.
RMS On-State Current



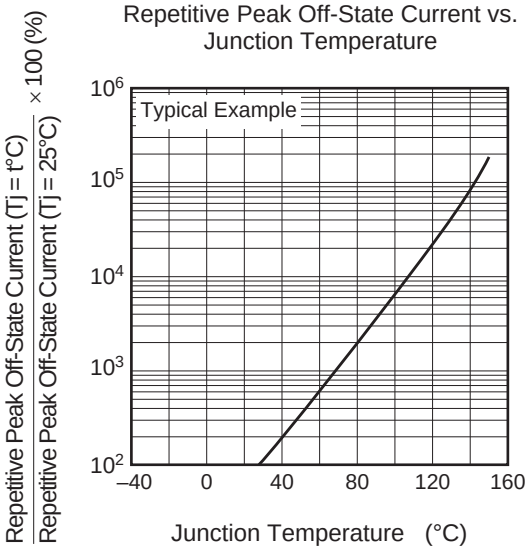

Allowable Ambient Temperature vs.
RMS On-State Current



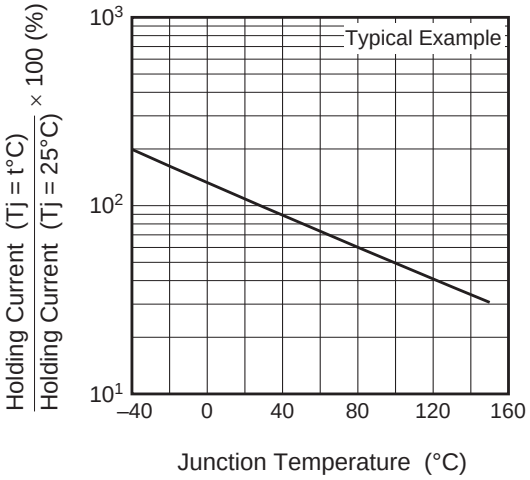

Allowable Ambient Temperature vs.
RMS On-State Current



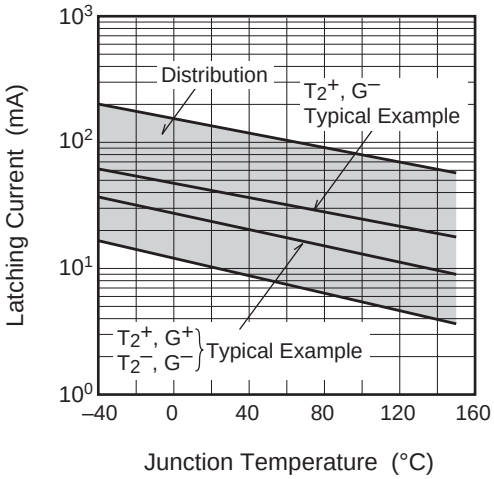

Repetitive Peak Off-State Current vs.
Junction Temperature



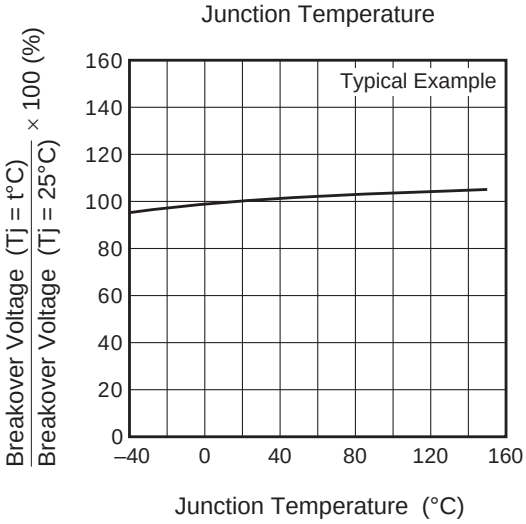

Holding Current vs.
Junction Temperature



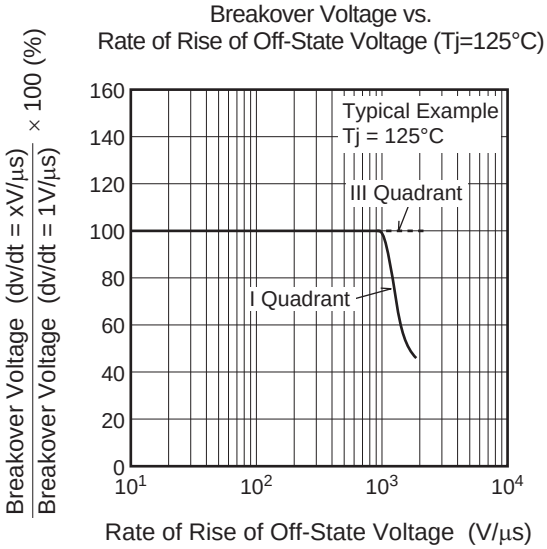
Latching Current vs.
Junction Temperature



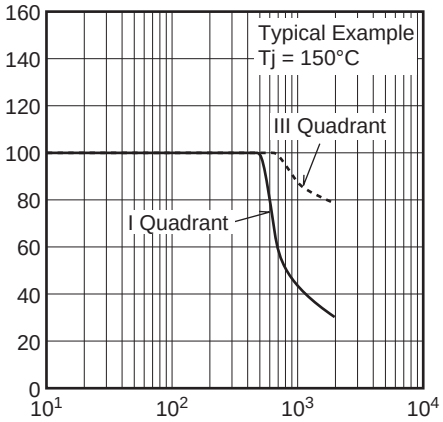

Breakover Voltage vs.
Junction Temperature



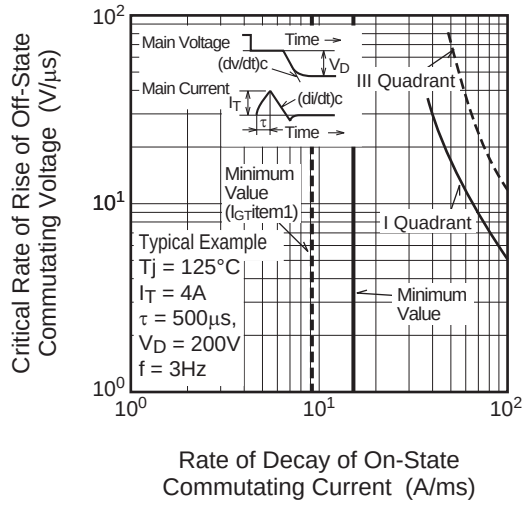

Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=125°C)



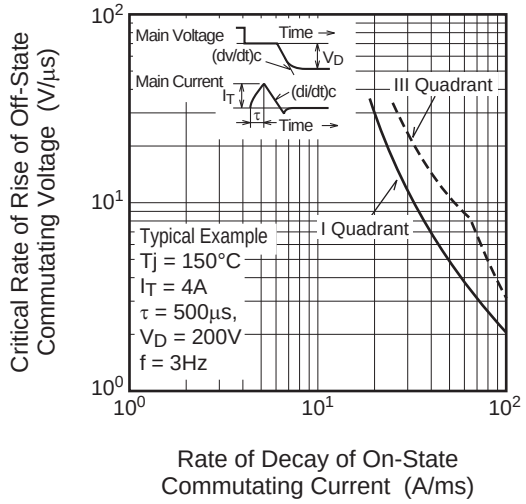

Breakover Voltage vs.
Rate of Rise of Off-State Voltage (Tj=150°C)



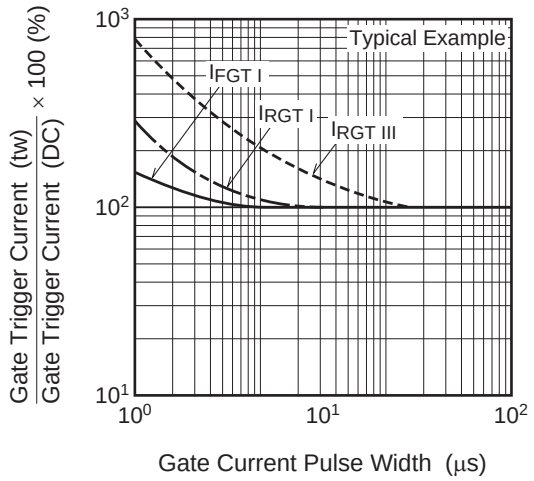

Commutation Characteristics (Tj=125°C)



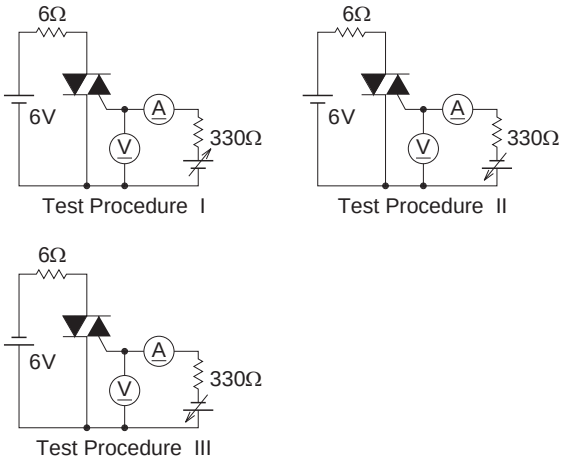

Commutation Characteristics (Tj=150°C)



Gate Trigger Current vs.
Gate Current Pulse Width



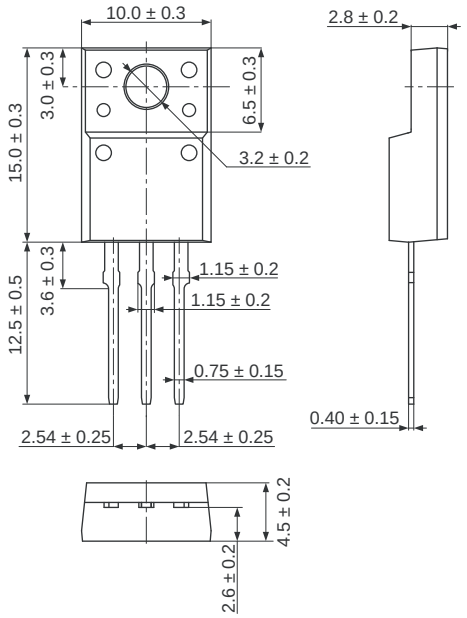

Gate Trigger Characteristics Test Circuits



## Package Dimensions

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| TO-220FL | — | PRSS0003AF-A | TO-220FL | 1.5g |

Unit: mm




## Ordering Information

| Orderable Part Number | Packing | Quantity | Remark |
|---|---|---|---|
| BCR16LM-16LH#B00 | Tube | 50 pcs. | Straight type |
| BCR16LM-16LH-1#B00 | Tube | 50 pcs. | Straight type, $I_{GT}$ item;1 |
| BCR16LM-16LH-A8#B00 | Tube | 50 pcs. | A8 Lead form |
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