



Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F

Benefits

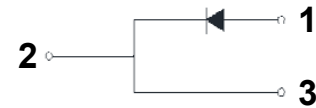
- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC converters



TO-220C-2L



| Part Number | Package | Qty(PCS) |
|-------------------|------------|----------|
| HIDH08G120C5XKSA1 | TO-220C-2L | 50 |

Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise specified)

| Symbol | Parameter | Value | Unit | Test Conditions | Note |
|---------------|---------------------------------------|-----------------|----------------------|---|--------|
| V_{RRM} | Repetitive Peak Reverse Voltage | 1200 | V | | |
| V_{RSM} | Surge Peak Reverse Voltage | 1300 | V | | |
| V_R | DC Peak Reverse Voltage | 1200 | V | | |
| I_F | Continuous Forward Current | 24.5 12 8 | A | $T_c=25^\circ\text{C}$ $T_c=135^\circ\text{C}$ $T_c=157^\circ\text{C}$ | Fig. 3 |
| I_{FRM} | Repetitive Peak Forward Surge Current | 37.5 25 | A | $T_c=25^\circ\text{C}$, $t_p=10$ ms, Half Sine Pulse $T_c=110^\circ\text{C}$, $t_p=10$ ms, Half Sine Pulse | |
| I_{FSM} | Non-Repetitive Forward Surge Current | 64 49.5 | A | $T_c=25^\circ\text{C}$, $t_p=10$ ms, Half Sine Pulse $T_c=110^\circ\text{C}$, $t_p=10$ ms, Half Sine Pulse | Fig. 8 |
| $I_{F,Max}$ | Non-Repetitive Peak Forward Current | 600 480 | A | $T_c=25^\circ\text{C}$, $t_p=10$ ms, Pulse $T_c=110^\circ\text{C}$, $t_p=10$ ms, Pulse | Fig. 8 |
| P_{tot} | Power Dissipation | 136.5 59 | W | $T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$ | Fig. 4 |
| dV/dt | Diode dV/dt ruggedness | 200 | V/ns | $V_R=0-960\text{V}$ | |
| $\int i^2 dt$ | i^2t value | 20.5 12.25 | A^2s | $T_c=25^\circ\text{C}$, $t_p=10$ ms $T_c=110^\circ\text{C}$, $t_p=10$ ms | |
| T_J | Operating Junction Range | -55 to +175 | $^\circ\text{C}$ | | |
| T_{stg} | Storage Temperature Range | -55 to +135 | $^\circ\text{C}$ | | |
| | TO-220 Mounting Torque | 1 8.8 | Nm lbf-in | M3 Screw 6-32 Screw | |



Electrical Characteristics

| Symbol | Parameter | Typ. | Max. | Unit | Test Conditions | Note |
|--------|---------------------------|-----------------|------------|---------------|--|--------|
| V_F | Forward Voltage | 1.5 2.2 | 1.8 3 | V | $I_F = 8\text{ A}$ $T_J = 25^\circ\text{C}$ $I_F = 8\text{ A}$ $T_J = 175^\circ\text{C}$ | Fig. 1 |
| I_R | Reverse Current | 35 100 | 250 350 | μA | $V_R = 1200\text{ V}$ $T_J = 25^\circ\text{C}$ $V_R = 1200\text{ V}$ $T_J = 175^\circ\text{C}$ | Fig. 2 |
| Q_C | Total Capacitive Charge | 37 | | nC | $V_R = 800\text{ V}$, $I_F = 8\text{ A}$ $di/dt = 200\text{ A}/\mu\text{s}$ $T_J = 25^\circ\text{C}$ | Fig. 5 |
| C | Total Capacitance | 560 37 27 | | pF | $V_R = 0\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 400\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ $V_R = 800\text{ V}$, $T_J = 25^\circ\text{C}$, $f = 1\text{ MHz}$ | Fig. 6 |
| E_C | Capacitance Stored Energy | 10.5 | | μJ | $V_R = 800\text{ V}$ | Fig. 7 |

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

| Symbol | Parameter | Typ. | Unit | Note |
|-----------------|--|------|---------------------------|--------|
| $R_{\theta JC}$ | Thermal Resistance from Junction to Case | 1.1 | $^\circ\text{C}/\text{W}$ | Fig. 9 |

Typical Performance

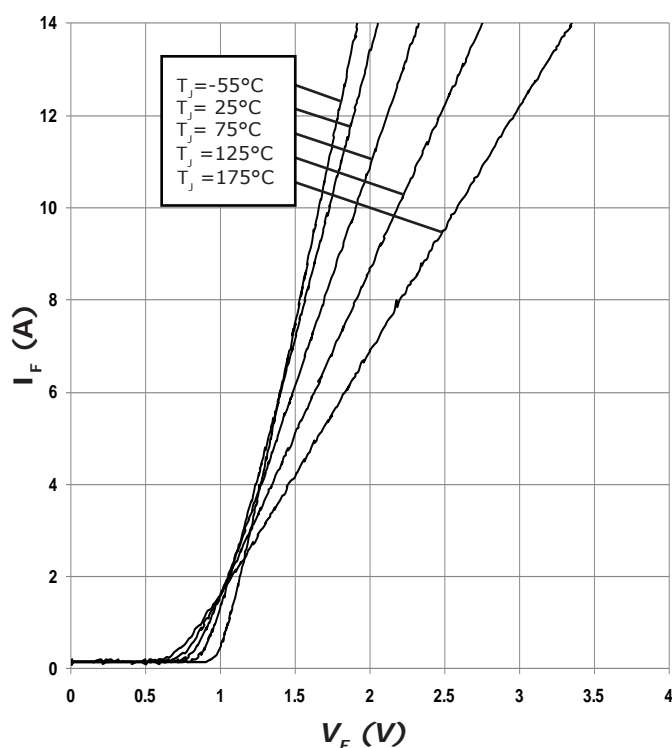


Figure 1. Forward Characteristics

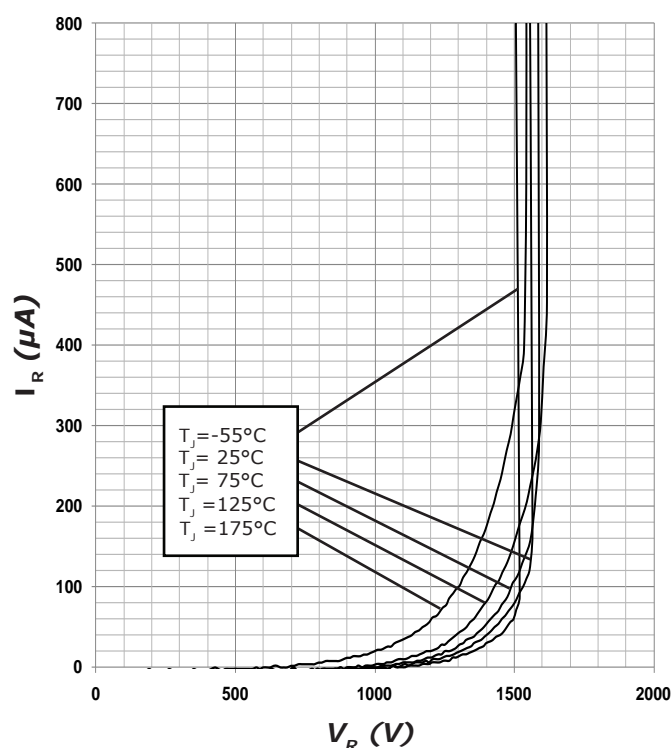


Figure 2. Reverse Characteristics



Typical Performance

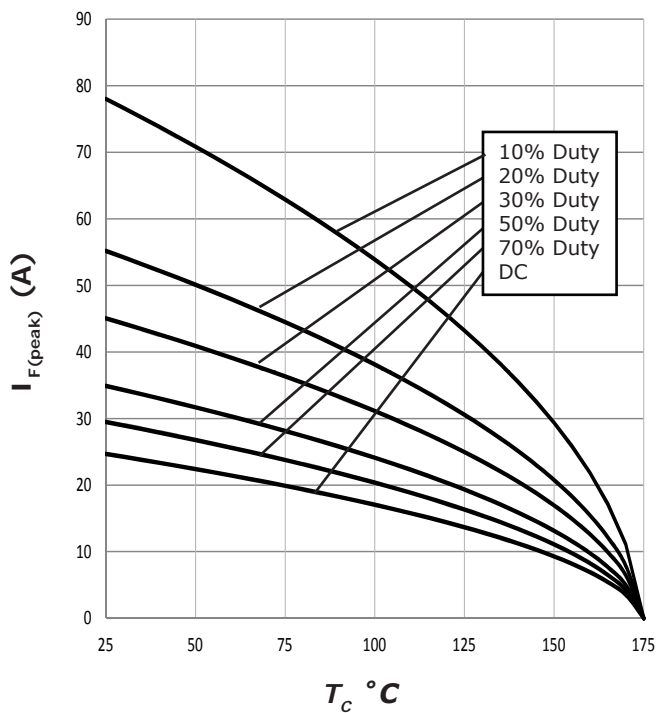


Figure 3. Current Derating

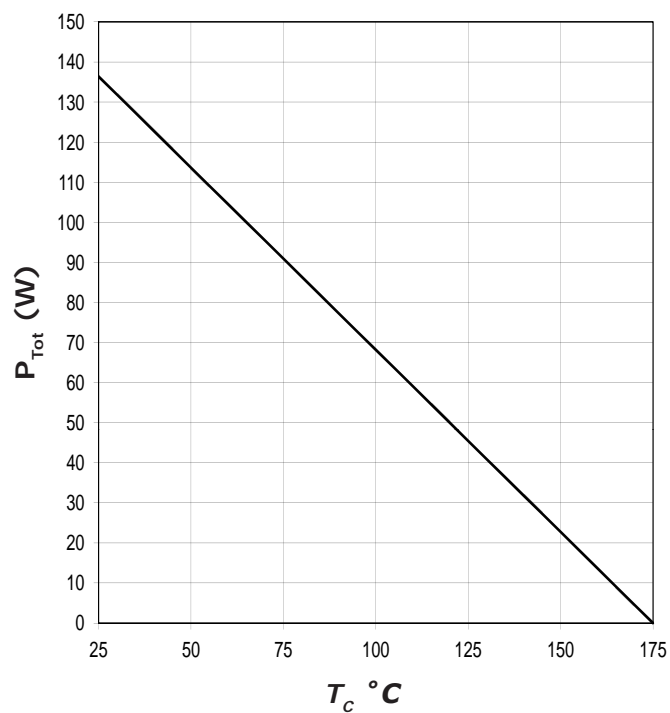


Figure 4. Power Derating

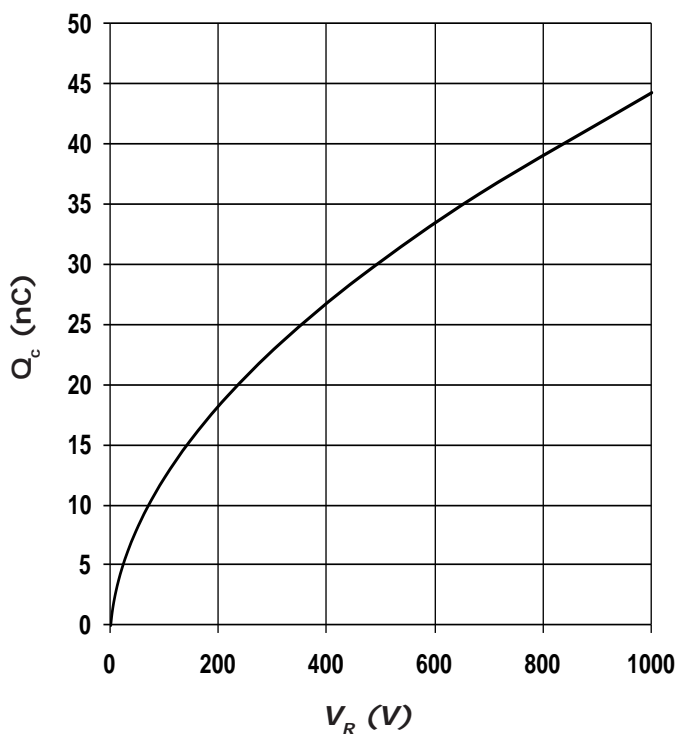


Figure 5. Recovery Charge vs. Reverse Voltage

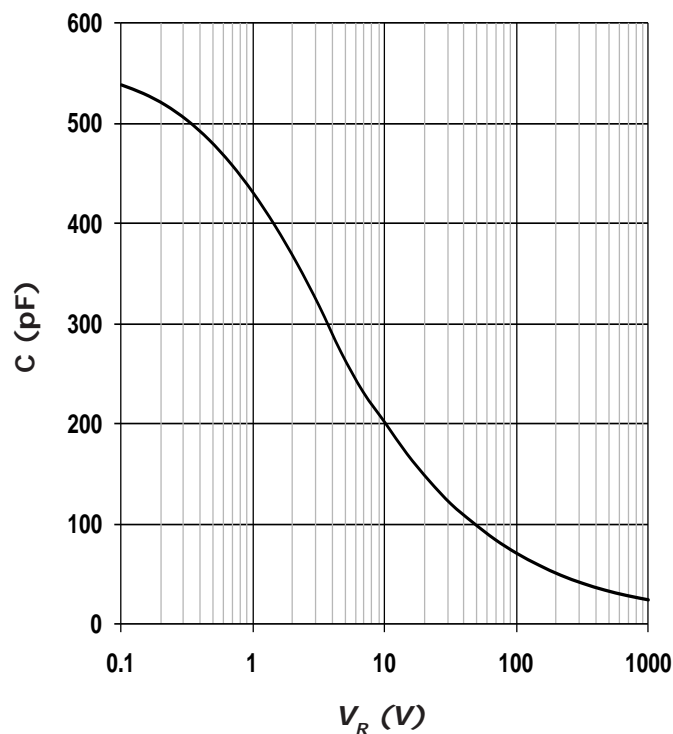


Figure 6. Capacitance vs. Reverse Voltage



Typical Performance

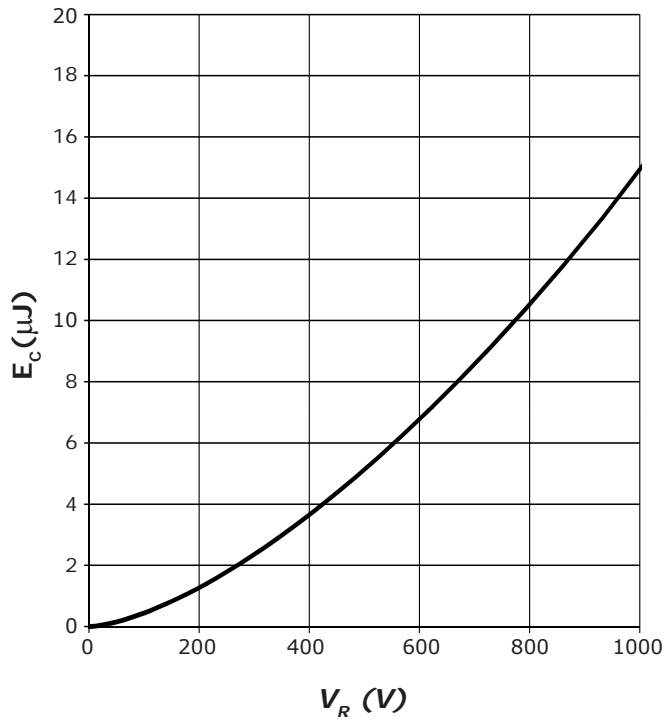


Figure 7. Typical Capacitance Stored Energy

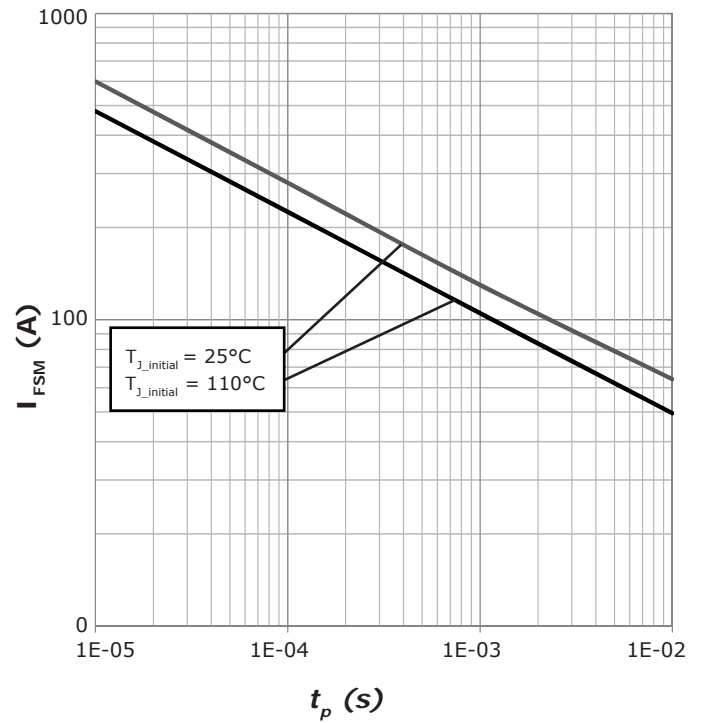


Figure 8. Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

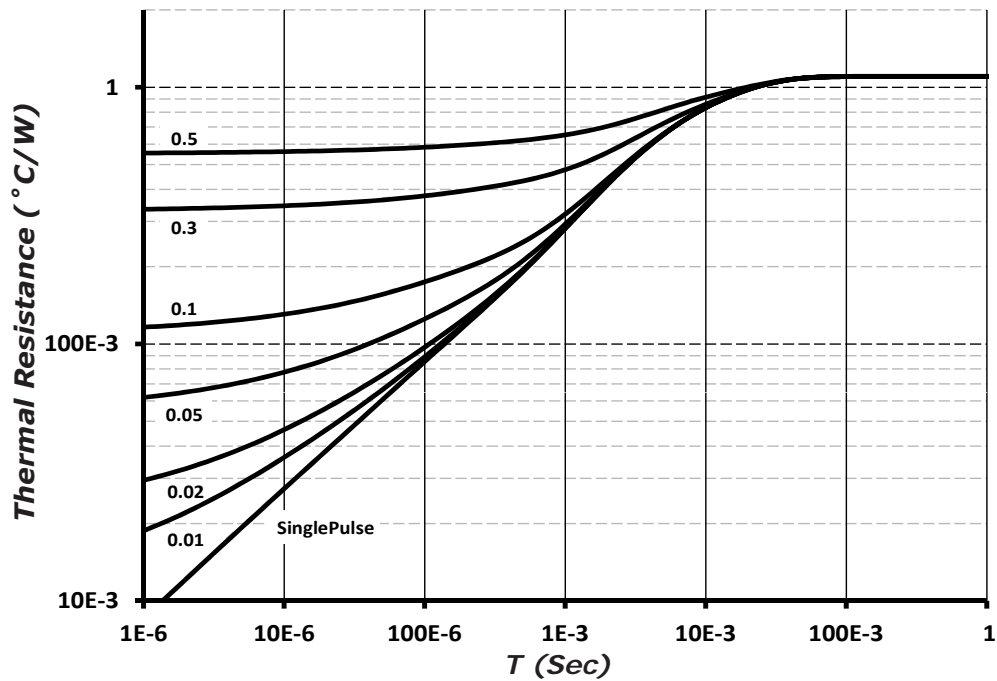
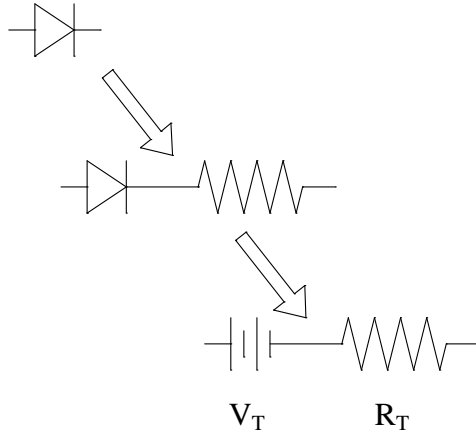


Figure 9. Transient Thermal Impedance



Diode Model



$$V_{fT} = V_T + I_f * R$$

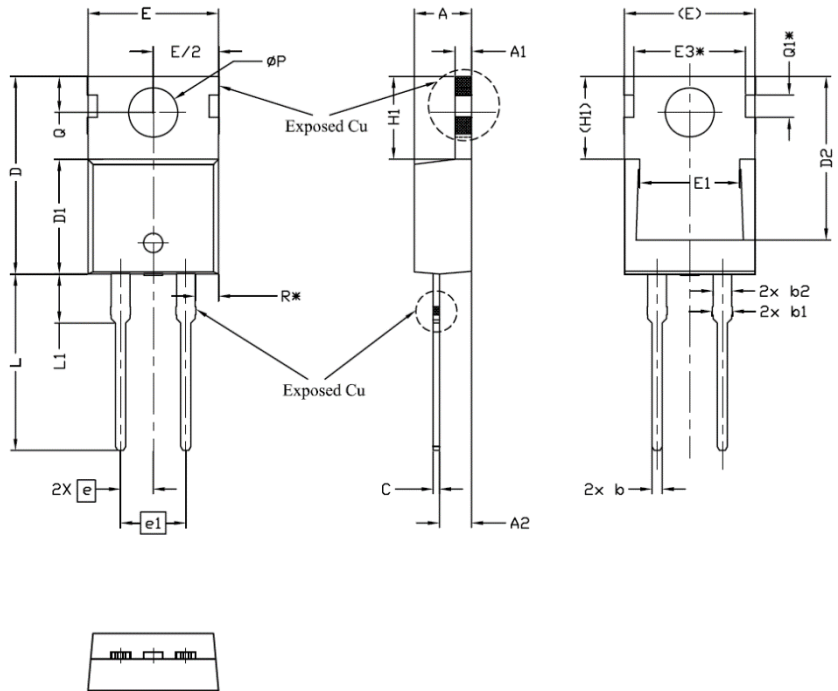
$$V_T = 0.96 + (T_J * -2.1 * 10^{-3})$$

$$R_T = 0.06 + (T_J * 8.0 * 10^{-4})$$

Note: T_J = Diode Junction Temperature In Degrees Celsius,
valid from 25°C to 175°C

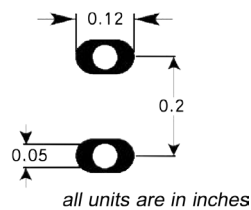


Package Information TO-220C-2L



| SYMBOL | DIMENSIONS | | | NOTES |
|--------|------------|-------|-------|-------|
| | MIN. | NOM. | MAX. | |
| A | 4,24 | 4,44 | 4,64 | |
| A1 | 1.15 | 1.27 | 1.40 | |
| A2 | 2.30 | 2,48 | 2,70 | |
| b | 0.70 | 0.80 | 0.90 | |
| b1 | 1.20 | 1,55 | 1,75 | |
| b2 | 1,20 | 1,45 | 1,70 | |
| c | 0.40 | 0.50 | 0.60 | |
| D | 14,70 | 15,37 | 16,00 | 4 |
| D1 | 8,82 | 8,92 | 9,02 | |
| D2 | 12,43 | 12,73 | 12,83 | 5 |
| E | 9,96 | 10,16 | 10,36 | 4,5 |
| E1 | 6,86 | 7,77 | 8,89 | 5 |
| E3* | 8,70REF. | | | |
| e | 2,54BSC | | | |
| e1 | 5,08BSC | | | |
| H1 | 6,30 | 6,45 | 6,60 | 5,6 |
| L | 13,47 | 13,72 | 13,97 | |
| L1 | 3,60 | 3,80 | 4,00 | |
| ØP | 3,75 | 3,84 | 3,93 | |
| Q | 2,60 | 2,80 | 3,00 | |
| Q1* | 1,73REF. | | | |
| R* | 1,82REF. | | | |

Recommended Solder Pad Layout



TO-220C-2L



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