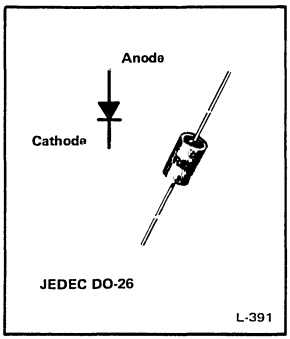
RCA Solid State Division

# Rectifiers

# D2601 Series




## 1-A, 50-to-800-V Fast-Recovery Silicon Rectifiers

General-Purpose Types for Medium-Current Applications

*Features:*

- Fast reverse-recovery time ($t_{rr}$) — 0.5 μs max. ($I_{FM}$ = 20 A peak see test circuit Fig. 13) 0.2 μs max. ($I_F$ = 1 A, $I_{RM}$ = 2 A max., see test circuit Fig. 14)
- Low overshoot current
- Low forward-voltage drop
- Low-thermal-resistance hermetic package

| Voltage / Package | 50 V | 100 V | 200 V | 400 V | 600 V | 800 V |
|---|---|---|---|---|---|---|
| DO-26 | D2601F | D2601A | D2601B (TA7892) | D2601D (TA7893) | D2601M (TA7894) | D2601N (TA7895) |

Numbers in parentheses (e.g. TA7892) are former RCA-Dev. Type numbers

RCA-D2601-series rectifiers are silicon diffused-junction-types in an axial-lead hermetic package. They differ only in their voltage ratings.

These devices feature fast recovery times (0.5 μs max. from 20 A peak) without the "snap" type of turn-off which could result in the generation of transients.

Types D2601A, B, D, F, M, and N are intended for use in high-speed inverters, choppers, high-frequency rectifiers, "free-wheeling" diode circuits, and other high-frequency applications.

**MAXIMUM RTAINGS,** *Absolute-Maximum Values:*

| | | D2601F | D2601A | D2601B | D2601D | D2601M | D2601N | |
|---|---|---|---|---|---|---|---|---|
| REVERSE VOLTAGE: | | | | | | | | |
| REPETITIVE PEAK | $V_{RRM}$ | 50 | 100 | 200 | 400 | 600 | 800 | V |
| NON-REPETITIVE PEAK | $V_{RSM}$ | 100 | 200 | 300 | 500 | 700 | 1000 | V |
| FORWARD CURRENT:• | | | | | | | | |
| Conduction angle = 180°, half-sine-wave | | | | | | | | |
| RMS | $I_{F(RMS)}$ | 1.5 | | | | | | A |
| Average | $I_o$ | 1 | | | | | | A |
| PEAK-SURGE (NON-REPETITIVE) CURRENT: | | | | | | | | |
| At junction temperature ($T_J$) = 150°C | | | | | | | | |
| For one-half cycle of applied voltage, 60 Hz (8.3 ms) | | 35 | | | | | | A |
| For other durations | | See Fig. 2 | | | | | | |
| PEAK (REPETITIVE) CURRENT | $I_{FRM}$ | 6 | | | | | | A |
| TEMPERATURE RANGE: | | | | | | | | |
| Storage | $T_{stg}$ | −40 to 165 | | | | | | °C |
| Operating (Junction) | $T_J$ | −40 to 150 | | | | | | °C |
| LEAD TEMPERATURE (During Soldering): | $T_L$ | | | | | | | |
| At a distance of 1/8 in. (3.17 mm) from case for 10 s max. | | 225 | | | | | | °C |

• At lead temperature of 100°C (measured at point of anode lead 1/8 in. (3.17 mm) from the case).

## ELECTRICAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | LIMITS ALL TYPES MIN. | LIMITS ALL TYPES MAX. | UNITS |
|---|---|---|---|---|
| Reverse Current: | | | | |
| *Static* | | | | |
| For $V_{RRM}$ = max. rated value, $I_F$ = 0, $T_J$ = 25°C | $I_{RM}$ | – | 15 | μA |
| $T_J$ = 100°C | | – | 250 | |
| *Dynamic* | | See Fig. 9 | | |
| Instantaneous Forward Voltage Drop: At $i_F$ = 4 A, $T_J$ = 25°C (See Fig. 3) | $v_F$ | – | 1.9 | V |
| Reverse Recovery Time: For circuit shown in Fig. 13, at $I_{FM}$ = 20 A, $-di_F/dt$ = −20 A/μs, plus duration = 2.8 μs, $T_C$ = 25°C | $t_{rr}$ | – | 0.5 | μs |
| For circuit shown in Fig. 14, at $I_F$ = 1 A, $I_{RM}$ = 2 max., $T_C$ = 25°C | | – | 0.2 | |
| Thermal Resistance (Junction-to-Lead)■ | $R_{\theta JL}$ | – | 45 | °C/W |

■ Measured at point on anode lead 1/8 in. (3.17 mm) from case

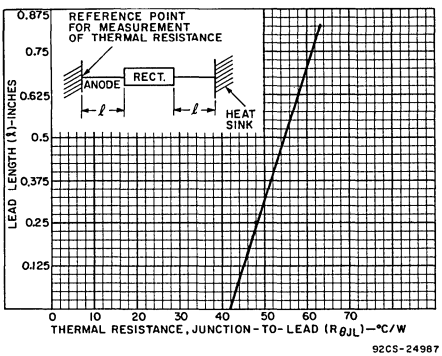



*Fig. 1 — Average forward-power dissipation vs. lead temperature.*

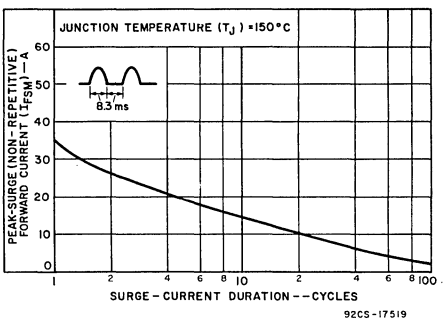



*Fig. 2 — Peak-surge (non-repetitive) forward current vs. surge-current duration.*

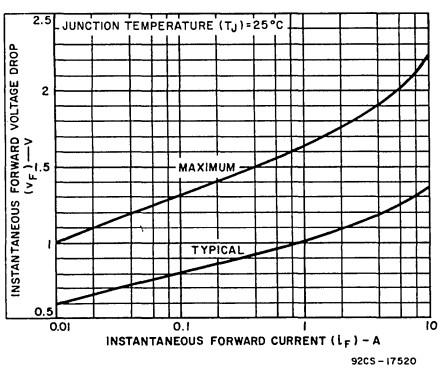



*Fig. 3 — Forward-voltage drop vs. forward current.*

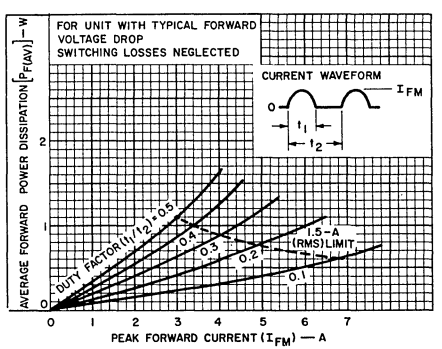



*Fig. 4 — Average forward power dissipation as a function of peak current and duty factor for units with typical forward voltage drop.*

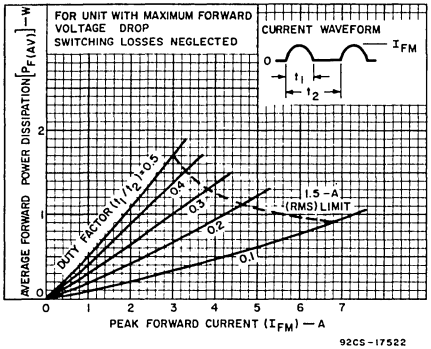



*Fig. 5 — Average forward power dissipation as a function of peak current and duty factor for units with maximum forward voltage drop.*

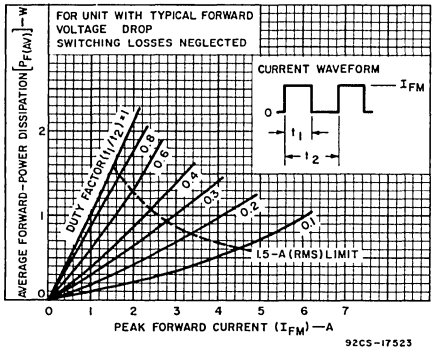



*Fig. 6 — Average forward power dissipation as a function of peak current and duty factor for units with typical forward voltage drop.*

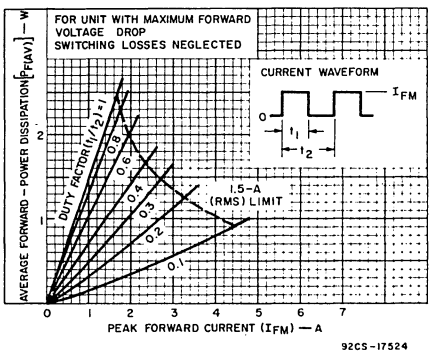



*Fig. 7 — Average forward power dissipation as a function of peak current and duty factor for units with maximum forward voltage drop.*

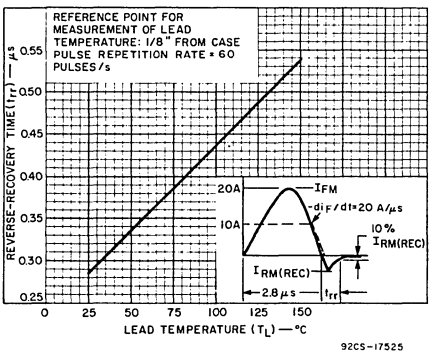



*Fig. 8 — Typical variation of reverse-recovery time with lead temperature.*

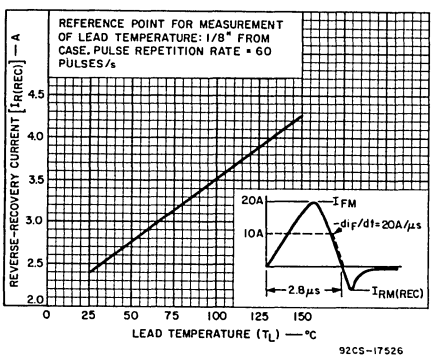



*Fig. 9 — Reverse-recovery current vs. lead temperature.*

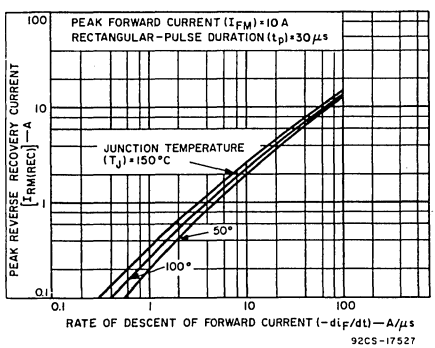



*Fig. 10 — Peak reverse-recovery current vs. rate of descent of forward current.*

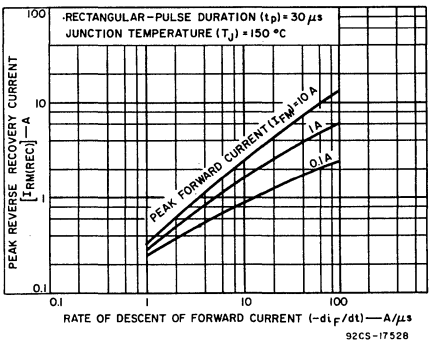



*Fig. 11 – Peak reverse-recovery current vs. rate of descent of forward current.*

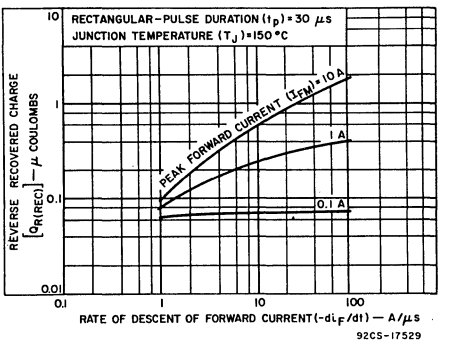



*Fig. 12 – Reverse-recovered charge vs. rate of descent of forward current.*

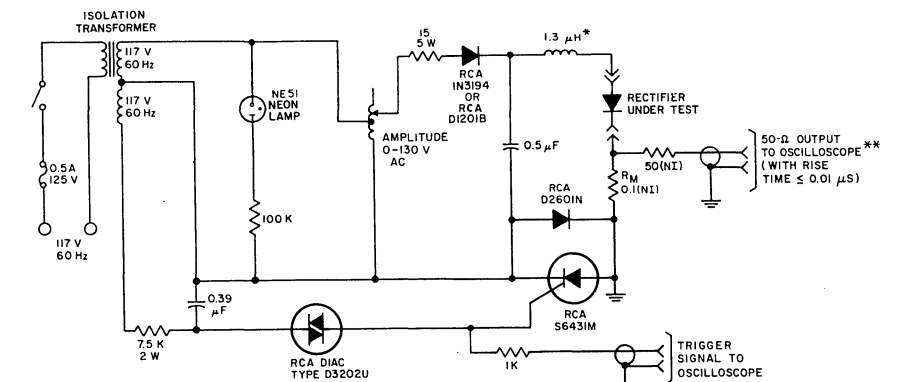



*Fig. 13 – Test circuit (pulsed sine wave) for measurement of reverse-recovery time.*

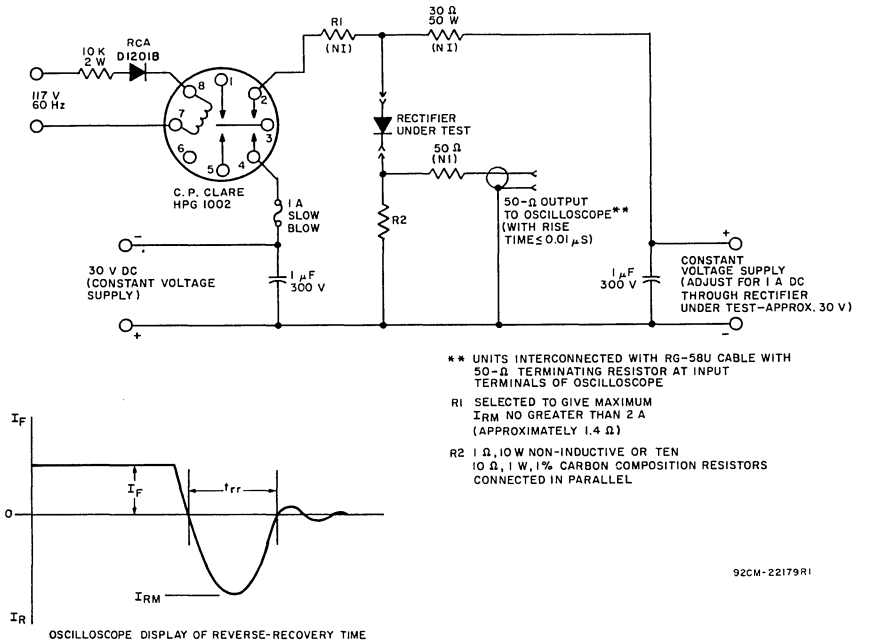



*Fig. 14 — Test circuit (pulsed dc) for measurement of reverse-recovery time.*