

2N3654, 2N3655, 2N3656, 2N3657, 2N3658, S7412M

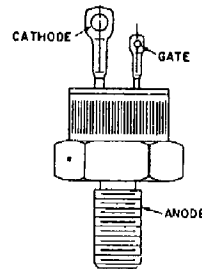
35-A Silicon Controlled Rectifiers

For Inverter Applications

Features:

- Fast turn-off time — 10 μ s max.
- High di/dt and dv/dt capability
- Low thermal resistance

TERMINAL DESIGNATIONS



JEDEC TO-208AA

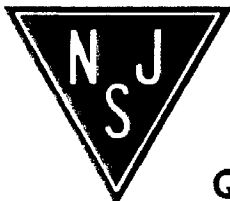
The 2N3654 to 2N3658 have forward and reverse off-state voltage ratings of 50, 100, 200, 300, and 400 volts, respectively. Type S7412M has a forward and reverse off-state voltage rating of 600 volts.

These SCR's employ a hermetic JEDEC TO-208AA package.

MAXIMUM RATINGS, Absolute-Maximum Values:

| | 2N3654 | 2N3655 | 2N3656 | 2N3657 | 2N3658 | S7412M | | |
|---|--------|--------|--------|--------|--------|--------|------------|------------|
| *V _{RSOM} † | 75 | 150 | 300 | 400 | 500 | 700 | V | |
| V _{OSOM} † | 75 | 150 | 300 | 400 | 500 | 700 | V | |
| *V _{RRM} † | 50 | 100 | 200 | 300 | 400 | 600 | V | |
| *V _{ORM} † | 50 | 100 | 200 | 300 | 400 | 600 | V | |
| I _{TRMS} (T _C = 40°C, $\theta = 180^\circ$) | | | | | | | 35 | A |
| I _{TRAV} (T _C = 40°C, $\theta = 180^\circ$) | | | | | | | 25 | A |
| *I _{TM} : For one full cycle of applied principal voltage 60-Hz (Rectangular wave-pw = 5 ms, t _r = 50 μ s), T _C = 40°C | | | | | | | 180 | A |
| *di/dt: V _O = V _{ORM} , I _{GT} = 200 mA, t _r = 0.1 μ s (See Fig. 15) | | | | | | | 400 | A/ μ s |
| z _t : T _J = -65 to 120°C, t = 1 to 8.3 ms | | | | | | | 165 | A2s |
| *P _{OM} †: Peak (forward or reverse) for 10 μ s maximum, See Fig. 7) | | | | | | | 40 | W |
| *P _{AVG} †: Averaging time = 10 ms maximum | | | | | | | 1 | W |
| *T _{stg} * | | | | | | | -65 to 150 | °C |
| *T _C * | | | | | | | -65 to 120 | °C |
| T _F : During soldering for 10 s maximum (terminal and case) | | | | | | | 225 | °C |
| r _s : Recommended | | | | | | | 35 | in-lbf |
| Maximum (DO NOT EXCEED) | | | | | | | 0.4 | kgf-m |
| | | | | | | | 50 | in-lbf |
| | | | | | | | 0.57 | kgf-m |

* In accordance with JEDEC registration data format (JS-14, RDF-1) filed for the JEDEC (2N series) types.
† These values do not apply if there is a positive gate signal. Gate must be open or negatively biased.
■ Any product of gate current and gate voltage which results in a gate power less than the maximum is permitted.
• For temperature measurement reference point, see Dimensional Outline.



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

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ELECTRICAL CHARACTERISTICS

At Maximum Ratings Unless Otherwise Specified and at Indicated Case Temperature (T_C)

| CHARACTERISTIC | LIMITS | | | UNITS |
|---|--------------------------------------|------|-------|---------------------------|
| | FOR ALL TYPES Except as Specified | | | |
| | MIN. | TYP. | MAX. | |
| I_{DOM} or I_{ROM} : $V_D = V_{DROM}$ or $V_R = V_{RROM}$, $T_C = 120^\circ\text{C}$ 2N3654, 2N3655, 2N3656, S7412M 2N3657 2N3658 | - | 2 | 6* | mA |
| | - | 2 | 5.5* | |
| | - | 2 | 4* | |
| | - | 2 | 4* | |
| v_T : $i_T = 25\text{ A (peak)}$, $T_C = 25^\circ\text{C}$ | - | 1.5 | 2.05* | V |
| i_{HO} : $T_C = 25^\circ\text{C}$ $T_C = -65^\circ\text{C}$ | - | 75 | 150 | mA |
| | - | 150 | 350* | |
| dv/dt : $V_D = V_{DROM}$, exponential voltage rise, $T_C = 120^\circ\text{C}$ (See Fig. 16) | 200 | - | - | V/ μs |
| I_{GT} : $V_D = 6\text{ V (dc)}$, $R_L = 4\ \Omega$, $T_C = 25^\circ\text{C}$ $V_D = 6\text{ V (dc)}$, $R_L = 2\ \Omega$, $T_C = -65^\circ\text{C}$ | - | 80 | 180 | mA |
| | - | 150 | 500* | |
| V_{GT} : $V_D = 6\text{ V (dc)}$, $R_L = 4\ \Omega$, $T_C = 25^\circ\text{C}$ $V_D = 6\text{ V (dc)}$, $R_L = 200\ \Omega$, $T_C = 120^\circ\text{C}$ $V_D = 6\text{ V (dc)}$, $R_L = 2\ \Omega$, $T_C = -65^\circ\text{C}$ | - | 1.5 | 3 | V |
| | 0.25 | - | - | |
| | - | 2 | 4.5* | |
| t_q : Rectangular Pulse $V_{DX} = V_{DROM}$, $i_T = 10\text{ A}$, pulse duration = $50\ \mu\text{s}$, $dv/dt = 200\text{ V}/\mu\text{s}$, $-di/dt = 5\text{ A}/\mu\text{s}$, $I_{GT} = 200\text{ mA}$ at turn-on, $V_{RX} = 15\text{ V}$ minimum, $V_{GK} = 0\text{ V}$ at turn-off, $T_C = 120^\circ\text{C}$ (See Figs. 17 & 18) Sinusoidal Pulse $V_{DX} = V_{DROM}$, $i_T = 100\text{ A}$, pulse duration = $2\ \mu\text{s}$, $dv/dt = 200\text{ V}/\mu\text{s}$, $V_{RX} = 30\text{ V}$ minimum, $V_{GK} = 0$ at turn-off, $T_C = 115^\circ\text{C}$ (See Figs. 19 & 20) | - | - | 10 | μs |
| | - | - | 10 | |
| $R_{\theta JC}$ | - | 0.85 | 1.7* | $^\circ\text{C}/\text{W}$ |

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