

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

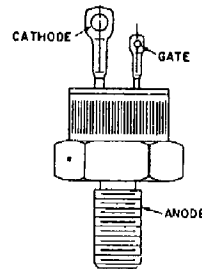
35-A Silicon Controlled Rectifiers

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

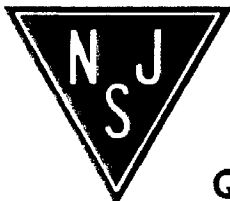
The 2N3654 to 2N3658 have forward and reverse off-state voltage ratings of 50, 100, 200, 300, and 400 volts, respectively. Type S7412M has a forward and reverse off-state voltage rating of 600 volts.

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 _r : During soldering for 10 s maximum (terminal and case)							225	°C
r _s : Recommended							35	in-lbf
							0.4	kgf-m
Maximum (DO NOT EXCEED)							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	—	2	6*	mA
2N3657	—	2	5.5*	
2N3658	—	2	4*	
v_T : $i_T = 25\text{ A (peak)}$, $T_C = 25^\circ\text{C}$	—	1.5	2.05*	
i_{HO} : $T_C = 25^\circ\text{C}$	—	75	150	mA
$T_C = -65^\circ\text{C}$	—	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} : $V_D = 6\text{ V (dc)}$, $R_L = 4\ \Omega$, $T_C = 25^\circ\text{C}$	—	80	180	mA
$V_D = 6\text{ V (dc)}$, $R_L = 2\ \Omega$, $T_C = -65^\circ\text{C}$	—	150	500*	
V_{GT} : $V_D = 6\text{ V (dc)}$, $R_L = 4\ \Omega$, $T_C = 25^\circ\text{C}$	—	1.5	3	V
* $V_D = 6\text{ V (dc)}$, $R_L = 200\ \Omega$, $T_C = 120^\circ\text{C}$	0.25	—	—	
$V_D = 6\text{ V (dc)}$, $R_L = 2\ \Omega$, $T_C = -65^\circ\text{C}$	—	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)	—	—	10	μs
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	
$R_{\theta JC}$	—	0.85	1.7*	$^\circ\text{C}/\text{W}$

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