New Jersey Semi-Conductor Products, Inc.

20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

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

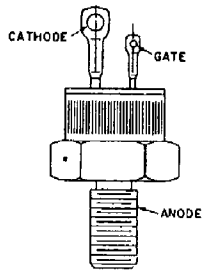
35-A Silicon Controlled Rectifiers

For Inverter Applications

Features:

- *Fast turn-off time — 10 μs 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_{DSOM}†	75	150	300	400	500	700	V
*V_{RROM}†	50	100	200	300	400	600	V
*V_{DROM}†	50	100	200	300	400	600	V
$I_{T(RMS)}$ (T_C = 40°C, θ = 180°)	35						A
*$I_{T(AV)}$ (T_C = 40°C, θ = 180°)	25						A
*I_{TSM}: For one full cycle of applied principal voltage 60-H_z (Rectangular wave-pw = 5 ms, t_r = 50 μs), T_C = 40°C	180						A
*di/dt: V_D = V_{DROM}, I_{GT} = 200 mA, t_r = 0.1 μs (See Fig. 15)	400						A/μs
I^2t: T_J = -65 to 120°C, t = 1 to 8.3 ms	165						A^2s
*P_{GM}■: Peak (forward or reverse) for 10μs maximum, See Fig. 7)	40						W
*$P_{G(AV)}$■: Averaging time = 10 ms maximum	1						W
T_{stg}	-65 to 150						°C
T_C	-65 to 120						°C
T_T: 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.

Quality Semi-Conductors

ELECTRICAL CHARACTERISTICS

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

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

* In accordance with JEDEC registration data format (JS-14, RDF-1) filed for the JEDEC (2N series) types.