2N6344A, 2N6348A, 2N6349A

Preferred Device

Triacs

Silicon Bidirectional Thyristors

Designed primarily for full-wave AC control applications, such as light dimmers, motor controls, heating controls and power supplies; or wherever full-wave silicon gate controlled solid-state devices are needed. Triac type thyristors switch from a blocking to a conducting state for either polarity of applied anode voltage with positive or negative gate triggering.

Features

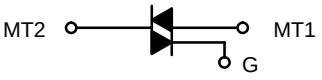
- Blocking Voltage to 800 V
- All Diffused and Glass Passivated Junctions for Greater Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal Resistance, High Heat Dissipation and Durability
- Gate Triggering Guaranteed in all Four Quadrants
- For 400 Hz Operation, Consult Factory
- 8.0 A Devices Available as 2N6344 thru 2N6349
- Pb−Free Packages are Available*

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

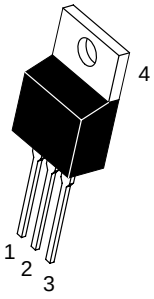
ON Semiconductor®

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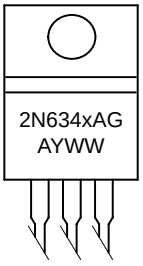
TRIACS
12 AMPERES RMS
600 thru 800 VOLTS



MARKING DIAGRAM



TO−220AB
CASE 221A
STYLE 4



2N634xA = Device Code
x = 4, 8, or 9
A = Assembly Location
Y = Year
WW = Work Week
G = Pb−Free Package

PIN ASSIGNMENT	
1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	Main Terminal 2

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

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MAXIMUM RATINGS

Characteristics	Symbol	Value	Unit
*Peak Repetitive Off−State Voltage (Note 1) (Gate Open, T_J = −40 to +110°C, Sine Wave 50 to 60 Hz, Gate Open) 2N6344A, 2N6348A 2N6349A	V_{DRM}, V_{RRM}	 600 800	V
*On−State RMS Current (Full Cycle Sine Wave 50 to 60 Hz) (T_C = +80°C) (T_C = +95°C)	$I_{T(RMS)}$	 12 6.0	A
*Peak Non−repetitive Surge Current (One Full Cycle, 60 Hz, T_C = +80°C) Preceded and followed by rated current	I_{TSM}	100	A
Circuit Fusing Consideration (t = 8.3 ms)	I^2t	59	A^2s
*Peak Gate Power (T_C = +80°C, Pulse Width = 2.0 μs)	P_{GM}	20	W
*Average Gate Power (T_C = +80°C, t = 8.3 ms)	$P_{G(AV)}$	0.5	W
*Peak Gate Current (Pulse Width = 2.0 μs; T_C = +80°C)	I_{GM}	2.0	A
*Peak Gate Voltage (Pulse Width = 2.0 μs; T_C = +80°C)	V_{GM}	±10	V
*Operating Junction Temperature Range	T_J	−40 to +125	°C
*Storage Temperature Range	T_{stg}	−40 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

*Indicates JEDEC Registered Data.

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	2.0	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8″ from Case for 10 Seconds	T_L	260	°C

ORDERING INFORMATION

Device	Package	Shipping
2N6344A	TO−220AB	500 Units / Box
2N6344AG	TO−220AB (Pb−Free)	
2N6348A	TO−220AB	
2N6348AG	TO−220AB (Pb−Free)	
2N6349A	TO−220AB	
2N6349AG	TO−220AB (Pb−Free)	

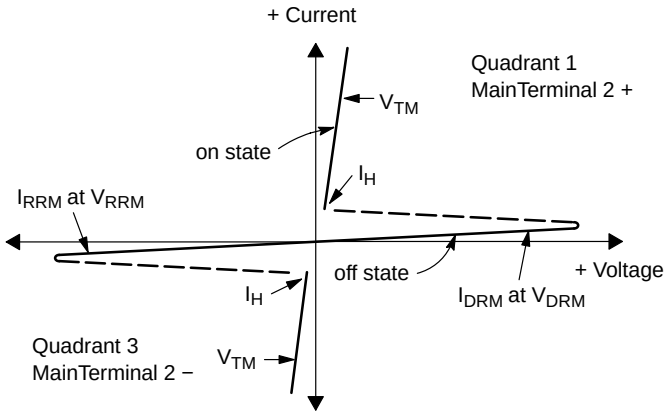
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted; Electricals apply in either direction)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
*Peak Repetitive Blocking Current (V_D = Rated V_{DRM}, V_{RRM}; Gate Open)	T_J = 25°C	I_{DRM}, I_{RRM}	–	–	10	μA
	T_J = 110°C		–	–	2.0	mA
ON CHARACTERISTICS						
*Peak On-State Voltage (I_{TM} = ±17 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2%)		V_{TM}	–	1.3	1.75	V
Gate Trigger Current (Continuous dc) (V_D = 12 Vdc, R_L = 100 Ω)		I_{GT}				mA
Quadrant I: MT2(+), G(+)	All		–	6.0	50	
Quadrant II: MT2(+), G(−)	2N6348A and 2N6349A only		–	6.0	75	
Quadrant III: MT2(−), G(−)	All		–	10	50	
Quadrant IV: MT2(−), G(+)	2N6348A and 2N6349A only		–	25	75	
*MT2(+), G(+); MT2(−), G(−) T_C = −40°C			–	–	100	
*MT2(+), G(−); MT2(−), G(+) T_C = −40°C			–	–	125	
Gate Trigger Voltage (Continuous dc) (V_D = 12 Vdc, R_L = 100 Ω)		V_{GT}				V
Quadrant I: MT2(+), G(+)	All		–	0.9	2.0	
Quadrant II: MT2(+), G(−)	2N6348A and 2N6349A only		–	0.9	2.5	
Quadrant III: MT2(−), G(−)	All		–	1.1	2.0	
Quadrant IV: MT2(−), G(+)	2N6348A and 2N6349A only		–	1.4	2.5	
*MT2(+), G(+); MT2(−), G(−) T_C = −40°C			–	–	2.5	
*MT2(+), G(−); MT2(−), G(+) T_C = −40°C			–	–	3.0	
Gate Non−Trigger Voltage (V_D = Rated V_{DRM}, R_L = 10 k Ω, T_J = 110°C) *MT2(+), G(+); MT2(−), G(−); MT2(+), G(−); MT2(−), G(+)		V_{GD}	0.2	–	–	V
Holding Current (V_D = 12 Vdc, Gate Open) Initiating Current = ±200 mA	T_C = 25°C	I_H	–	6.0	40	mA
	*T_C = −40°C		–	–	75	
*Turn-On Time (V_D = Rated V_{DRM}, I_{TM} = 17 A, I_{GT} = 120 mA, Rise Time = 0.1 μs, Pulse Width = 2 μs)		t_{gt}	–	1.5	2.0	μs
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of Commutation Voltage (V_D = Rated V_{DRM}, I_{TM} = 17 A, Commutating di/dt = 6.1 A/ms, Gate Unenergized, T_C = 80°C)		dv/dt(c)	–	5.0	–	V/μs

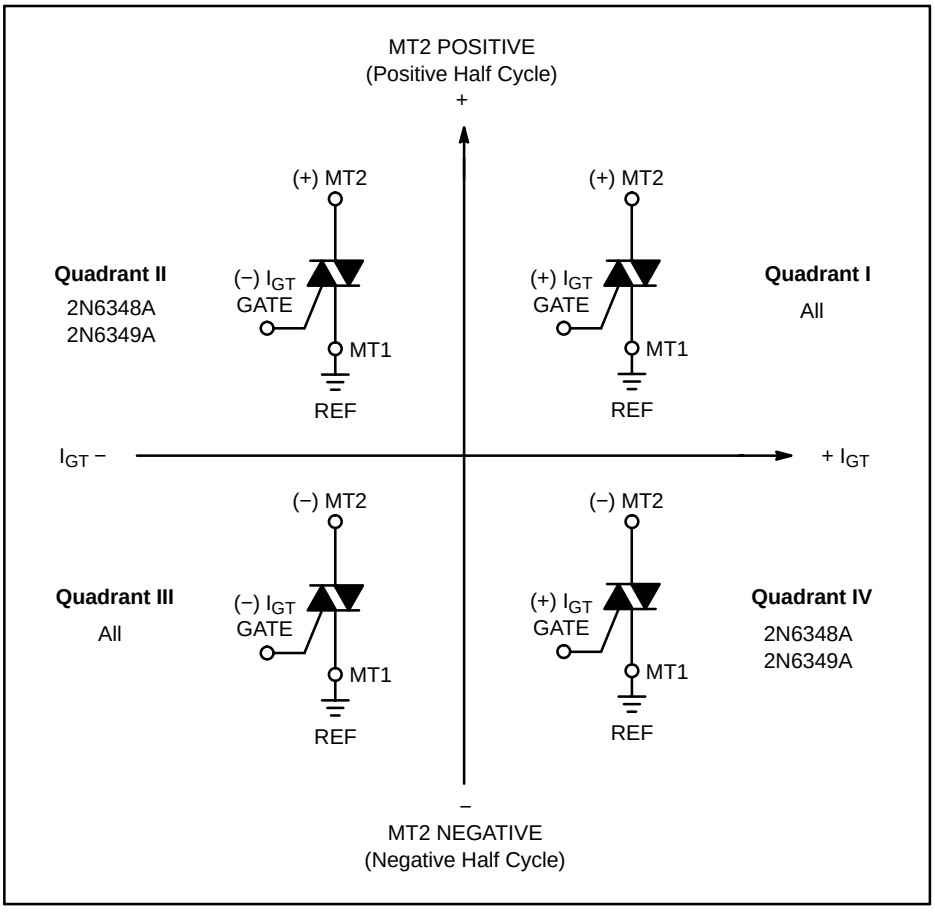
*Indicates JEDEC Registered Data.

Voltage Current Characteristic of Triacs (Bidirectional Device)

Symbol	Parameter
V_{DRM}	Peak Repetitive Forward Off State Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Reverse Off State Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Maximum On State Voltage
I_H	Holding Current



Quadrant Definitions for a Triac



All polarities are referenced to MT1.
With in−phase signals (using standard AC lines) quadrants I and III are used.

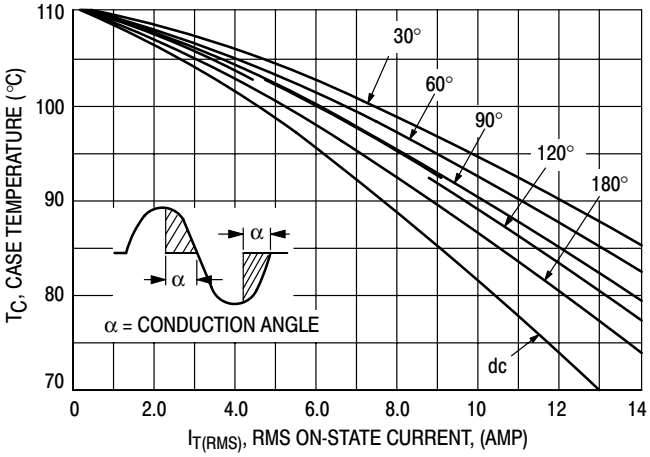


Figure 1. RMS Current Derating

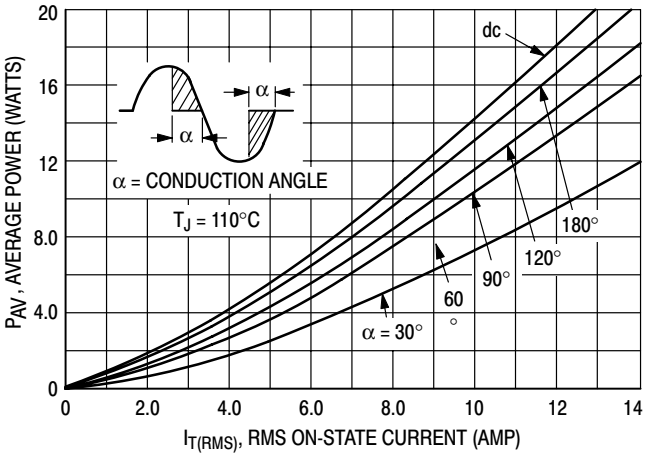


Figure 2. On−State Power Dissipation

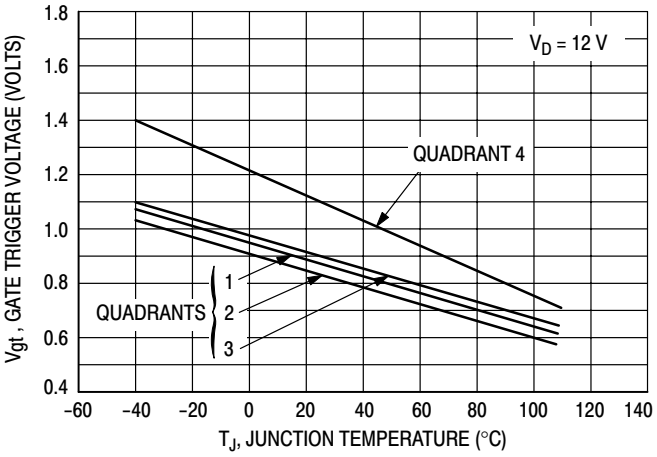


Figure 3. Typical Gate Trigger Voltage

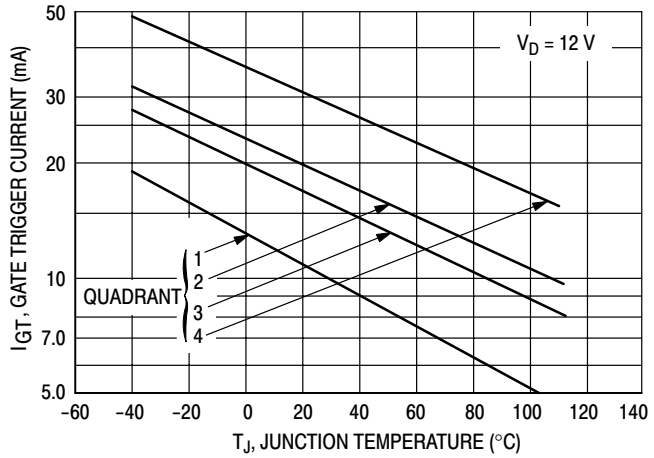


Figure 4. Typical Gate Trigger Current

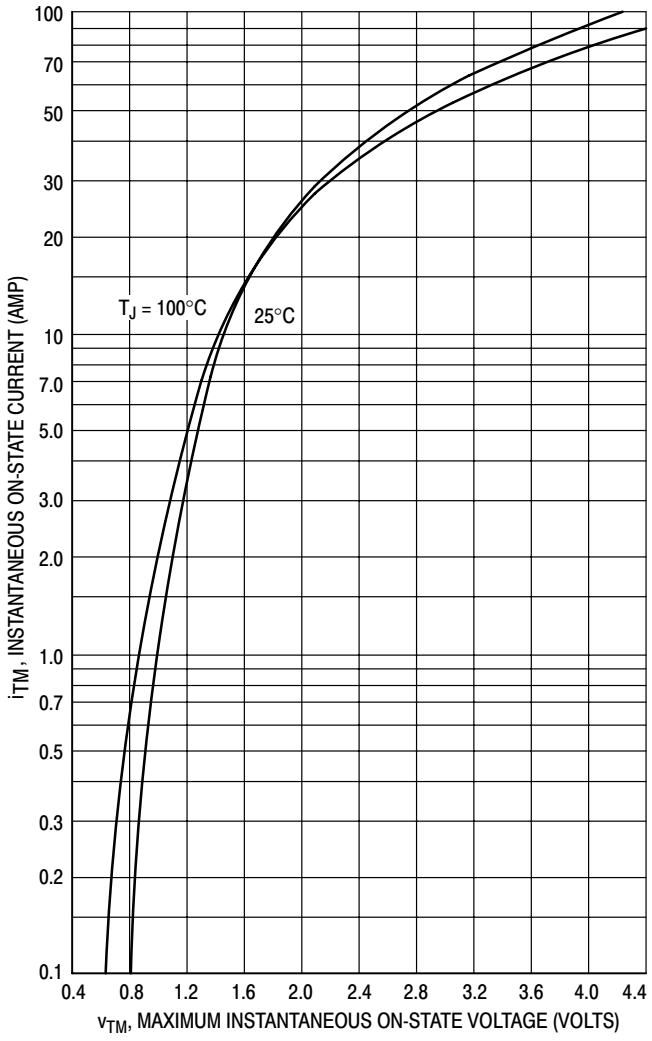


Figure 5. On−State Characteristics

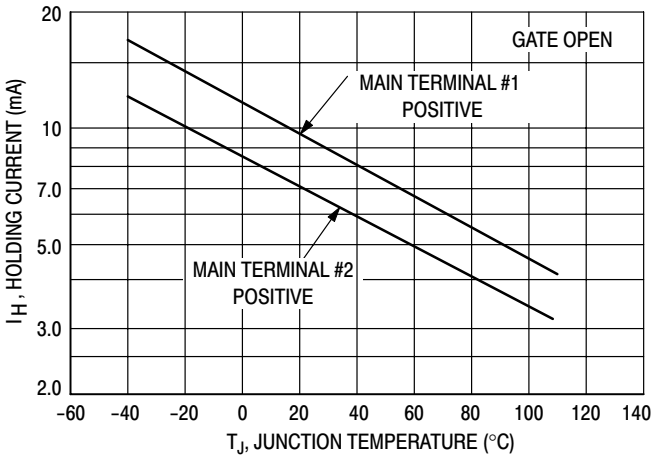


Figure 6. Typical Holding Current

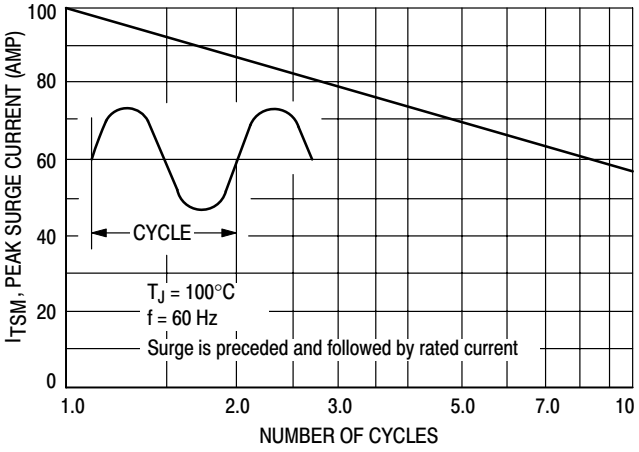


Figure 7. Maximum Non−Repetitive Surge Current

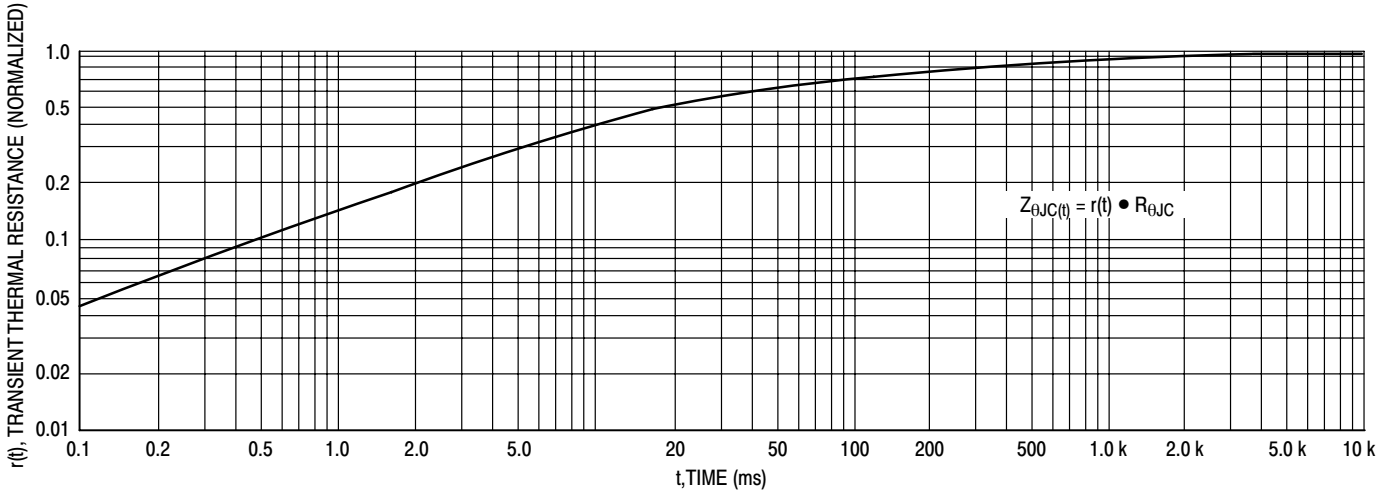
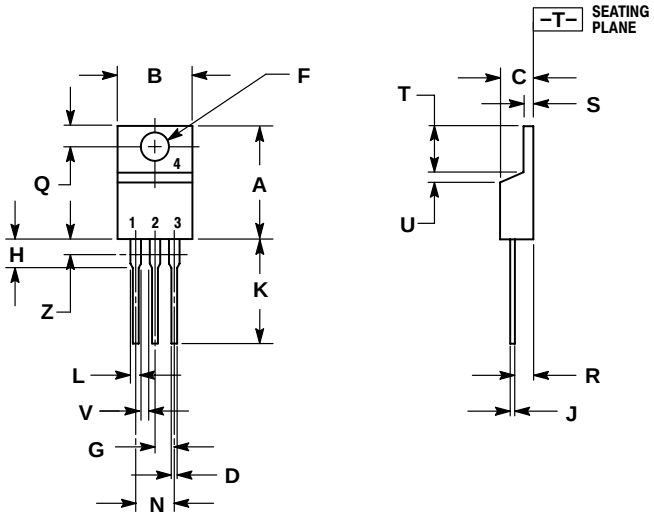


Figure 8. Typical Thermal Response

PACKAGE DIMENSIONS

TO−220AB
CASE 221A−07
ISSUE AA



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

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