

2N6344, 2N6349

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 main terminal voltage with positive or negative gate triggering.

- Blocking Voltage to 800 Volts
- 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
- Device Marking: Logo, Device Type, e.g., 2N6344, Date Code

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
*Peak Repetitive Off-State Voltage ⁽¹⁾ ($T_J = -40$ to $+110^\circ\text{C}$, Sine Wave 50 to 60 Hz, Gate Open) 2N6344 2N6349	V_{DRM} , V_{RRM}	600 800	Volts
*On-State RMS Current ($T_C = +80^\circ\text{C}$) Full Cycle Sine Wave 50 to 60 Hz ($T_C = +90^\circ\text{C}$)	$I_{\text{T(RMS)}}$	8.0 4.0	Amps
*Peak Non-Repetitive Surge Current (One Full Cycle, Sine Wave 60 Hz, $T_C = +25^\circ\text{C}$) Preceded and followed by rated current	I_{TSM}	100	Amps
Circuit Fusing Consideration ($t = 8.3$ ms)	I^2t	40	A^2s
*Peak Gate Power ($T_C = +80^\circ\text{C}$, Pulse Width = 2 μs)	P_{GM}	20	Watts
*Average Gate Power ($T_C = +80^\circ\text{C}$, $t = 8.3$ ms)	$P_{\text{G(AV)}}$	0.5	Watt
*Peak Gate Current ($T_C = +80^\circ\text{C}$, Pulse Width = 2.0 μs)	I_{GM}	2.0	Amps
*Peak Gate Voltage ($T_C = +80^\circ\text{C}$, Pulse Width = 2.0 μs)	V_{GM}	10	Volts
*Operating Junction Temperature Range	T_J	-40 to $+125$	$^\circ\text{C}$
*Storage Temperature Range	T_{Stg}	-40 to $+150$	$^\circ\text{C}$

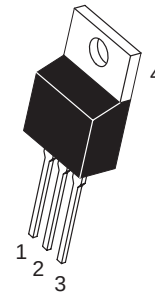
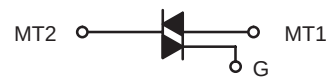
(1) V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.



ON Semiconductor

<http://onsemi.com>

TRIACS
8 AMPERES RMS
600 thru 800 VOLTS



TO-220AB
CASE 221A
STYLE 4

PIN ASSIGNMENT

1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	Main Terminal 2

ORDERING INFORMATION

Device	Package	Shipping
2N6344	TO220AB	500/Box
2N6349	TO220AB	500/Box

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

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	T_L	260	°C

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted; Electricals apply in both directions)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

* Peak Repetitive Blocking Current ($V_D = \text{Rated } V_{DRM}, V_{RRM}$; Gate Open)	I_{DRM}, I_{RRM}	—	—	10	μA
$T_J = 25^\circ\text{C}$ $T_J = 100^\circ\text{C}$		—	—	2.0	mA

ON CHARACTERISTICS

* Peak On-State Voltage ($I_{TM} = \pm 11\text{ A Peak}$; Pulse Width = 1 to 2 ms, Duty Cycle $\leq 2\%$)	V_{TM}	—	1.3	1.55	Volts
Gate Trigger Current (Continuous dc) ($V_D = 12\text{ Vdc}$, $R_L = 100\text{ Ohms}$)	I_{GT}				mA
MT2(+), G(+)		—	12	50	
MT2(+), G(—)		—	12	75	
MT2(—), G(—)		—	20	50	
MT2(—), G(+)		—	35	75	
*MT2(+), G(+); MT2(—), G(—) $T_C = -40^\circ\text{C}$		—	—	100	
*MT2(+), G(—); MT2(—), G(+), $T_C = -40^\circ\text{C}$		—	—	125	
Gate Trigger Voltage (Continuous dc) ($V_D = 12\text{ Vdc}$, $R_L = 100\text{ Ohms}$)	V_{GT}				Volts
MT2(+), G(+)		—	0.9	2.0	
MT2(+), G(—)		—	0.9	2.5	
MT2(—), G(—)		—	1.1	2.0	
MT2(—), G(+)		—	1.4	2.5	
*MT2(+), G(+); MT2(—), G(—) $T_C = -40^\circ\text{C}$		—	—	2.5	
*MT2(+), G(—); MT2(—), G(+), $T_C = -40^\circ\text{C}$		—	—	3.0	
Gate Non-Trigger Voltage (Continuous dc) ($V_D = \text{Rated } V_{DRM}$, $R_L = 10\text{ k Ohms}$, $T_J = 100^\circ\text{C}$)	V_{GD}				Volts
*MT2(+), G(+); MT2(—), G(—); MT2(+), G(—); MT2(—), G(—)		0.2	—	—	
* Holding Current ($V_D = 12\text{ Vdc}$, Gate Open)	I_H				mA
(Initiating Current = $\pm 200\text{ mA}$)		—	6.0	40	
$T_C = 25^\circ\text{C}$ * $T_C = -40^\circ\text{C}$		—	—	75	
* Turn-On Time ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 11\text{ A}$, $I_{GT} = 120\text{ mA}$, Rise Time = $0.1\text{ }\mu\text{s}$, Pulse Width = $2\text{ }\mu\text{s}$)	t_{gt}	—	1.5	2.0	μs

DYNAMIC CHARACTERISTICS

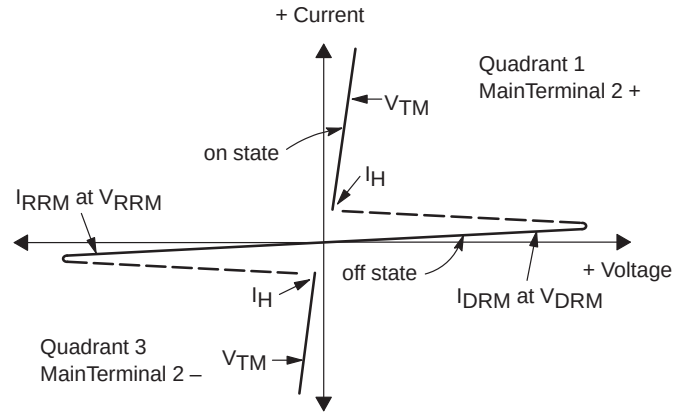
Critical Rate of Rise of Commutation Voltage ($V_D = \text{Rated } V_{DRM}$, $I_{TM} = 11\text{ A}$, Commutating $di/dt = 4.0\text{ A/ms}$, Gate Unenergized, $T_C = 80^\circ\text{C}$)	$dv/dt(c)$	—	5.0	—	V/ μs
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*Indicates JEDEC Registered Data.

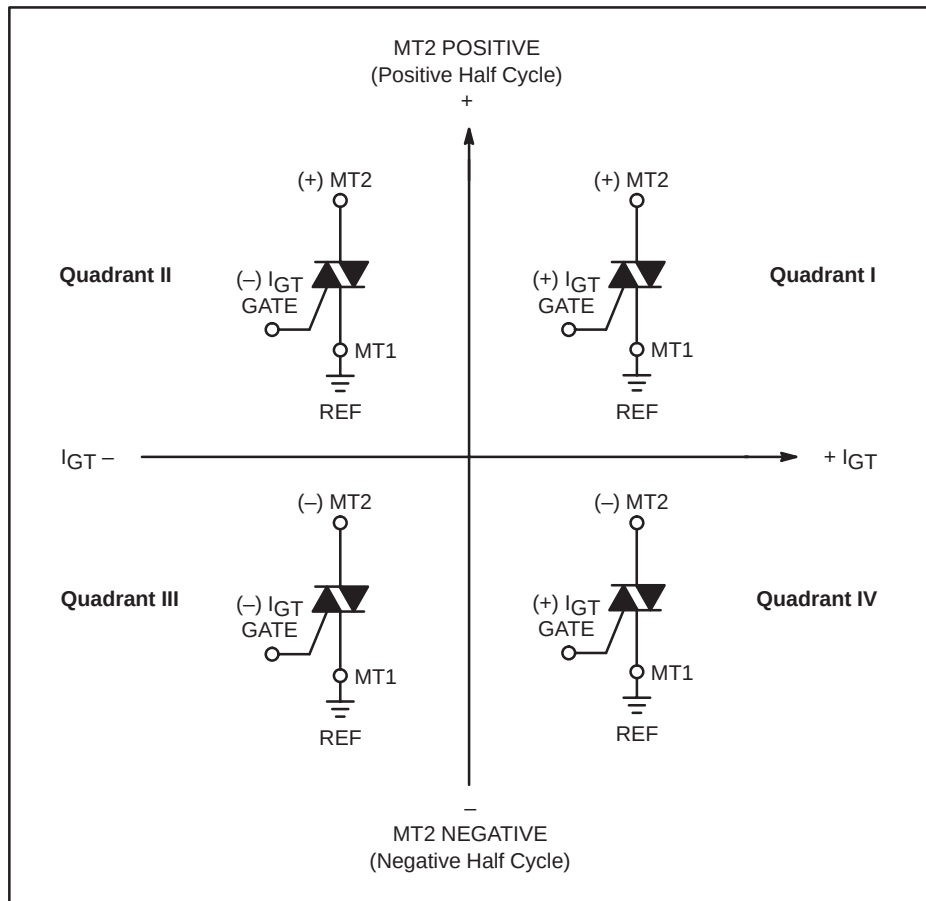
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Voltage Current Characteristic of Triacs (Bidirectional Device)

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.

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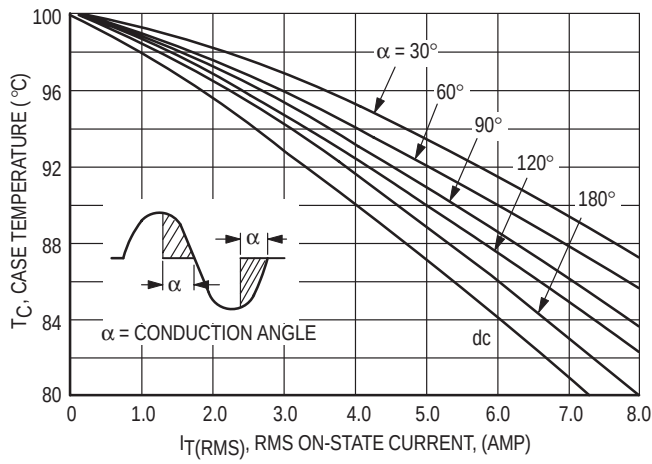


Figure 1. RMS Current Derating

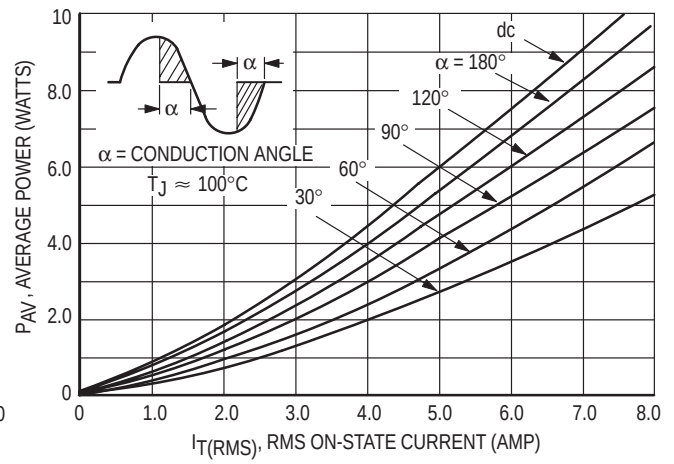


Figure 2. On-State Power Dissipation

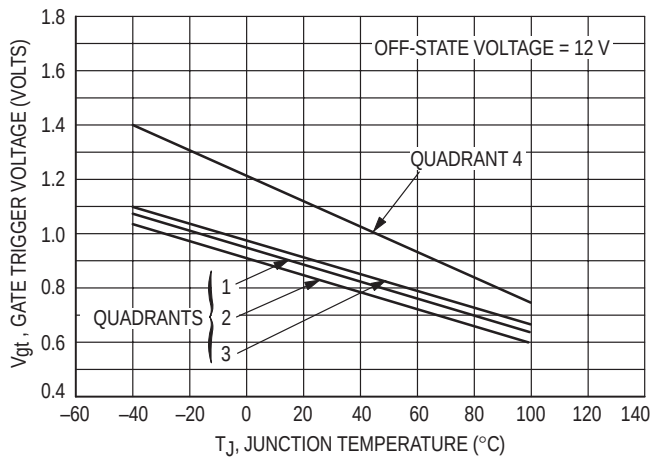


Figure 3. Typical Gate Trigger Voltage

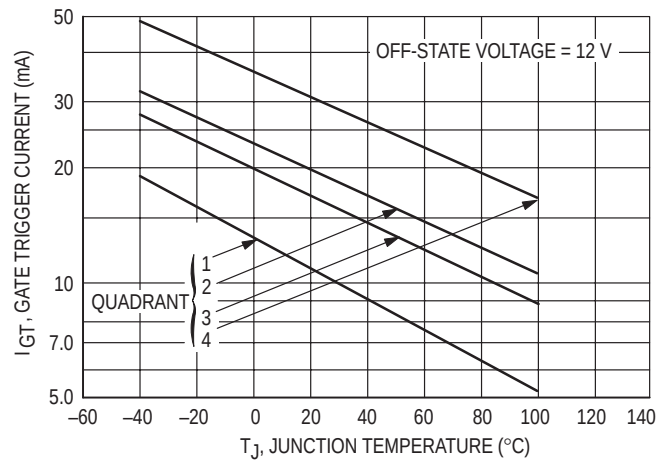


Figure 4. Typical Gate Trigger Current

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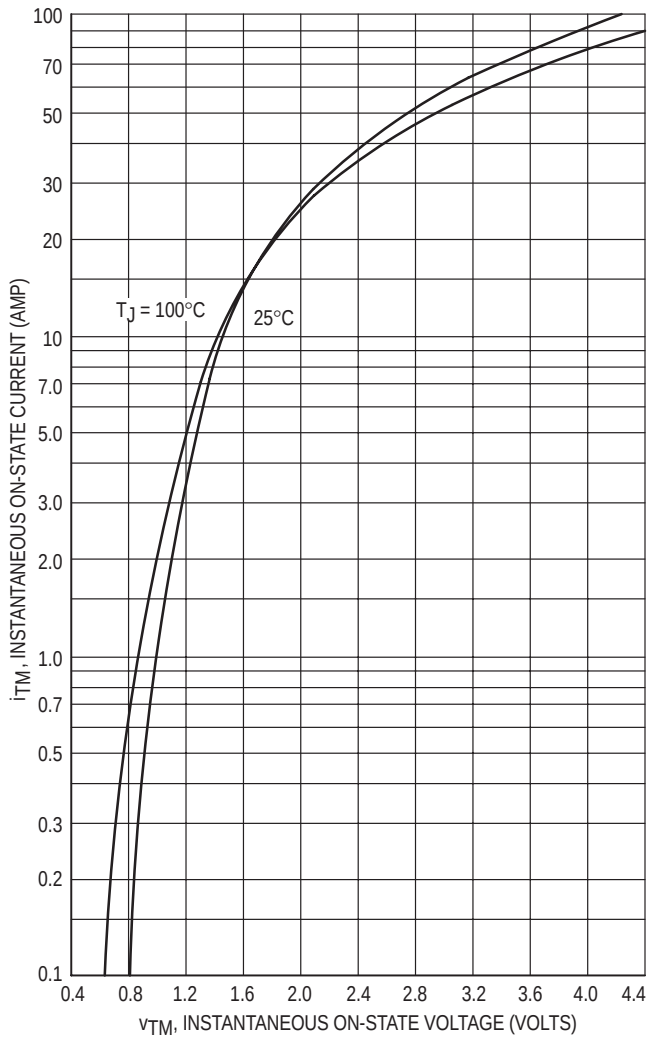


Figure 5. On-State Characteristics

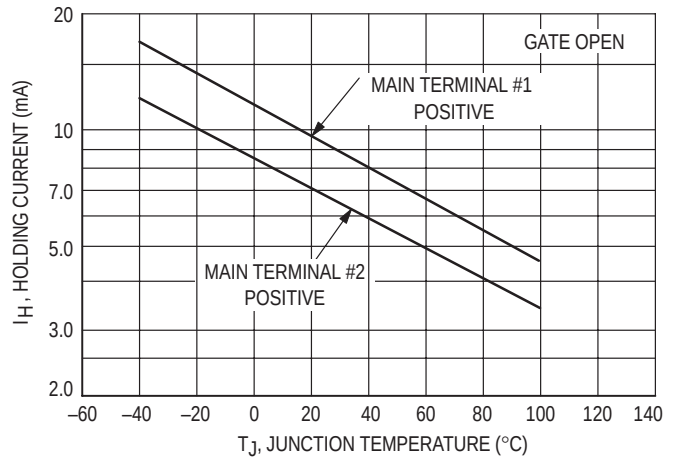


Figure 6. Typical Holding Current

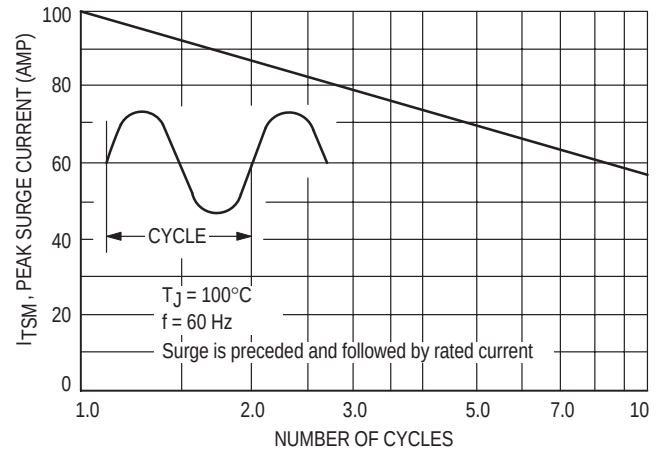


Figure 7. Maximum Non-Repetitive Surge Current

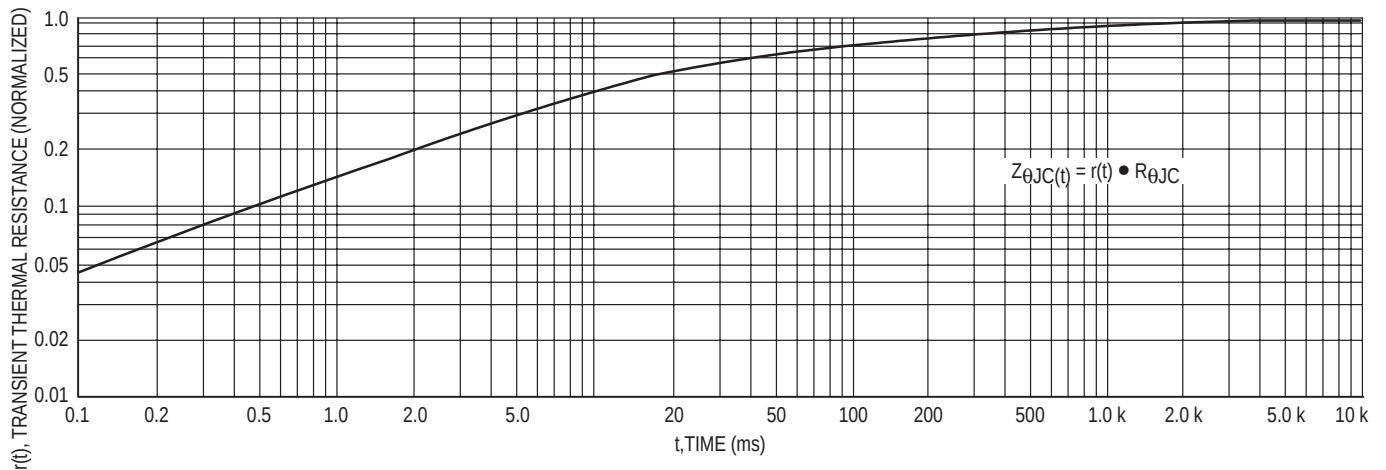
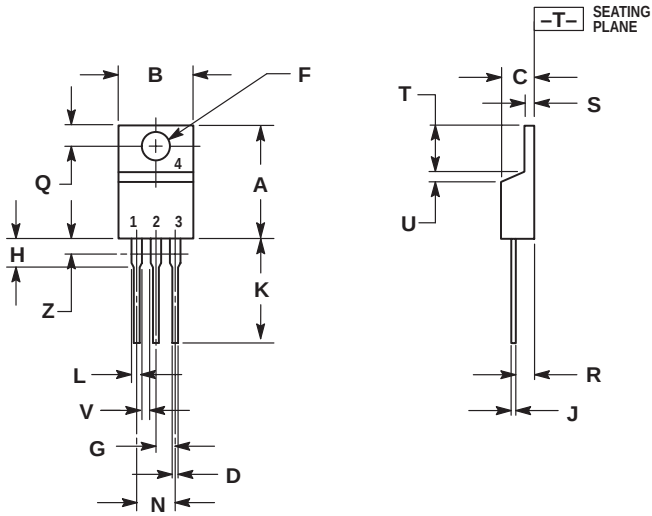


Figure 8. Typical Thermal Response

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PACKAGE DIMENSIONS

TO-220AB CASE 221A-07 ISSUE Z



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.

DIM	INCHES		MILLIMETERS	
	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
O	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
- MAIN TERMINAL 2
- GATE
- MAIN TERMINAL 2

Notes

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