

# 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.

- 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
- 8 Ampere Devices Available as 2N6344 thru 2N6349
- Device Marking: Logo, Device Type, e.g., 2N6344A, Date Code

#### MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
*Peak Repetitive Off-State Voltage <sup>(1)</sup> (Gate Open, T <sub>J</sub> = -40 to +110°C, Sine Wave 50 to 60 Hz, Gate Open) 2N6344A, 2N6348A 2N6349A	V <sub>DRM</sub> , V <sub>RRM</sub>	600 800	Volts
*On-State RMS Current (Full Cycle Sine Wave 50 to 60 Hz) (T <sub>C</sub> = +80°C) (T <sub>C</sub> = +95°C)	I <sub>T(RMS)</sub>	12 6.0	A
*Peak Non-repetitive Surge Current (One Full Cycle, 60 Hz, T <sub>C</sub> = +80°C) Preceded and followed by rated current	I <sub>TSM</sub>	100	A
Circuit Fusing Consideration (t = 8.3 ms)	I <sup>2</sup> t	59	A <sup>2</sup> s
*Peak Gate Power (T <sub>C</sub> = +80°C, Pulse Width = 2.0 μs)	P <sub>GM</sub>	20	Watts
*Average Gate Power (T <sub>C</sub> = +80°C, t = 8.3 ms)	P <sub>G(AV)</sub>	0.5	Watt
*Peak Gate Current (Pulse Width = 2.0 μs; T <sub>C</sub> = +80°C)	I <sub>GM</sub>	2.0	A
*Peak Gate Voltage (Pulse Width = 2.0 μs; T <sub>C</sub> = +80°C)	V <sub>GM</sub>	± 10	Volts
*Operating Junction Temperature Range	T <sub>J</sub>	-40 to +125	°C
*Storage Temperature Range	T <sub>stg</sub>	-40 to +150	°C

\*Indicates JEDEC Registered Data.

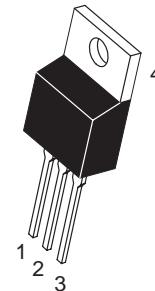
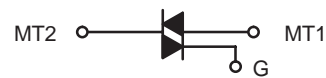
(1) V<sub>DRM</sub> and V<sub>RRM</sub> for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.



ON Semiconductor

<http://onsemi.com>

**TRIACS**  
**12 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
2N6344A	TO220AB	500/Box
2N6348A	TO220AB	500/Box
2N6349A	TO220AB	500/Box

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

## 2N6344A, 2N6348A, 2N6349A

## 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

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

Characteristic	Symbol	Min	Typ	Max	Unit
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## OFF CHARACTERISTICS

*Peak Repetitive Blocking Current ( $V_D = \text{Rated } V_{DRM}, V_{RRM}; \text{ Gate Open}$ )	$I_{DRM}, I_{RRM}$	—	—	10	$\mu\text{A}$
$T_J = 25^\circ\text{C}$		—	—	2.0	mA
$T_J = 110^\circ\text{C}$		—	—		

## ON CHARACTERISTICS

*Peak On-State Voltage ( $I_{TM} = \pm 17 \text{ A Peak}; \text{ Pulse Width} = 1 \text{ to } 2 \text{ ms}, \text{ Duty Cycle} \leq 2\%$ )	$V_{TM}$	—	1.3	1.75	Volts
Gate Trigger Current (Continuous dc) ( $V_D = 12 \text{ Vdc}, R_L = 100 \text{ Ohms}$ )	$I_{GT}$				mA
MT2(+), G(+)		—	6.0	50	
MT2(+), G(-)		—	6.0	75	
MT2(-), G(-)		—	10	50	
MT2(-), G(+)		—	25	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 ( $V_D = \text{Rated } V_{DRM}, R_L = 10 \text{ k ohms}, T_J = 110^\circ\text{C}$ )	$V_{GD}$				Volts
*MT2(+), G(+); MT2(-), G(-); MT2(+), G(-); MT2(-), G(+)		0.2	—	—	
Holding Current ( $V_D = 12 \text{ Vdc}, \text{ Gate Open}$ )	$I_H$				mA
Initiating Current = $\pm 200 \text{ mA}$		—	6.0	40	
$T_C = 25^\circ\text{C}$		—	—	75	
* $T_C = -40^\circ\text{C}$		—	—		
*Turn-On Time ( $V_D = \text{Rated } V_{DRM}, I_{TM} = 17 \text{ A}, I_{GT} = 120 \text{ mA},$ Rise Time = $0.1 \mu\text{s}$ , Pulse Width = $2 \mu\text{s}$ )	$t_{gt}$	—	1.5	2.0	$\mu\text{s}$

## DYNAMIC CHARACTERISTICS

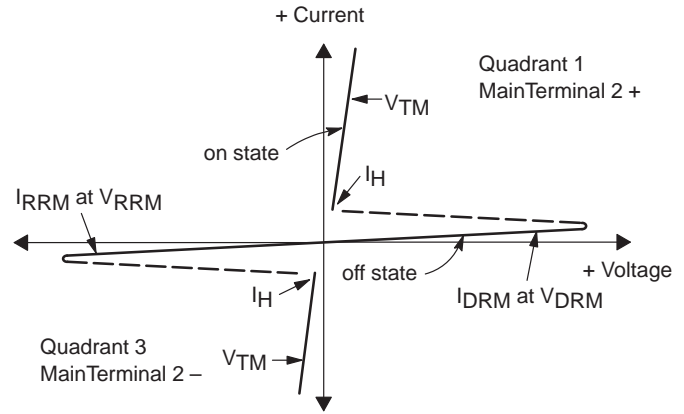
Critical Rate of Rise of Commutation Voltage ( $V_D = \text{Rated } V_{DRM}, I_{TM} = 17 \text{ A}, \text{ Commutating } di/dt = 6.1 \text{ A/ms},$ Gate Unenergized, $T_C = 80^\circ\text{C}$ )	$dv/dt(c)$	—	5.0	—	$\text{V}/\mu\text{s}$
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\*Indicates JEDEC Registered Data.

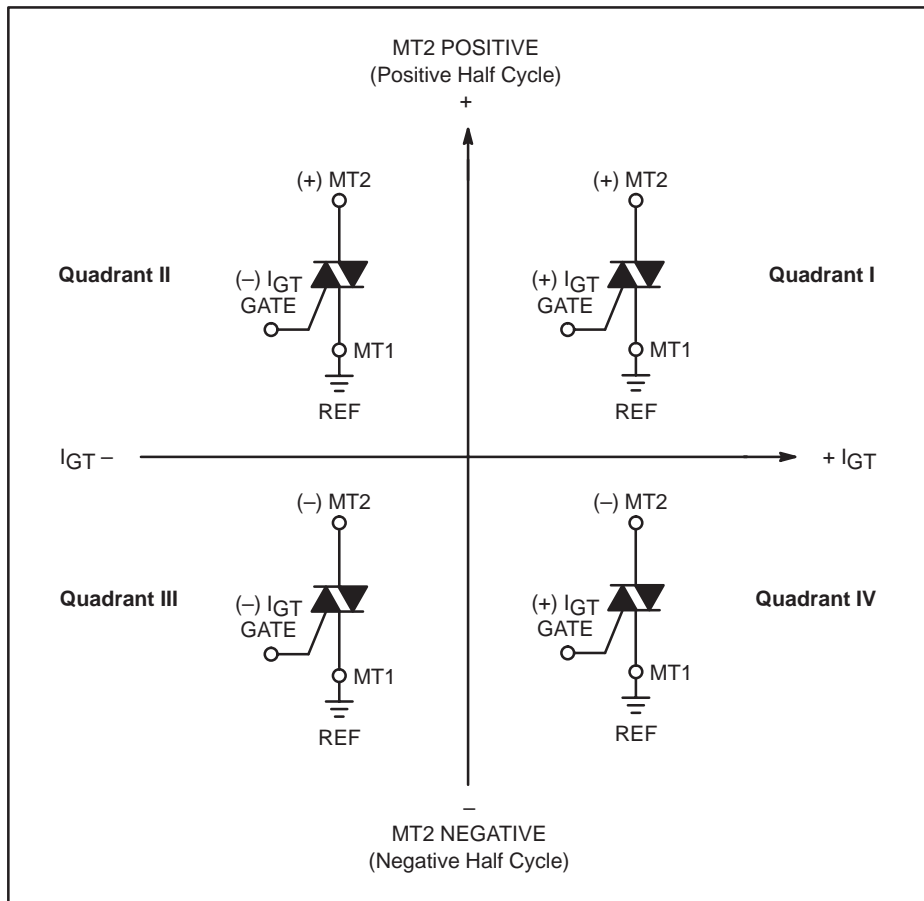
## 2N6344A, 2N6348A, 2N6349A

### 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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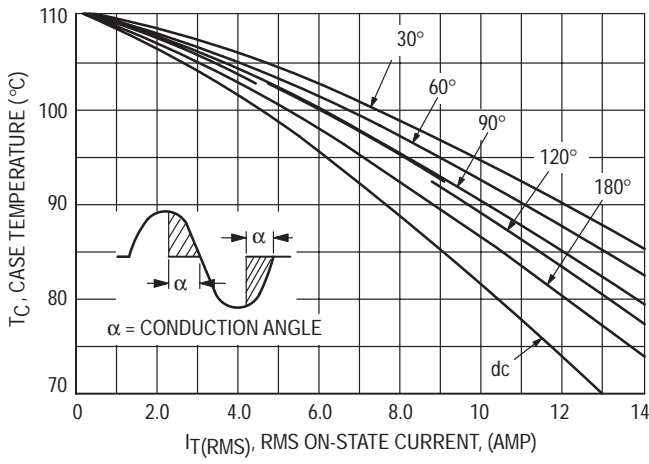


Figure 1. RMS Current Derating

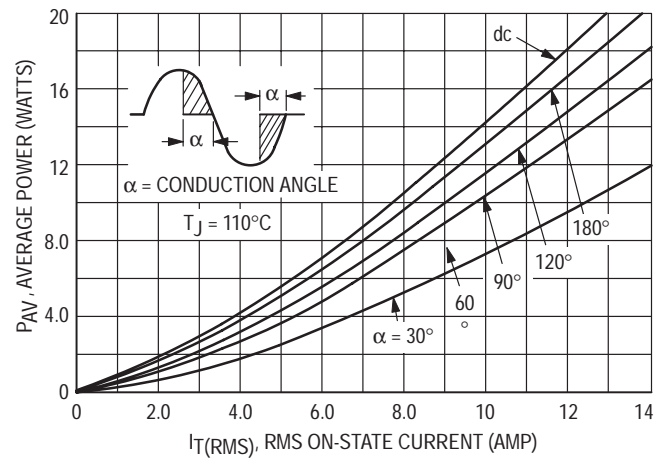


Figure 2. On-State Power Dissipation

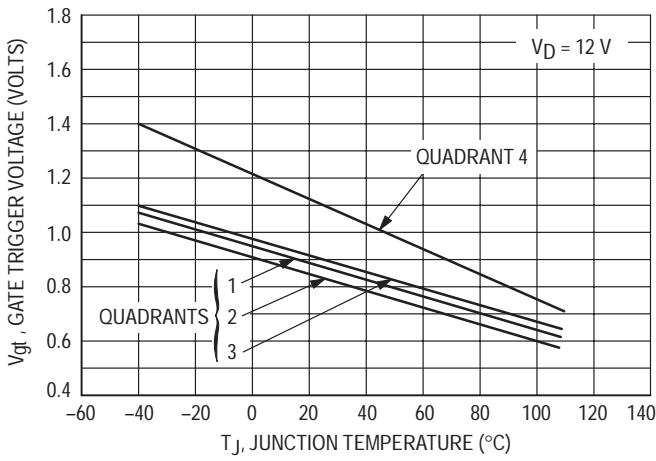


Figure 3. Typical Gate Trigger Voltage

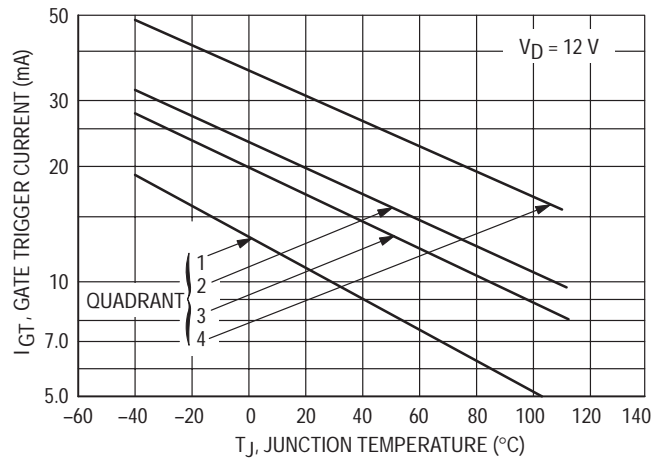


Figure 4. Typical Gate Trigger Current

### 2N6344A, 2N6348A, 2N6349A

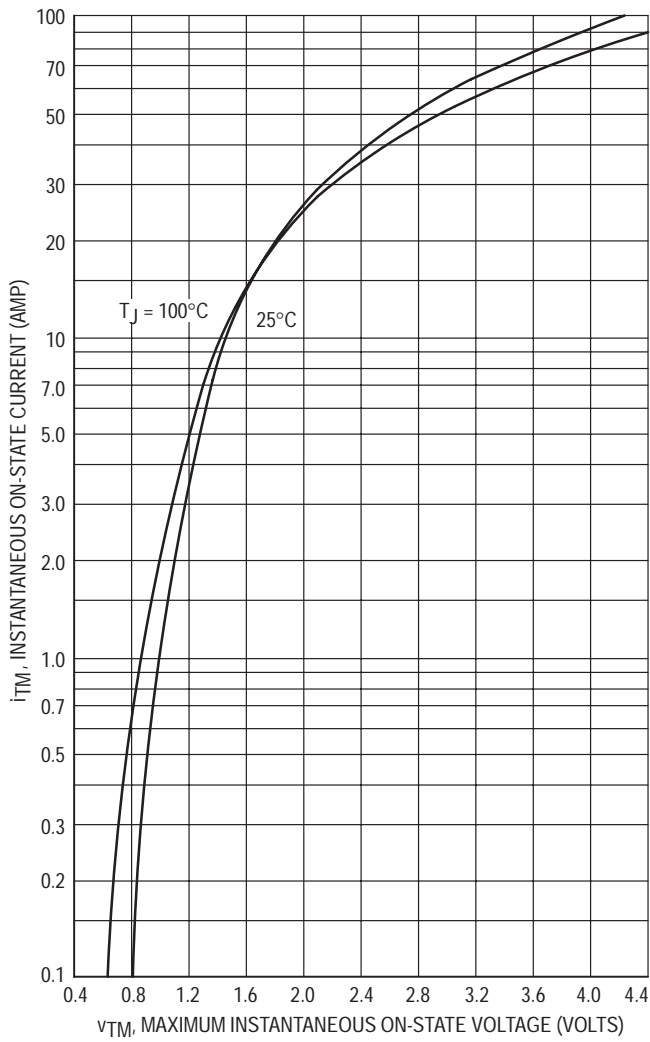


Figure 5. On-State Characteristics

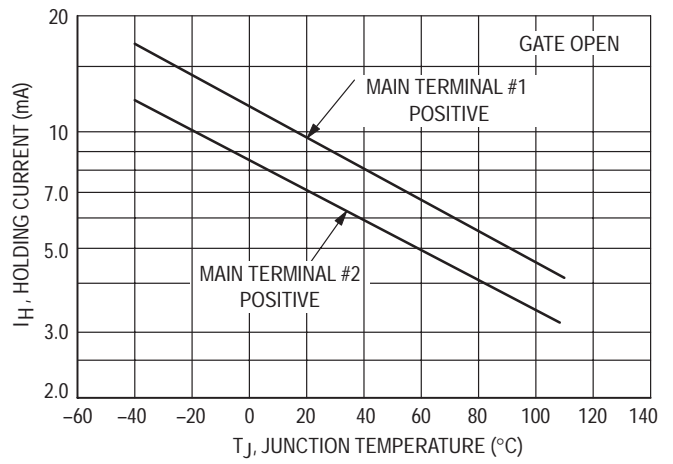


Figure 6. Typical Holding Current

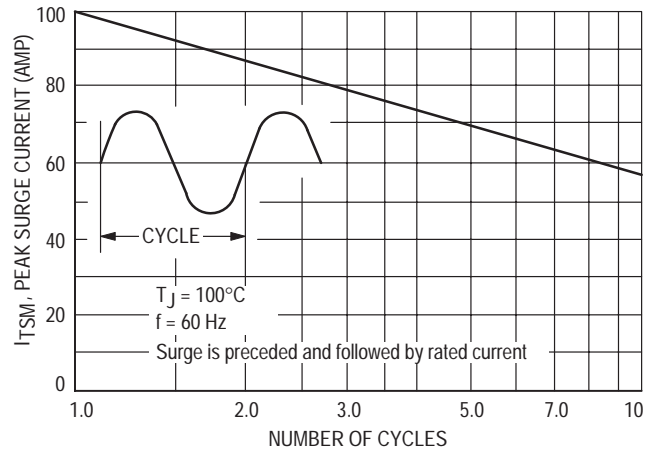


Figure 7. Maximum Non-Repetitive Surge Current

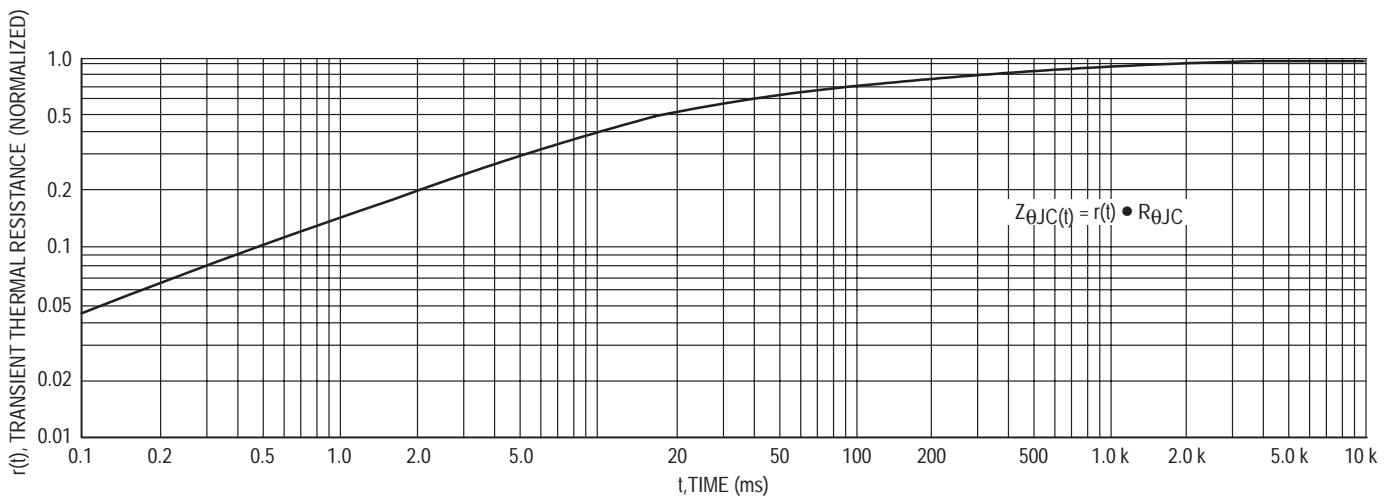
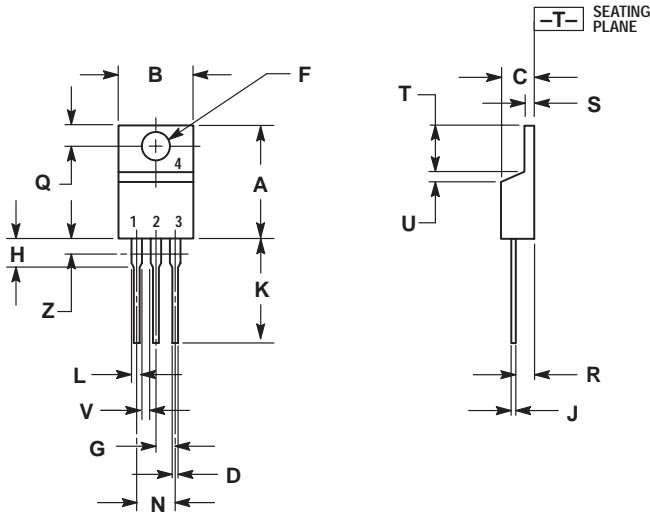


Figure 8. Typical Thermal Response

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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
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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## Notes

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