

DIGITRON SEMICONDUCTORS

2N6157-2N6165

SILICON BIDIRECTIONAL THYRISTORS

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

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

Rating	Symbol	Value	Unit
Peak repetitive off-state voltage ($T_J = -65$ to $+125^\circ\text{C}$) (1/2 sine wave 50 to 60Hz, gate open) 2N6157, 2N6160, 2N6163 2N6158, 2N6161, 2N6164 2N6159, 2N6162, 2N6165	V_{DRM}	200 400 600	Volts
Peak gate voltage	V_{GM}	10	Volts
RMS on-state current (full sine wave, 50 to 60Hz) ($T_C = -65$ to $+85^\circ\text{C}$) ($T_C = 100^\circ\text{C}$)	$I_{\text{T(RMS)}}$	30 20	Amps
Peak non-repetitive surge current (1 cycle, sine wave, 60 Hz preceded and followed by a 30A RMS current, $T_C = 85^\circ\text{C}$)	I_{TSM}	250	Amps
Circuit fusing considerations ($t = 8.3\text{ms}$)	I^2t	260	A^2s
Peak gate power ($T_J = 80^\circ\text{C}$, pulse width = $2\mu\text{s}$)	P_{GM}	20	Watts
Average gate power ($T_J = 80^\circ\text{C}$, $t = 8.3\text{ms}$)	$P_{\text{G(AV)}}$	0.5	Watts
Peak gate current	I_{GM}	2.0	Amps
Operating junction temperature range	T_J	-65 to +125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-65 to +150	$^\circ\text{C}$
Stud torque		30	In. lb.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta\text{JC}}$	1	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak forward or reverse blocking current (Rated V_{DRM} or V_{RRM} @ $T_J = 25^\circ\text{C}$) (Rated V_{DRM} or V_{RRM} @ $T_J = 125^\circ\text{C}$)	I_{DRM} I_{RRM}	- -	- -	10 2	μA mA
Peak on-state voltage (either direction) ($I_{\text{TM}} = 42\text{A}$ peak, pulse width = 1 to 2 ms, duty cycle $\leq 2\%$)	V_{TM}	-	1.5	2.0	Volts
Gate trigger current (continuous dc) ⁽¹⁾ (Main terminal voltage = 12V, $R_L = 50\Omega$) MT2(+),G(+) MT2(+),G(-) MT2(-),G(-) MT2(-),G(+) MT2(+),G(+); MT2(-), G(-) $T_C = -65^\circ\text{C}$ MT2(+),G(-); MT2(-), G(+) $T_C = -65^\circ\text{C}$	I_{GT}	- - - - - - -	15 20 20 30 - - -	60 70 70 100 200 250	mA

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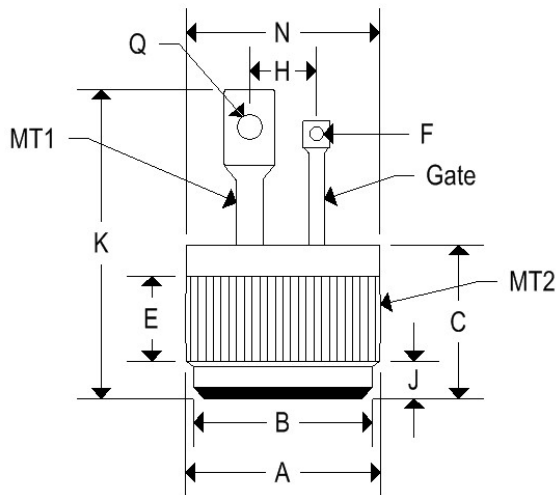
2N6157-2N6165

SILICON BIDIRECTIONAL THYRISTORS

Characteristic	Symbol	Min	Typ.	Max	Unit
Gate trigger voltage (continuous dc) (Main terminal voltage = 12V, $R_L = 50\Omega$) MT2(+),G(+) MT2(+),G(-) MT2(-),G(-) MT2(-),G(+) All quadrants Main terminal voltage = rated V_{DRM} , $R_L = 10k\Omega$, $T_J = 125^\circ C$	V_{GT}	-	0.8	2	Volts
Holding current (Main terminal voltage = 12V, gate open) (initiating current = 500mA) MT2(+) MT2(-) Either direction, $T_C = -65^\circ C$	I_H	-	8	70	mA
Turn on time (Main terminal voltage = rated V_{DRM} , $I_{TM} = 42A$, gate source voltage = 12V, $R_S = 50\Omega$, rise time = 0.1 μs , pulse width = 2 μs)	t_{gt}	-	1	2	μs
Blocking voltage application rate at commutation, $f = 60Hz$, $T_C = 85^\circ C$ On state conditions: ($I_{TM} = 42A$, pulse width = 4ms, $di/dt = 17.5A/ms$) Off-state conditions: (Main terminal voltage = rated V_{DRM} , 200 μs min., gate source voltage = 0V, $R_S = 50\Omega$)	$dv/dt(c)$	-	5	-	V/ μs

MECHANICAL CHARACTERISTIC

Case	Digi PF2 (2N6157-2N6159)
Marking	Body painted, alpha-numeric



	DIGI PF2			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.501	0.505	12.730	12.830
B	0.465	0.475	11.810	12.060
C	0.330	0.380	8.390	9.650
E	0.100	-	2.540	-
F	0.035	0.085	0.890	2.160
J	0.080	0.097	2.040	2.460
K	-	0.800	-	20.320
N	-	0.510	-	12.950
Q	0.065	0.160	1.650	4.060

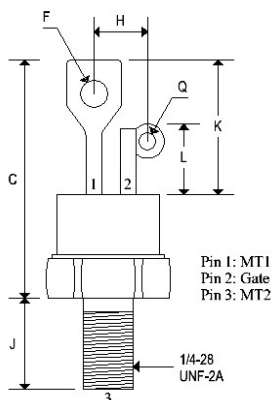
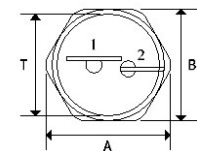
DIGITRON SEMICONDUCTORS

2N6157-2N6165

SILICON BIDIRECTIONAL THYRISTORS

MECHANICAL CHARACTERISTICS

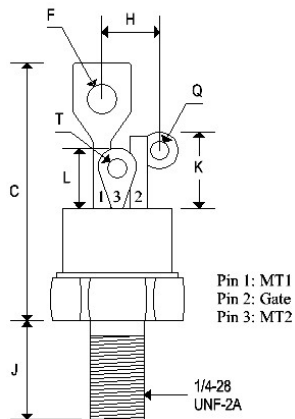
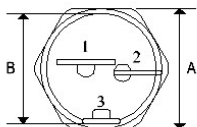
Case	TO-48 (2N6160-2N6162)
Marking	Alpha-numeric
Pin out	See below



	TO-48			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.604	0.614	15.340	15.600
B	0.551	0.559	14.000	14.200
C	1.050	1.190	2.670	30.230
F	0.135	0.160	3.430	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.620	0.670	15.750	17.020
L	0.300	0.350	7.620	8.890
Q	0.055	0.085	1.400	2.160
T	0.501	0.505	12.730	12.830

MECHANICAL CHARACTERISTICS

Case	TO-48 ISO (2N6163-2N6165)
Marking	Alpha-numeric
Pin out	See below



	TO-48 ISO			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.551	0.559	14.000	14.200
B	0.501	0.505	12.730	12.830
C	-	1.280	-	32.510
F	-	0.160	-	4.060
H	-	0.265	-	6.730
J	0.420	0.455	10.670	11.560
K	0.300	0.350	7.620	8.890
L	0.255	0.275	6.480	6.990
Q	0.055	0.085	1.400	2.160
T	0.135	0.150	3.430	3.810

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2N6157-2N6165 SILICON BIDIRECTIONAL THYRISTORS

FIGURE 1 - RMS CURRENT DERATING

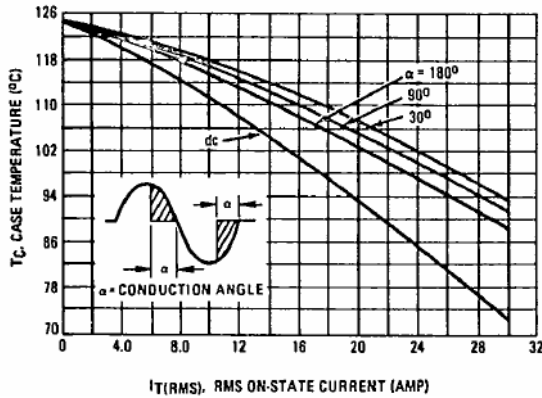


FIGURE 2 - POWER DISSIPATION

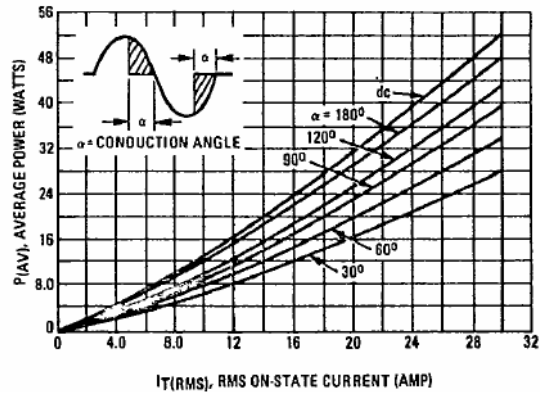


FIGURE 3 - TYPICAL GATE TRIGGER VOLTAGE

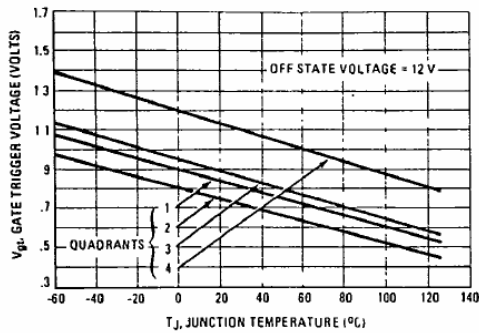


FIGURE 5 - MAXIMUM ON-STATE CHARACTERISTICS

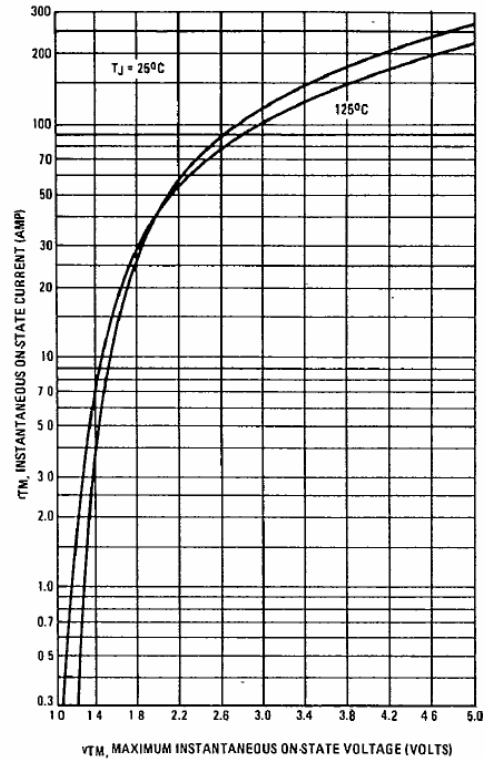


FIGURE 4 - TYPICAL GATE TRIGGER CURRENT

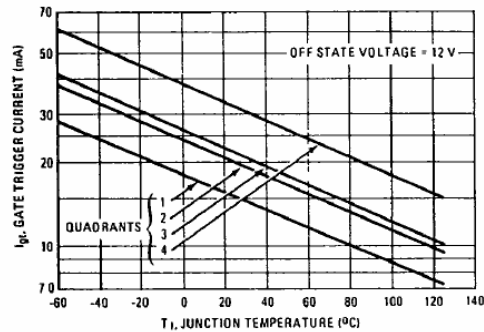


FIGURE 6 - TYPICAL HOLDING CURRENT

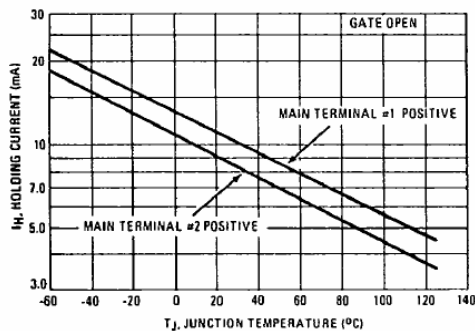


FIGURE 7 - MAXIMUM ALLOWABLE SURGE CURRENT

