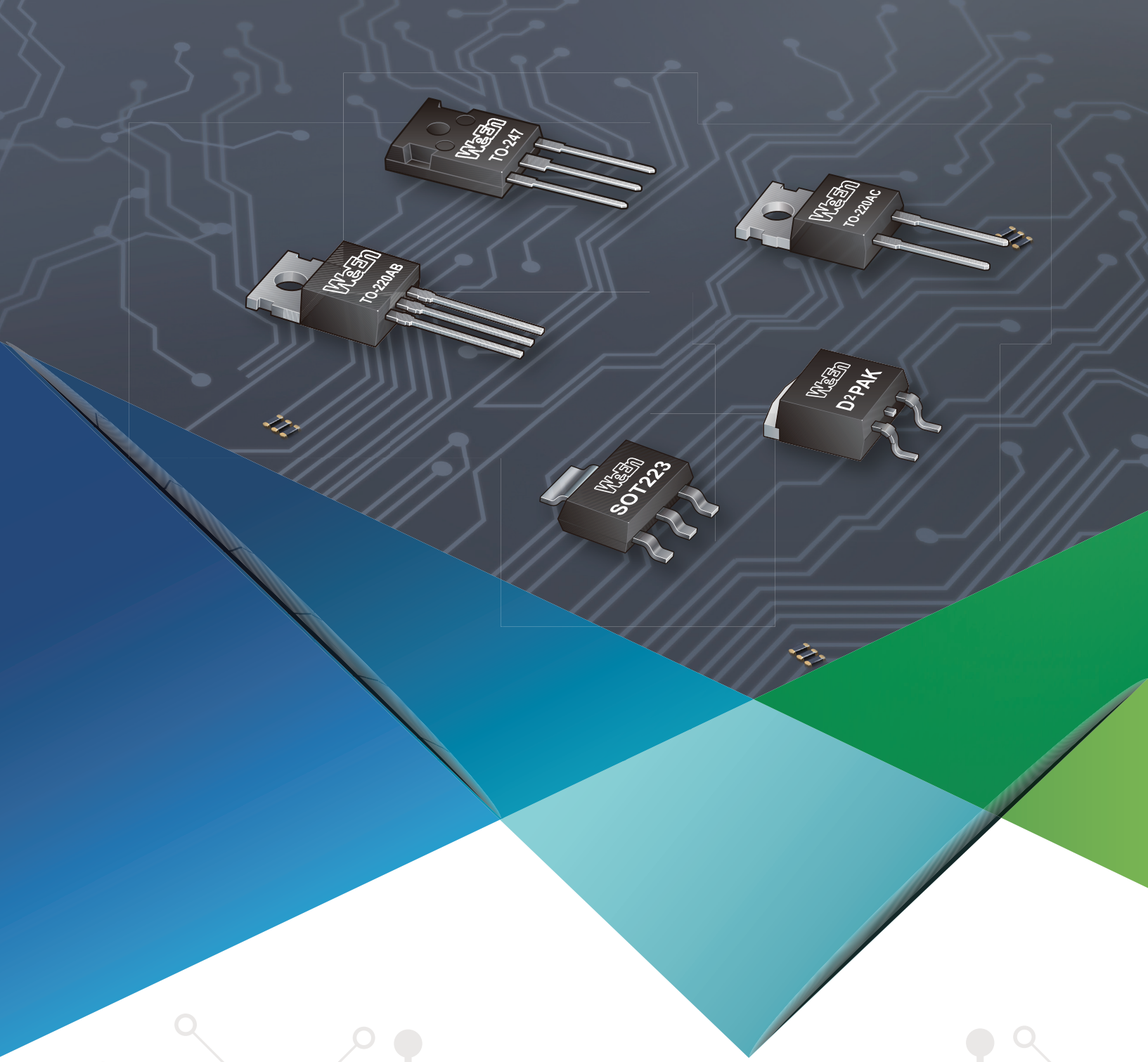


WeEn Semiconductors

Product Selection Guide

WeEn
WeEn Semiconductors

WeEn Semiconductors:
50-Years Leading Experience in Power

1969 — PHILIPS
- High Voltage Transistors (HVT)
- Fast, Ultrafast & Hyperfast Power Diodes
- Bipolar 4-Quadrant Triacs

1980s
- Bipolar 3-Quadrant Hi-Com Triacs

2000s
- Hyperfast diodes
- Triac & SCR Planar Technology Platform

2006 — NXP
- Super Advanced Best Efficiency Rectifier Diodes (SABER)
- Generation 1: Schottky Barrier Diodes

2009
- ACT & ACTT Platform (AC Switch), Casco Diodes

2013
- Temperature & Overload Protected Triac (TOPTriac)

2015 — WeEn
- Enhanced Efficiency Pt Planar diodes (EEPP)
- Generation 2: Schottky Barrier Diodes
- Silicon Carbide Diodes
- High Voltage SCRs

2019
- Standard Power Diodes
- Automotive SCRs
- 1600V Planar SCRs

WeEn
WeEn Semiconductors

Welcome to the 2019 edition of WeEn Semiconductors Selection Guide. Here we present all our devices to give you a complete overview of our portfolio. As a key player in the semiconductor industry, WeEn has focused on developing a large portfolio of industry-leading bipolar power products including thyristors (i.e. silicon controlled rectifiers and triacs), silicon power diodes and high voltage transistors. Additionally, WeEn has developed a state-of-the-art portfolio of silicon carbide diodes and power Schottky diodes as well as making available a number of AECQ products. All these products are widely used in the markets for telecommunications, computers, consumer electronics, intelligent home appliances, lighting, automotive and power management applications.

With over 50 years of design and manufacture experience, WeEn helps to drive up efficiency in your designs with the creative spirit of innovation and desire for quality.

AC THYRISTOR TRIACS / AC THYRISTORS

AC THYRISTOR TRIACS

(3Q Hi-Com power switches, overvoltage protection)

Types in **bold red** represent new products

$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT} (max) (mA)	SOT78 (TO220AB)	SOT186A (isolated TO220AB)	SOT223	SOT226 (I^2PAK)	SOT404 (D^2PAK)	SOT428 (DPAK)
2	800	E		ACTT2X				ACTT2S
2	800	ETN		**ACTT2X**	**ACTT2W**			**ACTT2S**
4	800	C/E		ACTT4X				ACTT4S
6	800	E	ACTT6	ACTT6X		ACTT6G	ACTT6B	
6	800	CN	ACTT6	ACTT6X			ACTT6B	
8	800	C0/C0T	ACTT8	ACTT8X			ACTT8B	
8	800	CTN	ACTT8	ACTT8X			ACTT8B	
10	800	C/CT	ACTT10	ACTT10X				
10	800	CTN	ACTT10	ACTT10X			ACTT10B	
12	800	C/CT	ACTT12	ACTT12X			ACTT12B	
12	800	CTN	ACTT12	ACTT12X			ACTT12B	
16	800	CTN	ACTT16	ACTT16X			ACTT16B	

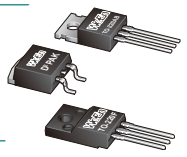
I_{GT} key: C = 35 mA; C0 = 5 - 30 mA; E = 10 mA

T: high T_j(max) 150 °C N: Enhanced Dynamic Performance

In the spotlight

AC Thyristor Triacs ACTT10 series, ACTT12 series

- Planar passivated with overvoltage clamping function
- High energy surge handling
- Very high dV_D/dt for maximum immunity to false triggering
- High T_j(max) to 150 °C



AC THYRISTORS

(2Q Hi-Com power switches, exclusive negative gate triggering, 'Common' mounting base, overvoltage protection)

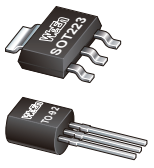
$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT} (max) (mA)	SOT54 (TO92)	SOT223	SO8
0.2	600	D			ACT102H
0.8	600	D/E	ACT108	ACT108W	
	800	E	ACT108	ACT108W	

I_{GT} key: D = 5 mA; E = 10 mA

In the spotlight

AC Thyristors ACT108-800E , ACT108W-800E

- Planar passivated with overvoltage clamping function
- Working voltage increased to 800V
- Enhanced overvoltage clamping capability
- High false trigger immunity



TEMPERATURE AND OVERLOAD PROTECTED TRIACS (TOPTriac)

2Q Hi-Com power switches, exclusive negative gate triggering, over-temperature protection

Types in **bold red italic** represent products in development

$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT} (max) (mA)	SOT78 (TO220)	TO263 (D^2PAK)
12	800	C0	TOPT12	
16	800	C0	TOPT16	***TOPT16B***

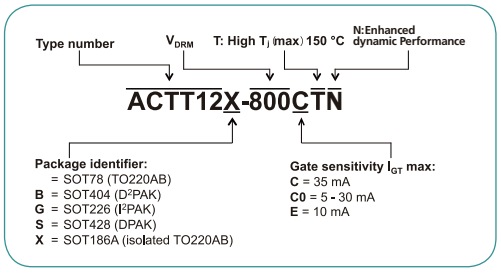
I_{GT} key:
C0 = 5 - 35mA

In the spotlight

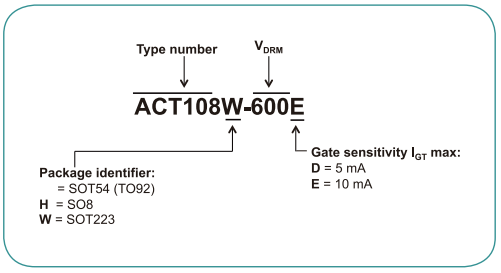
TOPTriac TOPT12, TOPT16

- Planar passivated for voltage ruggedness & reliability
- Over temperature & over load protection
- No need to over-specify triac and heatsink
- Avoid loss of control at high temperature
- Status monitoring with help of microcontroller

AC Thyristor Triacs part numbering



AC Thyristors part numbering



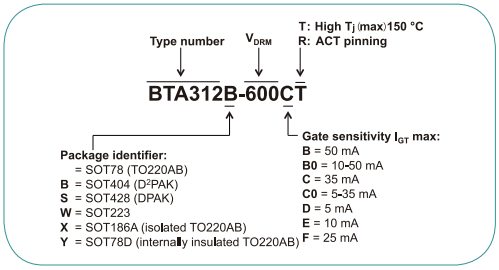
3Q *Hi-Com* TRIACS (0.8A - 45A)

Types in **bold red** represent new products
Types in **bold red italic** represent products in development

$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT}(max) (mA)	SOT54 (TO92)	SOT78 (TO220AB)	SOT78D (internally insulated TO220AB)	SOT186A (isolated TO220AB)	SOT223	SOT226 (I^2PAK)	SOT404 (D^2PAK)	SOT428 (DPAK)	SOT1292 (internally insulated TO-3P)
0.8	600 / 800	D					BTA2008W				
	600 / 800	D/E	BTA2008								
	1000	D	BTA2008								
	1000	DN	**BTA2008**								
1	600 / 800	B/E/ER	BTA201								
	600 / 800	E					BTA201W				
	600	B/C/D/E/F					BTA204W*				
	800	C/E					BTA204W*				
2	600 / 800	D/E				BTA202X					
3	800	CT	**BTA203**								
4	600	B/C/D/E/F		BTA204		BTA204X				BTA204S	
	800	B/C/E		BTA204		BTA204X				BTA204S	
	1000	C				BTA204X				BTA204S	
6	800	CT/ET		BTA206		BTA206X					
8	600	D		BTA208		BTA208X				BTA208S	
	600 / 800	B/E/F		BTA208		BTA208X				BTA208S	
	800	CT				***BTA208X***					
	800	B0/C0				BTA308X					
	800	C0T			**BTA308Y**						
	800	ET		BTA308		BTA308X				BTA308S	
	800	F0				**BTA308X**					
	1000	B				BTA208X					
	1000	C				BTA208X			BTA208B		
	1000	C0				BTA208X			BTA208B		
	1000	C0T				**BTA408X***					
10	600 / 800	C/D/E		BTA310		BTA310X					
	600 / 800	BT/CT/ET		BTA410*	BTA410Y*	BTA410X*					
12	600	CT		BTA312				BTA312G	BTA312B		
	600	D		BTA312		BTA312X			BTA312B		
	600 / 800	B/C/E		BTA312		BTA312X			BTA312B		
	600 / 800	C			BTA312Y						
	600 / 800	B/C			BTA412Y*						
	600 / 800	ET			BTA412Y*						
	800	CT		BTA312		BTA312X					
	800	ET		BTA312					BTA312B		
16	600	BT		BTA316					BTA316B		
	600	B0		BTA316					BTA316B		
	600	CT							BTA316B		
	600	D		BTA316							
	600 / 800	B/C/E		BTA316		BTA316X			BTA316B		
	600 / 800	ET		BTA316							
	600 / 800	B/C			BTA416Y*						
	800	B0		BTA316		BTA316X					
	800	BT/CT			**BTA316Y**						
	800	CT		BTA316		BTA316X					
20	800	BT/CT		BTA420*	BTA420Y*	BTA420X*					
25	600	BT		BTA225							
	600 / 800	B		BTA225					BTA225B		
	800	BT							BTA225B		
	800	BT/CT			BTA425Y*						
	800	B/BT				BTA425X*					
30	800	BT		BTA330		BTA330X					
	800	BT/CT			BTA330Y						
40	800	BT									BTA440Z*
45	800	BT									BTA445Z

3Q Triacs part numbering

*high surge I_{TSM} I_{GT} key: B= 50 mA, B0 = 10 - 50 mA, C = 35 mA, C0 = 5 - 35 mA, D = 5 mA, E = 10 mA, F = 25 mA T: high T_j(max) 150 °C R: ACT Pinning



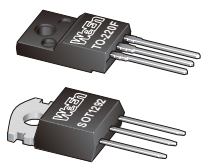
In th espotlight

3Q Hi-Com Triacs BTA425, BTA330, BTA440, BTA445

Planar passivated for voltage ruggedness and reliability

High junction operating temperature capability (150 °C) Less sensitive gate for high noise immunity

High commutation, high dV_D/dt for maximumm immunity to false triggering



4Q Triacs

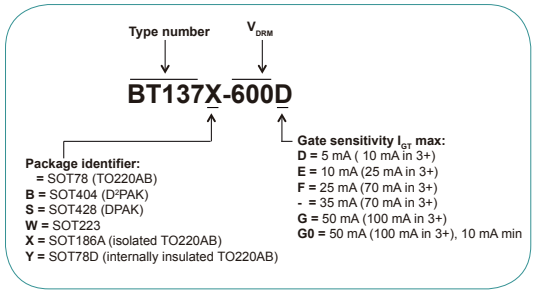
(0.6A - 45A)

Types in **bold red** represent new products

$I_{T(RMS)}$ (A)	V_{DRM} (V)	I_{GT} (max) (mA)	SOT54 (TO92)	SOT78 (TO220AB)	SOT78D (internally insulated TO220AB)	SOT82	SOT186A (isolated TO220AB)	SOT223	SOT404 (D^2PAK)	SOT428 (DPAK)	SOT1292 (internally insulated TO-3P)
0.6	400	5/5/5/7	MAC97A6								
	600	5/5/5/7	MAC97A8								
1	600	3/3/3/7						BT131W			
	600 / 800	3/3/3/7	BT131								
	600 / 800	5/5/5/7	BT131-D								
	600 / 800	10/10/10/10	BT131-E								
	600 / 800	3/3/3/5	Z0103MA/NA					Z0103MN/NN			
	600 / 800	5/5/5/7	Z0107MA/NA					Z0107MN/NN			
	600 / 800	10/10/10/10	Z0109MA/NA					Z0109MN/NN			
	600 / 800	3/3/3/5	Z0103MA0/NA0**					Z0103MN0/NN0**			
	600 / 800	5/5/5/7	Z0107MA0/NA0**					Z0107MN0/NN0**			
	600 / 800	10/10/10/10	Z0109MA0/NA0**					Z0109MN0/NN0**			
	600	5/5/5/10	BT132-D*								
	600	D/E/-						BT134W*			
	800	-						BT134W*			
4	600	D/E/-/G				BT134					
	800	E/-				BT134					
	600 / 800	D/E		BT234*			BT234X*				
	600	D/-		BT136			BT136X			BT136S	
	600	F					BT136X			BT136S	
	600 / 800	E		BT136			BT136X		BT136B	BT136S	
	800	F								BT136S	
	800	-					BT136X			BT136S	
6	600	F/-/G					BT236X				
	800	-/G					BT236X				
8	600	D/-/G		BT137			BT137X			BT137S	
	600	E		BT137			BT137X		BT137B	BT137S	
	600	F					BT137X		BT137B	BT137S	
	600 / 800	G0/G0T		BT137							
	800	E		BT137			BT137X			BT137S	
	800	F							BT137B	BT137S	
	800	-		BT137			BT137X		BT137B		
	800	G							BT137B	BT137S	
12	600	D		BT138			BT138X				
	600	-/G		BT138			BT138X		BT138B		
	600	F					BT138X		BT138B		
	600	G0/G0T		BT138							
	600 / 800	E		BT138	BT138Y		BT138X		BT138B		
	800	F					BT138X				
	800	-		BT138			BT138X				
	800	G		BT138							
16	600 / 800	B			**BTA16**						
	600	E/-		BT139			BT139X		BT139B		
	600	F/G					BT139X		BT139B		
	600	G0/G0T		BT139							
	800	E		BT139					BT139B		
	800	F							BT139B		
	800	-		BT139			BT139X		BT139B		
	800	G		BT139					BT139B		
20	600	50/50/50/75					MAC223A8X				
25	400	50/50/50/75		MAC223A6							
	600	G0/G0T		BTA140							
	600 / 800	-		BTA140							
40	600 / 800	B									BTA41
45	800	B									BTA45

I_{GT} key:
D = 5mA (10mA in 3+); E = 10mA (25mA in 3+); F = 25mA (70mA in 3+); - = 35mA (70mA in 3+); G = 50mA (100mA in 3+);
G0 = 50mA (100mA in 3+), 10mA min
* High ITSM **: Enhanced immunity to false triggering T: high T_j(max) 150 °C

4Q Triacs part numbering



In the spotlight

4Q Triacs Z010*0 series**

Planar passivated for voltage ruggedness and reliability

Improved dynamic performance over Z010*** series

Best false trigger immunity for sensitive 4Q triacs

SILICON CONTROLLED RECTIFIERS

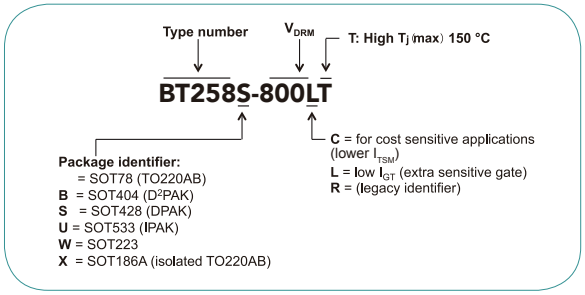
(0.8A - 126A)

Types in **bold red** represent new products
Types in **bold red italic** represent products in development

$I_{T(RMS)}$ (A)	$I_{T(AV)}$ (A)	V_{DRM} & V_{RRM} (V)	I_{GT} (max) (mA)	SOT54 (TO92)	SOT78 (TO220AB)	SOT82	SOT89	SOT186A (isolated TO220AB)	SOT223	SOT404 (D^2PAK)	SOT428 (DPAK)	SOT429 (TO-247)	SOT533 (IPAK)	SOT1259 (TO-3P)	SOT1292
															
0.8	0.5	200	0.2						MCR08BT1						
		400	0.012	EC103D1					EC103D1W						
		600	0.5µA min - 7µA max	N0118GA											
		200 / 400 / 600	0.2	BT149B/D/G											
		200 / 400 / 600	0.2	BT169B/D/G											
		400	0.015 min - 0.05 max	BT169D-L											
		500 / 600	0.02 min - 0.2 max	BT168E/G											
		600	0.015 min - 0.05 max	BT169G-L											
		600	0.03 min - 0.06 max	BT169G-M											
		600	0.015 min - 0.1 max				*NCR100Q-6M*								
		800	0.1	BT169H											
		800	0.015 min - 0.05 max	BT169H-L											
1	0.6	600	0.02 min - 0.2 max						BT168GW						
		600	0.07 min - 0.45 max						BT168GWF**						
		600	0.2						BT148W-R*						
1.1	0.7	850	0.015 min - 0.05 max						NCR100W-10L						
		850	0.1						NCR100W-10M						
		1000	0.015 min - 0.05 max						NCR100W-12L						
		1000	0.1						NCR100W-12M						
1.25	0.8	1250	0.1						*NCR125W-125M*						
4	2.5	400 / 500 / 600	0.2			BT148-R									
		500	0.2		BT150-R										
		600	0.2								BT150S-R				
8	5	500 / 600 / 800	0.2		BT258-R			BT258X-R							
		600	0.2										BT258U-R		
		600	5								BT300S-R				
		800	0.05								BT258S-LT				
		800	0.2								BT258S-R				
12	7.5	650	0.2								BT151S-S				
		500 / 650	5		BT151-L*						BT151S-L*				
		600	5							TYN12B-LT					
		650	1.5-5		BT151-LTN			BT151X-LTN							
		650	15								BTH151S-R*				
		500 / 650 / 800	15		BT151-C			BT151X-C					BT151U-C		
		500 / 650 / 800	15		BT151-R*			BT151X-R*			BT151S-R*				
		500 / 1000	15		BT151-RT*										
16	10	600	15		TYN16-CT			TYN16X-CT		TYN16B-CT	TYN16S-CT				
		600 / 800	25		TYN16-RT*			TYN16X-RT*							
20	13	400 / 600 / 800	32		BT152-R			BT152X-R		BT152B-R					
		500	32		BT152-RT										
		600	32							TYN20B-T					
		800	32		TYN20-T			TYN20X-T		TYN20B-T					
25	16	800	1.5 - 10		BT145-RT										
		800	35		BT145-R			BT145X-R							
31	20	1200	32		BT152-T										
40	25	800	15		TYN40-T										
47	30	1200	50							*BT153B-T-A*					
79	50	1200	50									BT155W-T		BT155K-T	BT155Z-T
		1200	50									BT155W-T-A			
		1600	80									TYN50W-T			
94	60	1400	80											TYN60K-T	
126	80	1200	70									BT158W-T			
		1600	80									TYN80W-T			

high I_{TSM} ** Hi-Com / fast turn-off T: high T_j(max) 150 °C A: Automotive qualified AEC-Q101

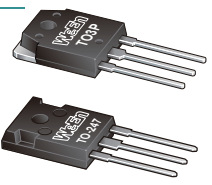
Silicon Controlled Rectifiers part numbering



In the spotlight

High Voltage, high surge capability SCR BT155 series, BT158, TYN60

- Planar passivated for voltage ruggedness and reliability
- Very low on-state voltage (V_T) contributes to best efficiency in AC-DC conversion
- High junction operating temperature capability (T_{jmax} 150 °C)
- Less sensitive gate for high noise immunity



POWER DIODES

Hyperfast Power Diodes

Types in **bold red italic** represent products in development

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @ 150C (V)	@ I_F (A)	t_{rr} (typ) @ 25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOD142 (2-pin TO247)	SOT429 (3-pin TO247)	SOT78 (TO220AB)	SOT186A (TO220FP)	SOT404 (D^2PAK)
400	2 x 5	0.85	5	30						***BYC405X-400P***	
500	5	1.15	5	16	BYC5D-500	BYC5DX-500					
600	5	1.4	5	19							BYC5B-600
	5	1.55	5	13	BYC5-600P	BYC5X-600P					
	8	1.4	8	20	BYC8D-600	BYC8DX-600					
	8	1.4	8	19	BYC8-600P	BYC8X-600P					BYC8B-600P
	10	1.4	10	19							BYC10B-600
	10	1.3	10	19	BYC10-600P	BYC10X-600P					
	10	1.4	10	18	BYC10D-600	BYC10DX-600					
	2 x 5	1.4	5	19					BYC10-600CT		
	15	1.4	15	22	BYC15-600P	BYC15X-600P					
	20	1.4	20	19	BYC20-600						
	20	1.2	20	26	BYC20D-600P	BYC20DX-600P					
	20	1.2	20	25		BYC20X-600P					
	30	1.5	30	26			BYC30DW-600P				
	30	1.38	30	29	BYC30-600P	BYC30X-600P	BYC30W-600P	BYC30WT-600P		BYC30B-600P	BYC30B-600P
	30	1.38	30	26			BYC30W-600PT2				
	60	1.55	60	40			BYC60W-600P				
	75	1.6	75	42			BYC75W-600P				

1200V Planar Hyperfast Power Diodes

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F(typ) @150C (V)	@ I_F (A)	t_{rr} (typ) @25C (ns)	SOD59 (TO220AC)	TO247-2L
1200V	5	2.0	5	42	BYC5-1200P	
	8	2.0	8	46	BYC8-1200P	
	15	2.0	15	61	BYC15-1200P	
	30	2.1	30	70	BYC30-1200P	BYC30W-1200P
	40	2.2	40	91		BYC40W-1200P
	60	2.2	60	96		BYC60W-1200P
	75	2.2	75	113		BYC75W-1200P
	100	2.2	100	115		BYC100W-1200P

In the Spotlight

1200V Planar Hyperfast Power Diodes

- Planar Passivated, Pt doping technology
- Fast recovery, System efficiency improvement
- Soft recovery, Reduce system EMI
- Avalanche ruggedness
- Reduces switching losses in associated MOSFET or IGBT

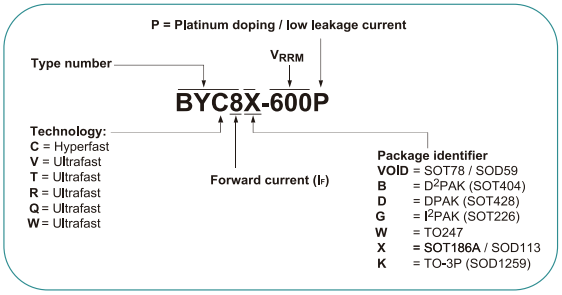
POWER DIODES

Ultrafast Power Diodes

Types in **bold red italic** represent products in development

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @150C (V)	@ I_F (A)	t_{rr} (typ) @25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOT78 (TO220AB)	SOT186A (isolated TO220AB)	SOT223	SOT226 (I^2PAK)	SOT404 (D^2PAK)	SOT428 (DPAK)	SMA	SOD132 (SMB)	SMC	SOT1259 (TO-3P)	(TO-3PF)	SOD142 (2-pin TO247)	SOT429 (3-pin TO247)
100	8	0.8	8	20	BYW29E-100														
100	2 x 10	0.72	8	20			BYV32E-100												
150	2 x 0.75	0.5	0.5	10					BYV40E-150										
150	8	0.8	8	20	BYW29E-150														
150	2 x 10	0.72	8	20			BYV32E-150												
150	2 x 15	0.78	15	20			BYV42E-150												
200	8	0.8	8	20	BYW29E-200	BYW29EX-200						BYW29ED-200							
200	2 x 5	0.8	5	15			BYQ28E-200	BYQ28X-200											
200	2 x 5	0.8	5	15			BYQ28E-200E					BYQ28ED-200PL							
200	14	0.83	14	20	BYV79E-200														
200	2 x 8	0.84	8	20			BYQ30E-200												
200	2 x 10	0.72	8	20			BYV32E-200P			BYV32G-200	BYV32EB-200P								
200	2 x 15	0.78	15	20			BYV42E-200			BYV42G-200	BYV42EB-200					BYQ72EK-200			BYV72EW-200
							BYQ42E-200												BYQ72EW-200
300	2 x 5	0.95	5	50			BYT28-300												
300	2 x 10	0.81	10	9			***BYV32E-300P***	***BYV32EX-300P***			***BYV32EB-300P***								
300	2 x 30	0.85	30	33												BYV430K-300P			BYV430W-300P
400	9	0.9	8	50	BYV29-400														
400	2 x 10	0.87	10	50			BYV34-400												
400	2 x 15	0.95	15	35															BYV74W-400
500	9	0.9	8	50	BYV29-500	BYV29X-500					BYV29B-500								
500	2 x 5	0.95	5	50			BYT28-500	BYT28X-500											
500	14	0.9	15	50	BYT79-500														
500	2 x 10	0.87	10	50			BYV34-500												
500	2 x 15	0.95	15	50			BYV44-500												
600	1	0.88	1	45									***MURS160***	***MURS160B***					
600	3	0.88	3	36										MURS360B					
600	5	0.9	5	45											MUR560				
600	5	1.1	5	17.5	BYV25F-600	BYV25FX-600					BYV25FB-600	BYV25FD-600							
600	5	0.97	5	50		BYV25X-600				BYV25G-600		BYV25D-600							
600	8	1.07	8	60	BYR29-600	BYR29X-600													
600	8	0.8	8	65											***MUR860***				
600	9	0.97	8	50	BYV29-600P	BYV29X-600P				BYV29G-600P	BYV29B-600P	BYV29D-600P							
600	9	1.25	8	17.5	BYV29F-600	BYV29FX-600					BYV29FB-600	BYV29FD-600							
600	10	1.6	10	20	BYV10-600P	BYV10X-600P													
600	10	1.6 max	10	35		BYV10EX-600P						BYV10ED-600P							
600	15	1	15	50	BYT79-600														
600	15	0.96	15	50		BYT79X-600P					BYT79B-600P								
600	2 x 10	0.92	10	50			BYV34-600	BYV34X-600		BYV34G-600									
600	2 x 10	1.3	10	20			BYV410-600	BYV410X-600P											
600	2 x 15	1.3	10	20												BYV415K-600P	BYV415J-600P		BYV415W-600P
600	30	0.98	30	42	BYV30-600P	BYV30X-600P					BYV30B-600P							BYV30W-600P	
600	40	0.97	40	52														BYV40W-600P	
600	2 x 30	1.25	30	53													BYV430J-600P		
600	60	1.2	60	53														BYV60W-600P	
800	8	1.07	8	60	BYR29-800														
800	8	1.2	8	40		BYR29X-800P													
1200	5	1.6	5	50								BYR5D-1200P							

Power Diode part numbering



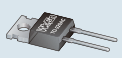
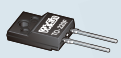
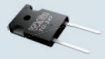
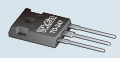
In the Spotlight

Ultrafast power diodes

- Fast switching
- High voltage capability
- Low forward voltage drop
- Low leakage current (platinum doped series)
- Low thermal resistance
- Soft recovery characteristic

SIC SCHOTTKY DIODE

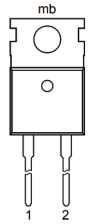
Types in **bold red** represent new products

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F(typ) @25C (V)	@I_F (A)	Q_r (typ) @25C (nC)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOD142 (2-pin TO247)	SOT429 (3-pin TO247)	SOT428 (DPAK)	SOT404 (D^2PAK)
										
650	4	1.5	4	7	NXPSC04650	NXPSC04650X			NXPSC04650D	NXPSC04650B
	6	1.5	6	10	NXPSC06650	NXPSC06650X			NXPSC06650D	NXPSC06650B
	8	1.5	8	13	NXPSC08650	NXPSC08650X			NXPSC08650D	NXPSC08650B
	10	1.65	10	12	NXPLQSC10650					
	10	1.5	10	15	NXPSC10650	NXPSC10650X			NXPSC10650D	NXPSC10650B
	12	1.5	12	20	NXPSC12650					NXPSC12650B
	16	1.5	16	26	NXPSC16650					NXPSC16650B
	20	1.5	20	28	NXPSC20650					NXPSC20650B
	2 x 10	1.5	10	14				NXPSC20650W		
	2 x 10	1.65	10	11				NXPLQSC20650W		
	2 x 15	1.75	15	15				NXPLQSC30650W		
1200	2	1.4	2	-	WNSC021200					
	5	1.4	5	-	WNSC051200					
	10	1.4	10	-	WNSC101200					
	10	1.4	10	24			WNSC101200W			
	2 x 5	1.6	10	12				WNSC101200CW		
	2 x 10	1.4	20	52			WNSC201200W			
	2 x 10	1.4	20	24				WNSC201200CW		

In the Spotlight

650V SiC Schottky Diode

- Highly stable switching performance
- High forward surge capability IFSM
- Extremely fast reverse recovery time
- Superior in efficiency to Silicon Diode alternatives
- Reduced losses in associated MOSFET
- Reduced EMI
- Reduced cooling requirements
- RoHS compliant

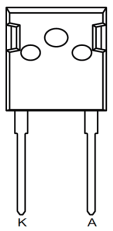


TO-220AC (SOD59A)

In the Spotlight

1200V SiC Schottky Diode

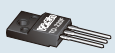
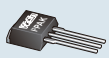
- Highly stable switching performance
- High forward surge capability IFSM
- Extremely fast reverse recovery time
- Superior in efficiency to Silicon Diode alternatives
- Reduced losses in associated MOSFET
- Reduced EMI
- Reduced cooling requirements
- RoHS compliant
- High junction operating temperature capability ($T_{j(max)}$ = 175 °C)



TO247-2L

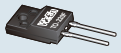
POWER SCHOTTKY DIODES

Types in bold red represent new products

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @120C (V)	@I_F per diode (A)	SOD78 (TO220AB)	SOD404 (D^2PAK)	SOT186A (isolated TO220AB)	TO262
							
100	2 x 10	0.73	10			WNS20S100CX	
	2 x 10	0.63	10	WNS20H100C	WNS20H100CB	WNS20H100CX	
	2 x 10	0.73	10	WNS20S100C	WNS20S100CB	WNS20S100CX	
	2 x 15	0.6	15	WNS30H100C	WNS30H100CB	WNS30H100CX	
	2 x 20	0.61	20	WNS40H100C	WNS40H100CB	WNS40H100CX	
	2 x 20	0.64	20				WNS40H100CG
	2 x 20	0.61	20	WNS40100C			

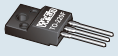
CASCO DIODES

employing series die technology for the lowest possible trr

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @25C (V)	@I_F (A)	t_{rr} (typ) @25C (ns)	SOD113 (2-pin SOT186A)
					
600V	8	2	8	12.5	BYC58X-600

600V - 1600V Standard Power Diodes

Types in bold red represent new products
Types in bold red italic represent products in development

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @150C (V)	@I_F (A)	I_{FSM} @10ms (A)	SOT186A (isolated TO220AB)	TO247-2L	SOT428 (DPAK)	SOD132 (SMB)
								
600V	10	0.89@25C	10	-	*WND10M600X*			
800V	8	0.84	8	150			SK8D	
	10	1.07	10	-	WND10P08X			
1000V	3	1.15@25C	3	-				*WND03M10*
1600V	8	1.0	8	150			WND08P16D	
	8	1.02	8	-	WND08P16X			
	45	1	45	475		WND45P16W		
	60	1.08	60	-		WND60P16W		

POWER DIODE BRIDGE

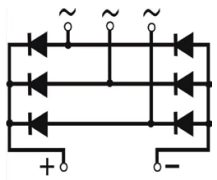
Types in bold red italic represent products in development

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @25C (V)	I_{FSM} @10ms (A)	GBJ	WMM01
					
600V	25	0.87	300	*WNB2560M*	
1600V	75	1.6_{MAX}	750		*WDMF75M16*

In the Spotlight

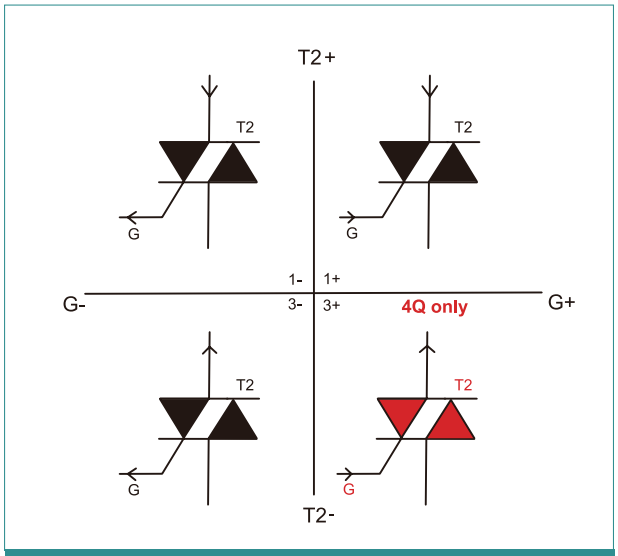
WDMF75M16

- Three phase rectifiers
- Heat transfer through aluminium oxide DBC, ceramic isolated metal baseplate
- High voltage capability
- High inrush current capability
- Planar process
- High operating temperature capability ($T_{j\,(max)}$ = 150°C)

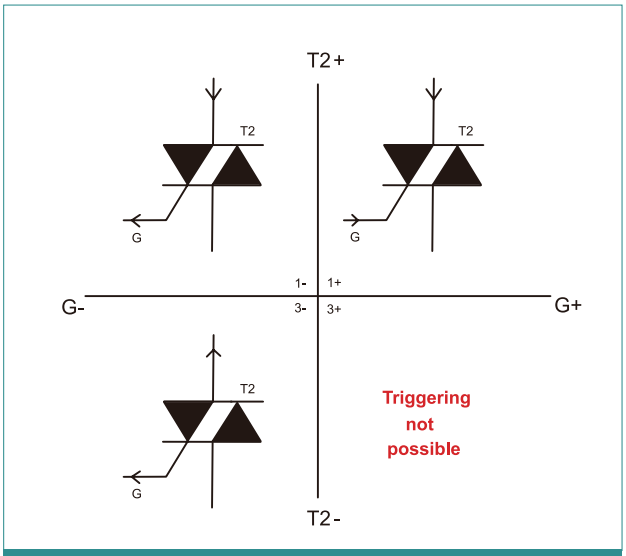


Getting to know WeEn Thyristors

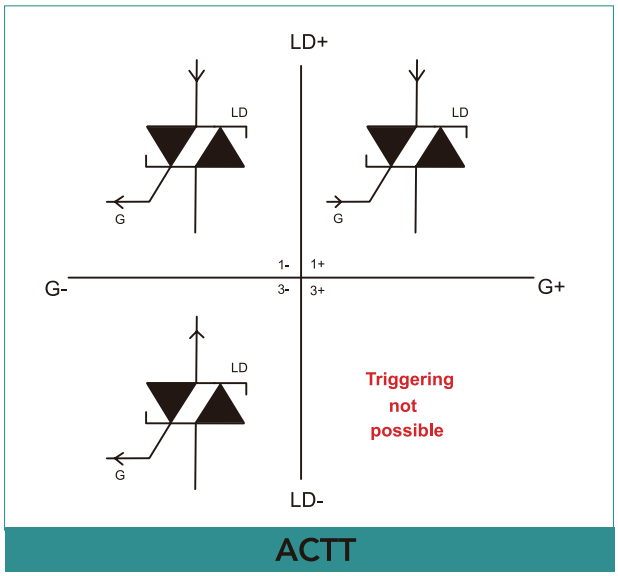
Triac triggering quadrants



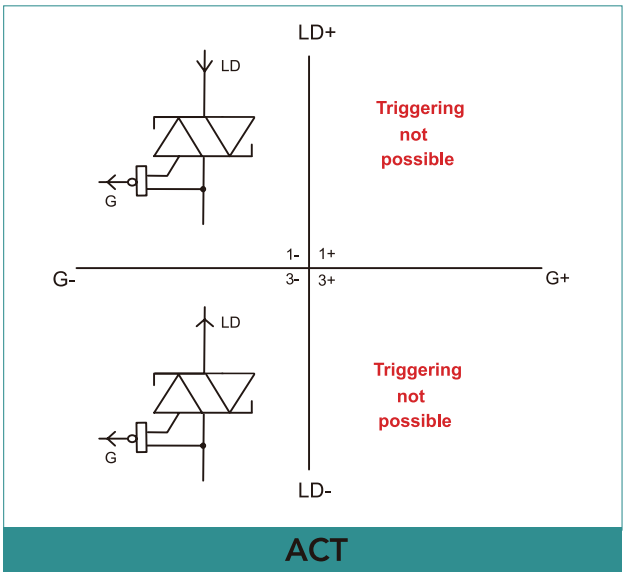
4Q triac



3Q Hi-Com™ triac



ACTT



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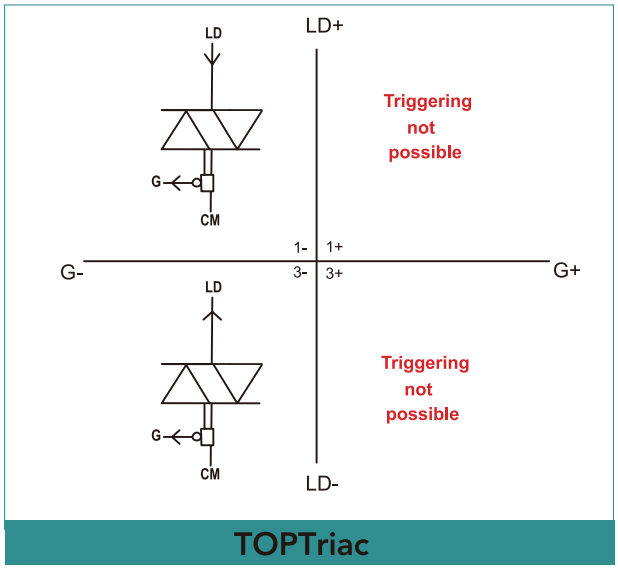


TOPTriac

- Only four-quadrant triacs can trigger in the 3+ quadrant (G+, T2-)
- This capability can be more of a disadvantage than an advantage because:
  - 3+ triggering is the most difficult and risky for the triac
  - The ability to trigger in the 3+ quadrant compromises the triac's dynamic performance
  - 4Q triacs are less rugged and easier to false trigger than 3Q triacs

Thyristor Parameters

3.1 Limiting Values – $I_{T(RMS)}$

Symbol	Parameter	Conditions	Min	Max	Unit
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_h \leq 75$ °C; Fig. 1; Fig. 2; Fig. 3	-	8	A

- Maximum allowable current to keep T_j within Tj(max)
- The critical condition in the example shown here (SOT186A Fullpack) is T(heatsink) ≤ 75°C
- For other packages the condition may be T(lead), T(solder point) or T(mounting base). It is the piece of metal closest to the die whose temperature can be measured.
- The temperature derating curve is shown below

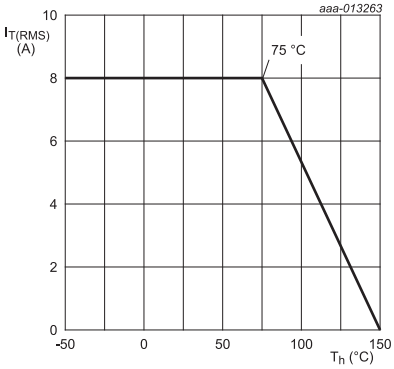


Fig. 1. RMS on-state current as a function of heatsink temperature; maximum values

3.2 Limiting Values – I_{TSM}

Symbol	Parameter	Conditions	Min	Max	Unit
I_{TSM}	non-repetitive peak on-state current	full sine wave; $T_{j(init)} = 25$ °C; $t_p = 20$ ms; Fig. 4; Fig. 5	-	60	A
		full sine wave; $T_{j(init)} = 25$ °C; $t_p = 16.7$ ms	-	65	A

- 'T' means Triac on state
- 'S' means Surge
- 'M' means Maximum
- Non-repetitive means single shot with full thermal recovery between surges to avoid cumulative heating. It does not mean once in a lifetime.
- I_{TSM} is strongly influenced by surge duration (pulse width)
  - o More AC mains cycles -> lower I_{TSM}
  - o Shorter pulse width higher than AC mains frequency -> higher I_{TSM}

3.3 Static characteristics – I_{GT}

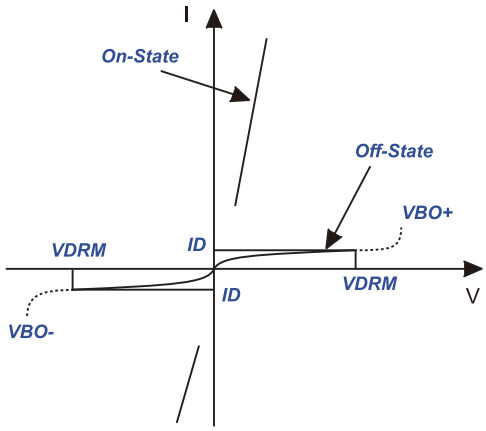
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{GT}	gate trigger current	$V_D = 12$ V; $I_T = 0.1$ A; T2+ G+; $T_j = 25$ °C; Fig. 7	5	-	35	mA
		$V_D = 12$ V; $I_T = 0.1$ A; T2+ G-; $T_j = 25$ °C; Fig. 7	5	-	35	mA
		$V_D = 12$ V; $I_T = 0.1$ A; T2- G-; $T_j = 25$ °C; Fig. 7	5	-	35	mA

- 'G' means Gate
- 'T' means Triac on state
- $I_{GT(max)}$ = highest gate current triac may require to guarantee triggering
- Trigger circuit must supply at least $I_{GT(max)}$ to guarantee triggering
- Gate current below $I_{GT(min)}$ is guaranteed not to trigger the triac
- I_{GT} is highly dependent on T_j

3.4 Limiting Values – V_{DRM}

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DRM}	repetitive peak off-state voltage		-	800	V

- 'D' is when the triac is non-conducting in the off state.
- 'R' means Repetitive
- 'M' means Maximum
- Exceeding V_{DRM} will cause the triac to turn on. This is one cause of false triggering.
- Triac will only be damaged if load current rises too fast (excessive dI/dt)



3.5 Dynamic characteristics – dV_D/dt

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
dV_D/dt	rate of rise of off-state voltage	$V_{DM} = 536$ V; $T_j = 150$ °C; ($V_{DM} = 67\%$ of V_{DRM}); exponential waveform; gate open circuit	1500	-	-	V/µs

- Rate of rise of off-state voltage minimum value is specified
- Externally applied condition below that level is guaranteed not to cause a false trigger
- Triggering the triac by exceeding its dV_D/dt withstand capability will not, on its own, damage the triac.
- [Current, not voltage, is most likely to damage triacs. The planar passivation of WeEn triacs makes them much more voltage-rugged than traditional older technology glass-passivated triacs.]
- dV_D/dt is inversely proportional to temperature; higher temperature results in worse noise immunity
- Very high dV_D/dt capability of 3Q Hi-Com triacs means that snubber protection should not be necessary

Date of release: May 2019

Document order number: 20190501

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