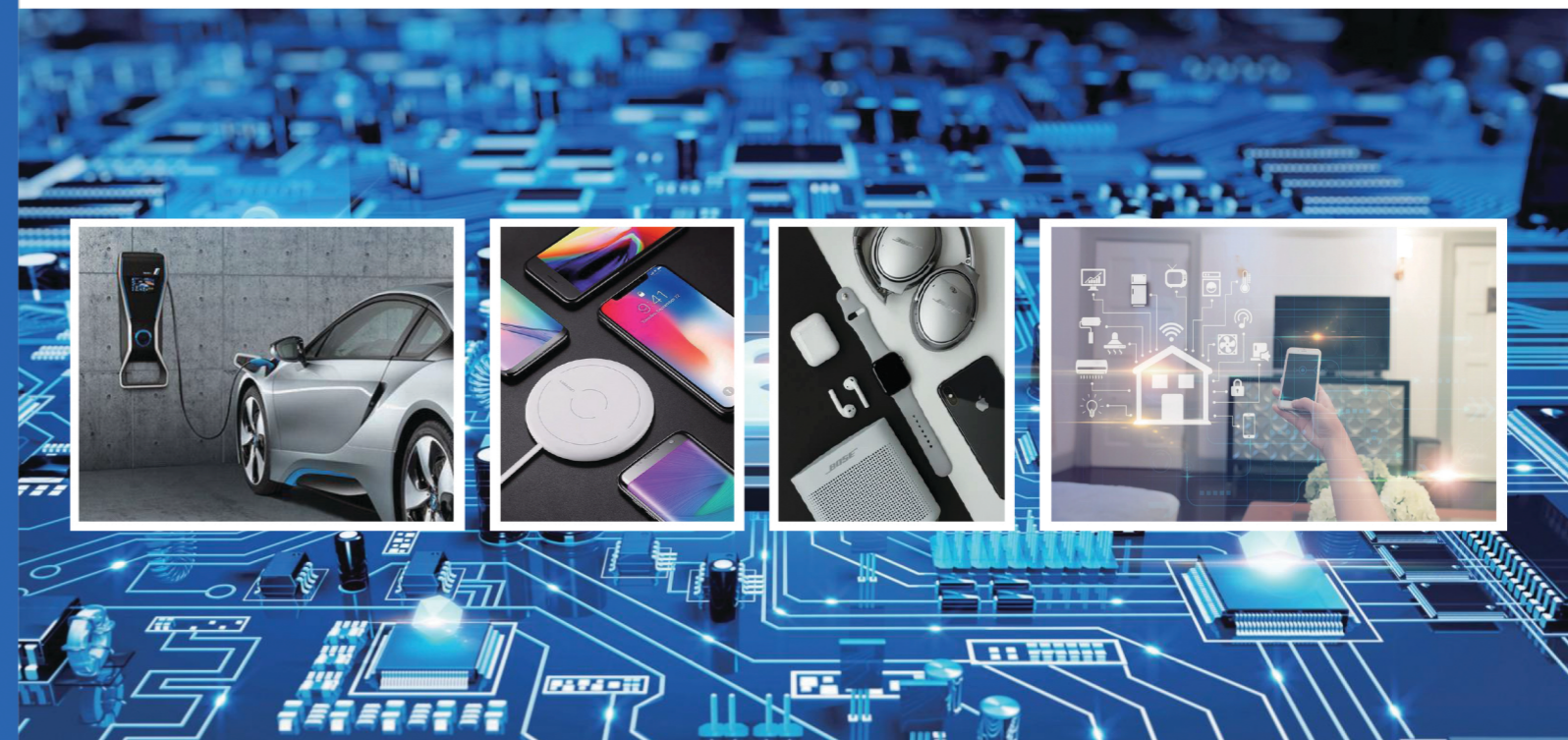


# TRR<sup>®</sup>

# TRR<sup>®</sup>

Zhejiang TRR MICROELECTRONICS INC.  
Guangdong TRR ELECTRONICS Co., LTD  
TRR Power Supply Institute



## 22 Years Experience:

Diode, Transistor Bridge rectifier,  
MOSFET and Wafer fabrication

 [www.platan.ru](http://www.platan.ru)  
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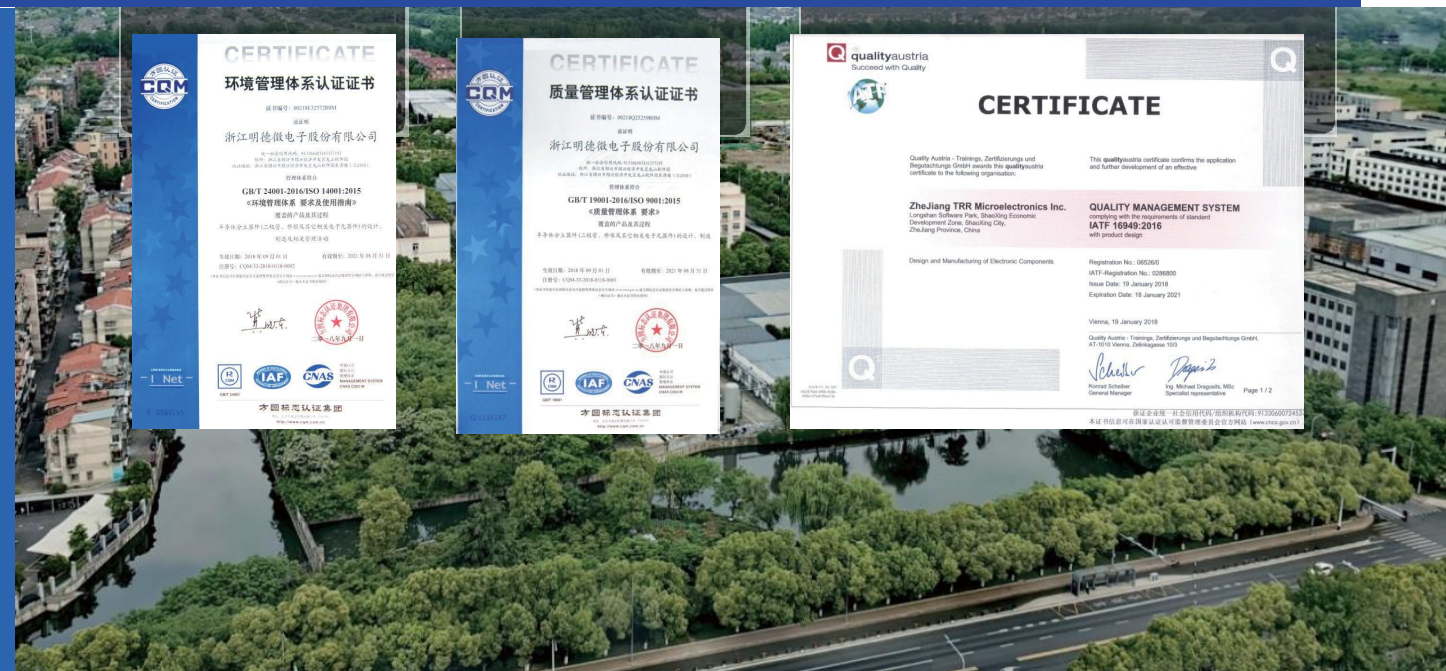
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# 企业简介

## COMPANY PROFILE

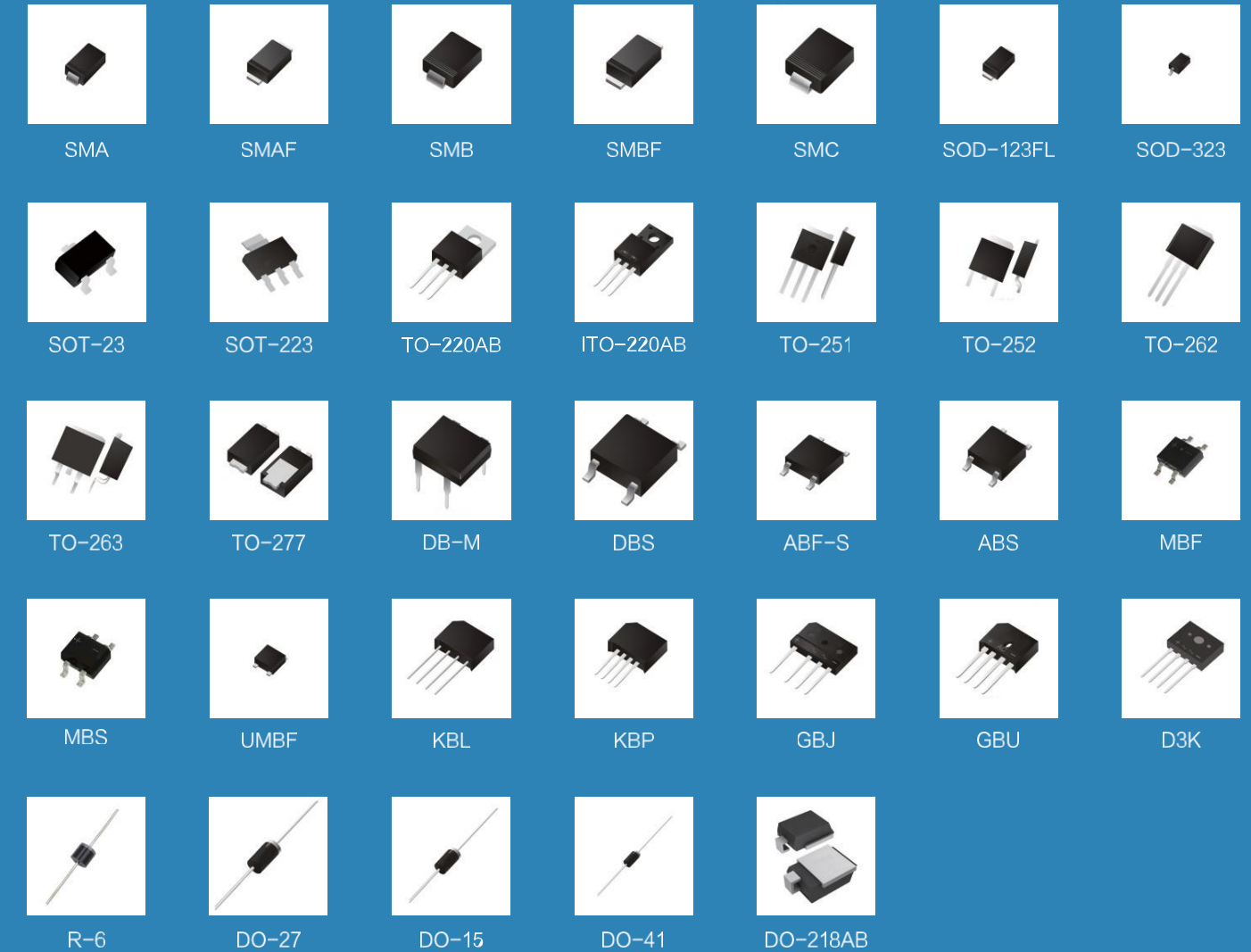
ZHEJIANG TRR MICROELECTRONICS INC. is one state capital hold controlling interest enterprise which make research, develop, manufacture and sell semiconductor discrete components and products as main operating business. We are subsidiary of A-shares quoted company 600059 and found in 2000, Toexpand oversea market business, Established subsidiary Guangdong TRR Electronics Co., Ltd.

TRR shares has multiply areas core technologies in wafer, package, apparatus test and application design, etc, we devote into research, manufacture, sell and application scheme design in new type components, already obtained more than 80 national authorized invent patents, include the general MB10F bridge in power supply industry, LED industry used UMB10F / B7 bridge, the globe smallest bridge IBS and series high junction temperature products. Our company focus on that provide the industry commonly used and customized products and service according to requirements for the users, the products widely applied in many areas such as power supply and adapters (customer: SUNGROW power supply), green lighting (customers: MLS, TOSPO lighting), router (customer: Huawei), smart phone (customers: Huawei, Xiaomi, OPPO) and telcom products, automobile electrics (customer: SAIC General Motors), frequency transformer, big and small household electrical appliances (customer: Gree), safety guard field (HIKVISION, DAHUA) and other field.



# 产品封装

## PRODUCT PACKAGE



The top management of our company has two professors from Electric Institute of Zhejiang University, and we have employed several aerospace and military project level power supply research and develop specialists in 2011, and we found TRR micro power supply research institute, we are professionally design and modify the power supply product scheme for customers, save cost and improve energy efficiency, or replace the lacked IC.

# Classified Catalogue

Diodes

A 1

SJ-COOL MOS

A 8

Diodes

Low VOL MOS

A 9

2

A

Low VOL MOS

A 1

0

Bridge Rectifier

A 3

MOSFET

A 4

Low VOL MOS

A 1

Recommended lead-free  
soldering conditions

A

1 2

Diagram

A 1 4 -

Transistors

A 5

A 1 8

High VOL MOS

A 6

Reliability Experiment

1A

3

High VOL MOS

TRR World Smallest

Rectifier bridge

A 1 9 - A 2 0

A

## PRODUCT CATALOG

Silicon Rectifiers		Surface Mount Fast Recovery Rectifiers	
1A1 ~ 1A7	1	DFR0.3A ~ DFR0.3M	8
1N4001 ~ 1N4007	1	DFR0.5A ~ DFR0.5M	8
RI101 ~ RI107	1	DFR0.7A ~ DFR0.7M	8
1N5391 ~ 1N5399	1	DFR1A ~ DFR1M	8
RI151 ~ RI157	1	DFR2A ~ DFR2M	8
RL201 ~ RL207	2	MAFR0.5A ~ MAFR0.5M	9
RL251 ~ RL257	2	MAFR1A ~ MAFR1M	9
1N5400 ~ 1N5408	2	MAFR2A ~ MAFR2M	9
6A05 ~ 6A10	2	RS1A ~ RS1M/SMA	9
SM4001 ~ SM4007	2	RS2A ~ RS2M/SMA	9
		RS1A ~ RS1M/SMB	10
		RS2A ~ RS2M/SMB	10
		RS3A ~ RS3M/SMB	10
		RS3A ~ RS3M/SMC	10
Surface Mount Standard Rectifiers		Ultra Fast Rectifiers	
DSR0.3A ~ DSR0.3M	3	1H1 ~ 1H8	11
DSR0.5A ~ DSR0.5M	3	HER101 ~ HER108	11
DSR0.7A ~ DSR0.7M	3	HER151 ~ HER158	11
DSR1A ~ DSR1M	3	HER201 ~ HER208	11
MASR0.5A ~ MASR0.5M	4	HER251 ~ HER258	12
MASR1A ~ MASR1M	4	HER301 ~ HER308	12
MASR2A ~ MASR2M	4	HER601 ~ HER608	12
S1A ~ S1M	4	UF4001 ~ UF4007	13
S2A/SMA ~ S2M/SMA	4	UF1001 ~ UF1007	13
S1A/SMB ~ S1M/SMB	5	UF5400 ~ UF5408	13
S2A ~ S2M	5	UF3001 ~ UF3007	13
S3A/SMB ~ S3M/SMB	5	SUF4001 ~ SUF4007	13
S3A ~ S3M	5		
S5A ~ S5M	5		
Fast Recovery Rectifiers		Surface mount Ultra Fast Rectifiers	
FR101 ~ FR107	6	DHE0.3A ~ DHE0.3M	14
FR151 ~ FR157	6	DHE0.5A ~ DHE0.5M	14
FR201 ~ FR207	6	DHE1A ~ DHE1M	14
FR251 ~ FR257	6	MAHE0.5A ~ MAHE0.5M	14
FR301 ~ FR307	6	MAHE1A ~ MAHE1M	14
FR601 ~ FR607	7	MAHE2A ~ MAHE2M	15
1N4933 ~ 1N4937	7	US1A ~ US1M	15
1N4942 ~ 1N4948	7	US2A/SMA ~ US2M/SMA	15
BA157 ~ BA159	7	US2A ~ US2M	15
SM4933 ~ SM4937	7	US3A/SMB ~ US3M/SMB	15
		US3A ~ US3M	16
		US5A ~ US5M	16

## PRODUCT CATALOG

超快恢复整流二极管		SB320 ~ SB3100		24
Super Fast Rectifiers		SB520 ~ SB5100		24
SF11 ~ SF18	17	SR120 ~ SR1100		24
SF21 ~ SF28	17	SR220 ~ SR2100		24
SF31 ~ SF38	17	SR520 ~ SR5100		25
SF61 ~ SF68	17	SMS120 ~ SMS1A0		25
MUR405 ~ MUR460	18	SM5817 ~ SM5819		25
MUR805 ~ MUR860	18	SMS220 ~ SMS2A0		25
MUR1005CT ~ MUR1040CT	18	SR820 ~ SR860		26
MUR1605CT ~ MUR1660CT	18	SR1020 ~ SR10150		26
MUR2010CT ~ MUR2060CT	18	SR1620 ~ SR16150		26
MUR3005WT ~ MUR3060WT	18	SR2020 ~ SR20150		26
		SR2520 ~ SR25150		27
		SR3020 ~ SR30150		27
Surface Mount Super Fast Rectifiers		Surface Mount schottky Barrier Rectifiers		
DSF0.3A ~ DSF0.3J	19	DSK12 ~ DSK120	28	
DSF0.5A ~ DSF0.5J	19	DSL12 ~ DSL14	28	
DSF1A ~ DSF1J	19	DSL22 ~ DSL26	28	
MASF0.5A ~ MASF0.5J	19	DSK22 ~ DSK220	28	
MASF1A ~ MASF1J	19	MASK12 ~ MASK110	29	
MASF2A ~ MASF2J	20	MASL12 ~ MASL14	29	
ES1A~ES1J	20	MASK22 ~ MASK210	29	
ES2A/SMA ~ ES2J/SMA	20	MASL22 ~ MASL24	29	
ES1A/SMB ~ ES1J/SMB	20	MASK32 ~ MASK320	29	
ES2A ~ ES2J	21	MASL32 ~ MASL34	29	
ES3A/SMB ~ ES3J/SMB	21	SS12 ~ SS120	30	
ES5A/SMB ~ ES5J/SMB	21	SL12 ~ SL16	30	
ES3A ~ ES3J	21	SS22 ~ SS220	30	
ES5A ~ ES5J	21	SL22 ~ SL26	31	
		SS32 ~ SS320	31	
High Voltage Rectifiers		SL32 ~ SL36	31	
PR1000 ~ PR1800	22	SK12 ~ SK120	32	
R1200 ~ R5000	22	SK22 ~ SK220	32	
R1200F ~ R5000F	22	SL22/SMB ~ SL24/SMB	32	
HVM5 ~ HVM16	22	SK32/SMB ~ SK320/SMB	32	
EM513 ~ EM518	22	SK42/SMB ~ SK420/SMB	33	
		SK52/SMB ~ SK520/SMB	33	
Schottky Barrier Rectifiers		SL52/SMB ~ SL56/SMB	33	
1S20 ~ 1S100	23	SK32/SMC ~ SK320/SMC	34	
1N5817 ~ 1N5819	23	SK42/SMC ~ SK420/SMC	34	
SB120 ~ SB1100	23	SK52/SMC ~ SK520/SMC	34	
SB220 ~ SB2100	23	SK82/SMC ~ SK820/SMC	35	
1N5820 ~ 1N5822	23	SK102/SMC ~ SK1020/SMC	35	
		SR1045L ~ SR10150L	35	



## PRODUCT CATALOG

MP13N50 ~ MP20N50	104	2N5551	107
MF830 ~ MF840	104	A42	107
MF13N50 ~ MF20N50	104	A44	107
MF830 ~ MF840	104		
MF13N50 ~ MF20N50	104	PNP Transistor	
MB830 ~ MB840	104	8550S	107
MU5N50	104	S8550	107
MD5N50	104	S9012	107
MD840	104	8550SS	107
MP2N60 ~ MP12N60	104	SS8550	107
MF2N60 ~ MF20N60	105	2N3906	107
MN1N60	105	S9015	107
MI2N60 ~ MI20N60	105	A733	107
MB4N60 ~ MB7N60	105	A1015	107
MU1N60 ~ MU5N60	105	2N5401	107
MD1N60 ~ MD7N60	105	A92	107
MF2N65 ~ MF16N65	105	A94	107
MI4N65	106		
MB7N65 ~ MB10N65	106	NPN Switch Transistor	
MU4N65	106	3DD13001 ~ 3DD13002 / TO-92	108
MD2N65 ~ MD7N65	106	3DD13002B / TO-92	108
MF2N70 ~ MF6N70	106	3DD13002 ~ 3DD13003 / TO-126	108
MU4N70 ~ MU6N70	106	3DD13003 ~ 3DD13007 / TO-220AB	108
MD4N70 ~ MD6N70	106		
MP7N80	106	晶闸管	
MF3N80 ~ MF10N80	106	Thyristor	
MI7N80	106	PCR606	109
MB7N80	106	MCR100-8	109
MU4N80	106	MAC97A8	109
MD3N80	106	2P4M	109
MU3N80	106	BT134	109
		BT136	109
		BT137	109
		BT138	109
		BT151	109
		稳压器	
		Voltage Regulators	
		TL431	110
		LM78L05	110
		LM78L06	110
		LM78M08	110
		LM78M12	110
		ABD <sup>a)</sup> for ESD Protection	
		ESD3.3V3DU ~ ESD36V3DU	113
		ESD03V3DB ~ ESD48V3DB	113
		ESD03V3DU-LC ~ ESD12V3DU-LC	114
		ESD03V3DB-LC ~ ESD36V3DB-LC	114
		Note a)	
		ABD = Avalanche Breakdown Diode	
NPN Transistor			
S9018	107		
D965	107		
SS8050	107		
8050S	107		
8050SS	107		
S8050	107		
S9013	107		
D882	107		
2N3904	107		
S9014	107		
C1815	107		
C945	107		
Small Signal Fast Switching Diode			
1N4148WS ~ 4448WS	111		
1N914BWS	111		
BAV19WS ~ BAV21WS	111		
1SS355	111		
Small Signal Schottky Diode			
1SS315 ~ 1SS373	112		
1N5817WS ~ 5819WS	112		
SD103AWS ~ 103BWS	112		
BAT54WS ~ 42WS	112		
RB500V-40 ~ 751V-40	112		
RB551V-30	112		

## MOSFET

Part NO.	I <sub>D</sub> (A)	V <sub>DSS</sub> (V)	R <sub>DS(ON)</sub> (Ω)	Package
2N60	2	600	4.5	TO-251,252,220F
2N65	2	650	5.0	TO-251,252,220F
2N70	2	700	6.5	TO-251,252,220F
2N80	2	800	6.7	TO-220F
3N80	3	800	4.8	TO-251,252,220F ..
4N40	4	400	2.0	TO-251,252,220F
4N60	4	600	2.5	TO-251,252,220F,262,262
4N65	4	650	2.8	TO-251,252,220F,262,263
4N70	4	700	3.0	TO-220F
4N80	4	800	3.6	TO-251,252,220F
4N90	4	900	4.2	TO-220C,220F
5N20	5	200	0.5	TO-251,252,220F
5N40	5	400	1.1	TO-251,252,220F
830	5	500	1.5	TO-251,252,220F
5N60	5	600	2.5	TO-251,252,220F
5N65	5	650	2.8	TO-251,252,220F
730	6	400	1.0	TO-220C,220F
6N60	6	600	1.5	TO-251,252,220F
6N65	6	650	1.6	TO-251,252,220F
7N60	7	600	1.25	TO-220F
7N65	7	650	1.3	TO-220F
7N80	7	800	1.9	TO-220F

## MOSFET

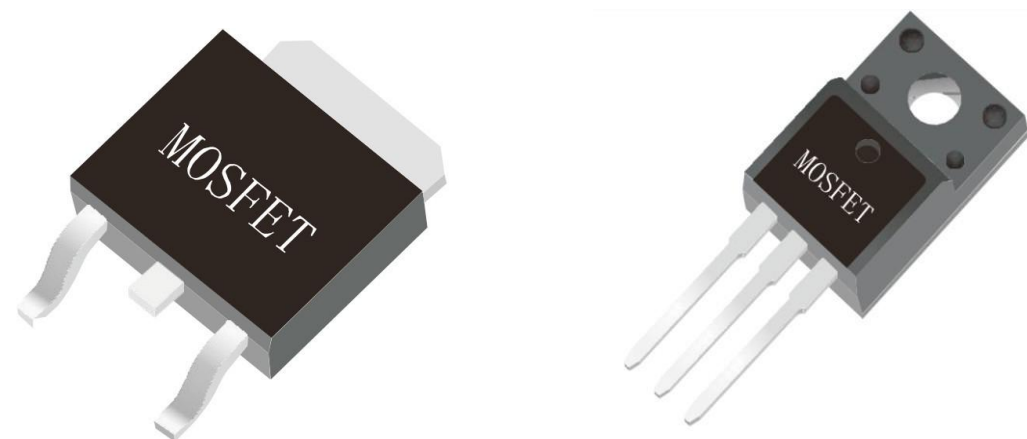
Part NO.	IF (A)	VRRM (V)	VF (0)	Package
8N65	8	650	1.2	TO-220F
8N70	8	700	1.3	TO-220F
630	9	200	0.28	TO-251,252,220F
9N90	9	900	1.4	TO-247
10N20	10	200	0.28	TO-251,252,220 .
740	10	400	0.5	TO-220C,220F
10N50	10	500	0.60	TO-220F .....
10N60	10	600	0.75	TO-220F
10N65	10	650	0.80	TO-220F
10N70	10	700	1.2	TO-220F....
10N80	10	800	1.1	TO-220F
11N90	11	900	1.1	TO-220F,247
12N60	12	600	0.65	TO-220F
12N65	12	650	0.7	TO-220F
12N70	12	700	0.75	TO-220F
13N50	13	500	0.48	TO-220F
13N65	13	650	0.52	TO-220F
13N90	13	900	1.2	TO-247
15N50	15	500	0.4	TO-220F
16N50	16	500	0.35	TO-220F

## MOSFET

Part NO.	IF (A)	VRRM (V)	VF (0)	Package
2N65//65R2K2	2	650	2.20	TO-251,252,220F
4N60//60R840	4	600	0.84	TO-251,252,220F
4N65//65R940	4	650	0.94	TO-251,252,220F
4N70//70R1K5	4	700	1.50	TO-251,252,220F
7N60//60R580	7	600	0.58	TO-251,252,220F
7N65//65R600	7	650	0.60	TO-251,252,220F
7N70//70R700	7	700	0.70	TO-251,252,220F
11N60//60R350	11	600	0.35	TO-251,251,220F
11N65//65R380	11	650	0.38	TO-251,252,220F
11N70//70R450	11	700	0.45	TO-251,252,220F
15N60//60R230	15	600	0.23	TO-262,263,220F
15N65//65R280	15	650	0.28	TO-262,263,220F
15N80//80R300	15	800	0.30	TO-262,263,220F
15N90//90R350	15	900	0.35	TO-220C,220F
18N80//80R250	18	800	0.25	TO-262,263,220C,220F
20N50//50R120	20	500	0.12	TO-263,220C,220F,247
20N60//60R190	20	600	0.19	TO-263,220C,220F,247
20N65//65R210	20	650	0.21	TO-263,220C,220F,247
20N70//70R270	20	700	0.27	TO-263,220C,220F,247

## Low VOL M O S

Part NO.	IF (A)	VRRM (V)	VF (0)	Package
60N03	60	30	0.004	TO-220C
100N03T	100	30	0.004	TO-220C
100N03	120	35	0.004	TO-220C
1404T	150	40	0.004	TO-220C
1404P	180	40	0.004	TO-220C
1404	230	40	0.004	TO-220C
15N06	15	60	0.05	TO-220C
20N06	20	60	0.04	TO-220C
50N06	50	60	0.016	TO-220C
3205	130	60	0.005	TO-220C
75N75T	80	60	0.007	TO-220C
75N75P	75	80	0.007	TO-220C
75N75	100	80	0.007	TO-220C
3710	65	100	0.02	TO-220C
4610	73	100	0.005	TO-220C



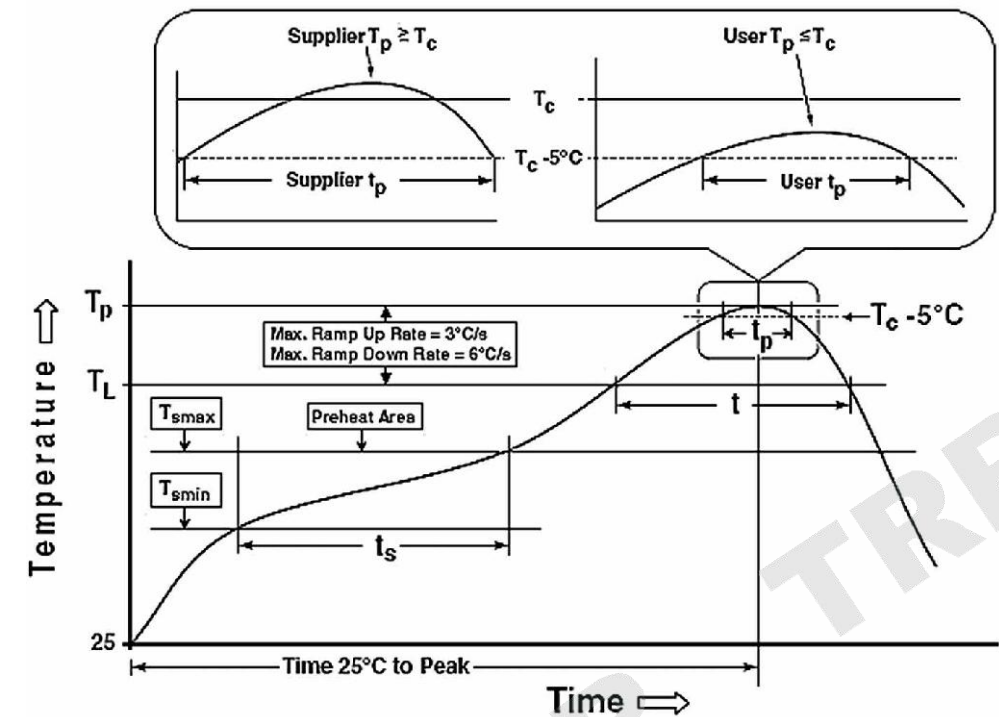
## Low VOL M O S

Part NO.	IF (A)	VRRM (V)	VF (0)	Package
MBR1040	2*5	40	0.58	TO-220C,220F
MBR1045	2*5	45	0.60	TO-220C,220F
MBR2045	2*10	45	0.60	TO-220C,220F
MBR1060	2*5	60	0.75	TO-220C,220F
MBR2060	2*10	60	0.75	TO-220C,220F
MBR3060	2*15	60	0.75	TO-220C,220F
MBR10100	2*5	100	0.85	TO-220C,220F
MBR10150	2*5	150	0.90	TO-220C,220F
MBR10200	2*5	200	0.92	TO-220C,220F
MBR20100	2*10	100	0.85	TO-220C,220F
MBR20150	2*10	150	0.90	TO-220C,220F
MBR20200	2*10	200	0.92	TO-220C,220F
MBR30100	2*15	100	0.85	TO-220C,220F
SBR10U100	2*5	100	0.68	TO-220C,220F
SBR10U150	2*5	150	0.75	TO-220C,220F
SBR10U200	2*5	200	0.78	TO-220C,220F
SBR20U100	2*10	100	0.68	TO-220C,220F
SBR20U150	2*10	150	0.74	TO-220C,220F
SBR20U200	2*10	200	0.67	TO-220C,220F
SBR30U100	2*15	100	0.65	TO-220C,220F
MUR1040	10	400	1.20	TO-220C,220F
MUR1060	10	600	1.30	TO-220C,220F



Part No.	Package	Technology	BV	ID(A) @TC= 25°C	VthTyp(V)	Ron(mΩ) typ@1 0V	Ron (mΩ) max@ 10V	APP
LM120N08S3	TO-20	SGT Gen1	80	120	3	4.7	5.5	Motor Controller
LM120N08S2	TO-263	SGT Gen1	80	120	3	4.5	5.2	Li -battery
LM90N08S8	DFN56	SGT Gen1	80	90	3	4.8	5.5	Power Supply
LR041N08SA3	TO-20	SGT Gen1	80	120	3	3.5	4.1	Motor Controller
LR038N08SA2	TO-263	SGT Gen1	80	120	3	3.2	3.8	Li -battery
LR065N08S3	TO-20	SGT Gen1	80	80	3	5.4	6.5	Motor Controller
LR067N08S8	DFN56	SGT Gen1	80	80	3	5.5	6.7	Power Supply
LR02 N08S3	TO-20	SGT Gen1	80	120	3	1.8	2.2	Motor Controller
LR020N08S0	TO-263-7	SGT Gen1	80	120	3	1.5	2	Li -battery
LR02 N08S1	TO-247	SGT Gen1	80	120				
A04 07	SOP8	P	-12	-1.36	1	14.3		
L2302	SOT23-3L	N	4.5	0.65	24	31		
LM90N03T8	DFN56	N	90	1.6	4.1	4.9		
LM150N03T4	TO252双芯	N	150	1.7	3	3.9		Electric Tools
LM150N03T8	DFN56	N	150	1.6	3	3.9		Electric Tools

## Application Note For SMD Recommended Pb-Free Solder Heating Profiles



Profile Feature	Pb-Free Assembly
Preheat / Soak	
Temperature Min ( $T_{smin}$ )	150 °C
Temperature Max ( $T_{smax}$ )	200 °C
Time ( $t_s$ ) from $T_{smin}$ to $T_{smax}$	60 -120 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3° C / second max.
Liquidous Temperature ( $T_L$ )	217 °C
Time ( $t_l$ ) maintained above $T_L$	60 -150 seconds
Peak package body Temperature ( $T_p$ ) <sup>a)</sup>	260 °C
Time within 5 °C of actual Peak Temperature ( $t_p$ )	30 seconds
Ramp-Down Rate	6 °C / second max
Time 25 °C to Peak Temperature	8 minutes max.

### Notes

- $T_p$  is defined as a supplier minimum and a user maximum, see also J-STD-020E Table 5-2.
- $T_c$  is Classification Temperatures, see also J-STD-020E Table 4-2.
- Reference J-STD-020E, Moisture Reflow Sensitivity Classification for Nonhermetic Surface Mount Devices "

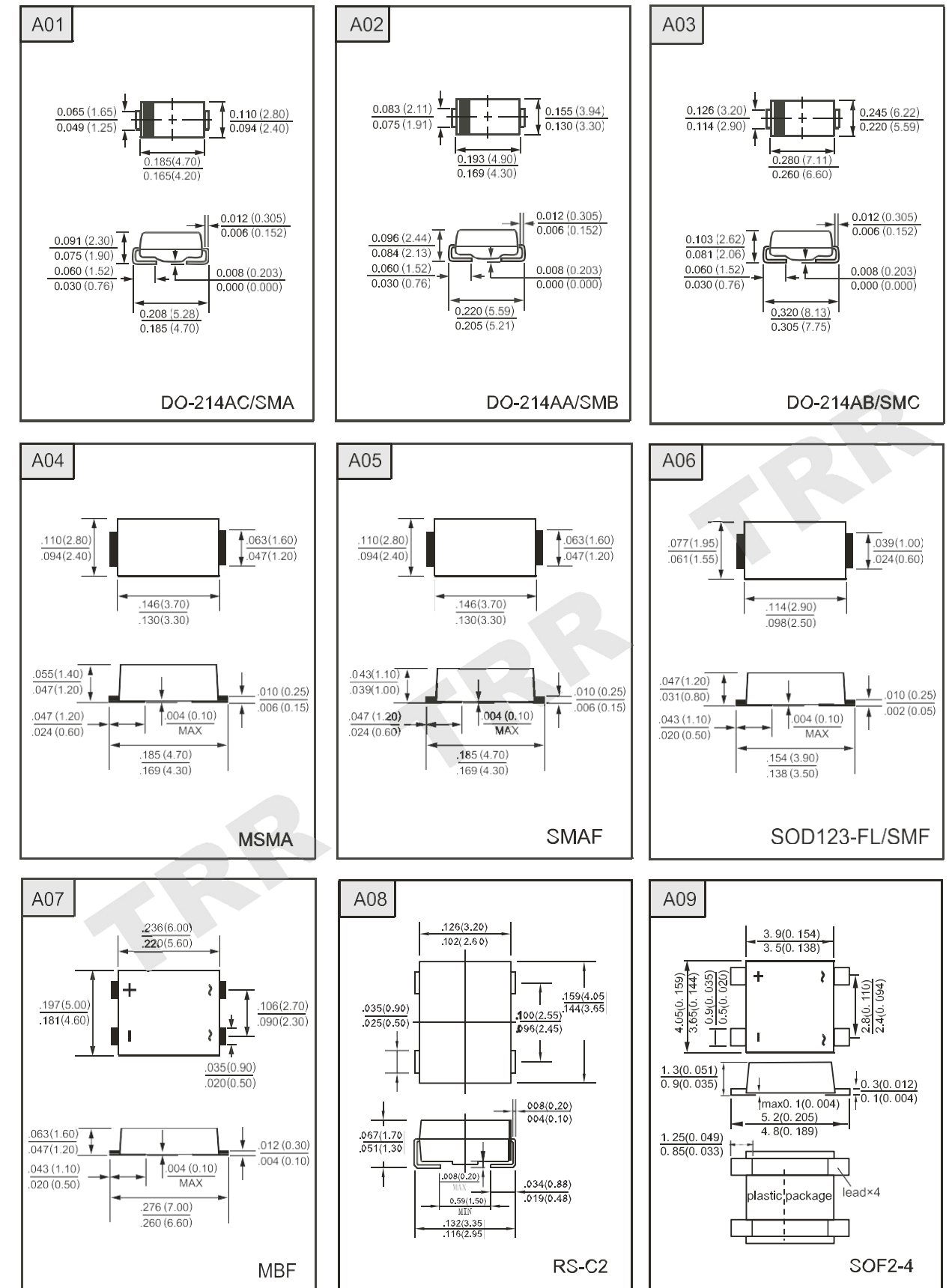
# HIGH RELIABILITY EXPERIMENT LIST

2016Edition

NO.	实验项目 Experiment item	简称 Abrv	实验条件 Experiment Conditions	时间或周期 Time or Cycle	参考标准 Reference
1	高温反向偏压 High Temperature Reverse Bias Test	HTRB	① $T_A = 125 \pm 5^\circ\text{C}$ for O/J ② $T_A \geq 125 \pm 5^\circ\text{C}$ for Gpp ③ $T_A \geq 100 \pm 5^\circ\text{C}$ for Sky Bias = $80\%V_{RRM}$ for Rectifier Bias = $V_{WM}$ for TVS Bias = $V_R$ for Zener	48/96/168 H	MIL-STD-750F METHOD-1038
2	稳态工作寿命 Steady-state Operation Life	SOL	Rated average rectifier current $I_o = I_{F(AV)}$ @ $T_A = 25^\circ\text{C}$	168/1000 H	MIL-STD-750F METHOD-1027
3	高温贮存 High Temperature Life	HTL	$T_A = 150 \pm 5^\circ\text{C}$	168/1000 H	MIL-STD-750F METHOD-1031
4	间歇性工作寿命 Intermittent Operation Life	IOL	ON = 5Min with rated $I_o$ , OFF = 5Min with cool forced air	1000 CYCLE	MIL-STD-750F METHOD-1036
5	温度循环 Temperature Cycling (air to air)	TC	$T_H = 150+3/-0^\circ\text{C}$ 10Min $T_L = -55+0/-3^\circ\text{C}$ 10Min Transfer time = 5Min	10 CYCLE	MIL-STD-750F METHOD-1051
6	热冲击 Thermal Shock	TS	$0^\circ\text{C} / 5\text{min}$ $100^\circ\text{C} / 5\text{min}$	10 CYCLE	MIL-STD-750F METHOD-1056
7	耐焊接热 Soldering Heat	SH	$260 \pm 5^\circ\text{C}$	10 SEC	MIL-STD-750F METHOD-2031
8	引脚拉力 Lead Pull	—	1Kg in axial lead direction	10 SEC	MIL-STD-750F METHOD-2036
9	引脚疲劳度 Lead Fatigue	—	0.5Kg weight applied to each lead bending are $90 \pm 5^\circ$	3 TIMES	MIL-STD-750F METHOD-2036
10	正向浪涌电流 Forward Surge Current	—	8.3mS or 10mS single half sine-wave superimposed on rated load	1 PULSE	MIL-STD-750F METHOD-4066
11	高压锅 Autoclave	AC	$T_A = 121 \pm 2^\circ\text{C}$ $P = 29.7/15 \text{ Psia}$ or $P = 205/102 \text{ Kpa}$ RH = 100%	4 / 8 / 16 / 24 H	JESD22-A102D
12	可焊性 Solderability	SD	$245 \pm 5^\circ\text{C}$	10 SEC	MIL-STD-750F METHOD-2026

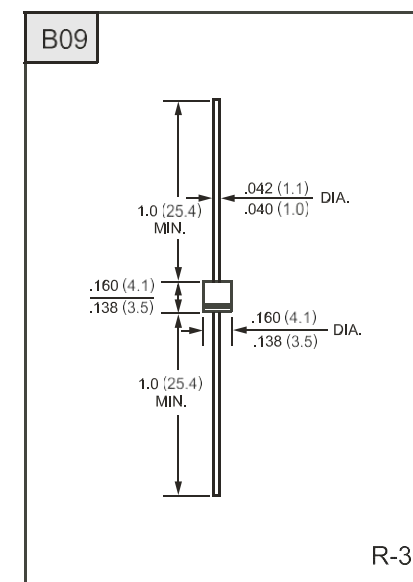
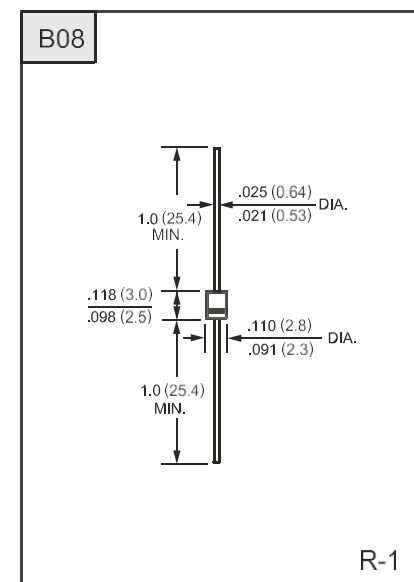
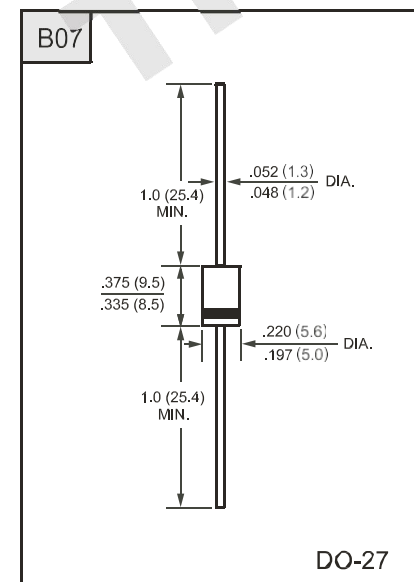
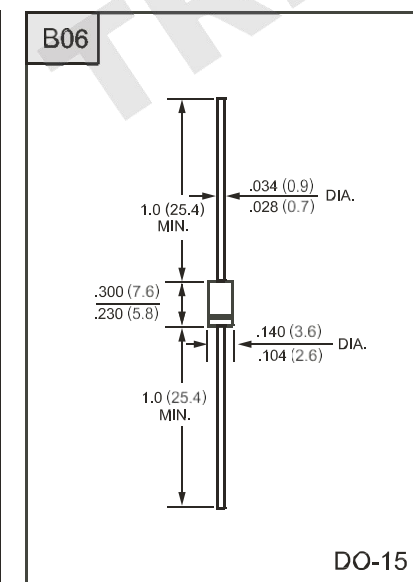
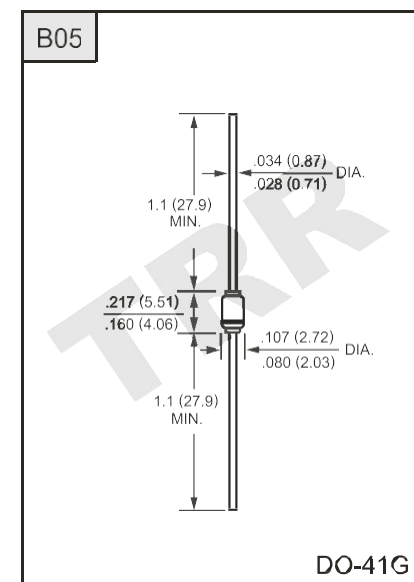
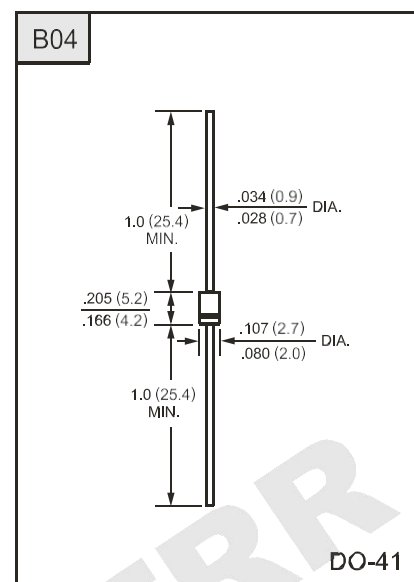
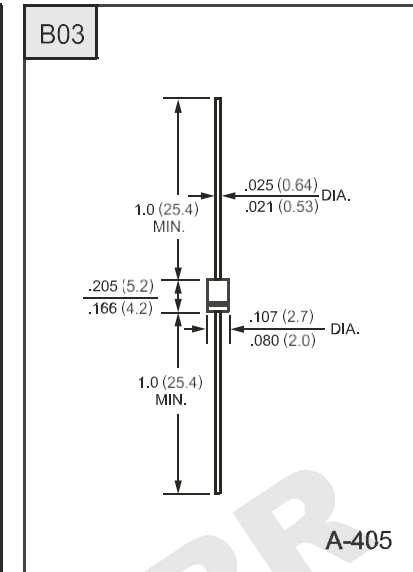
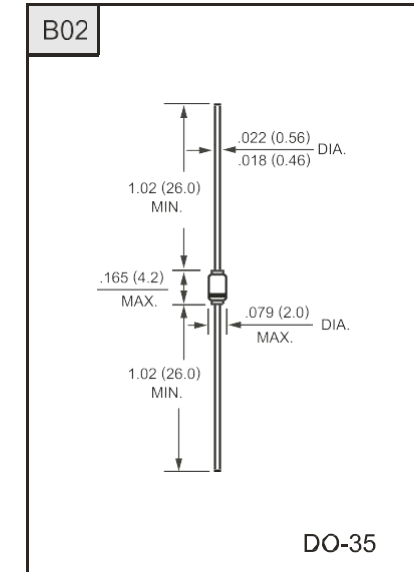
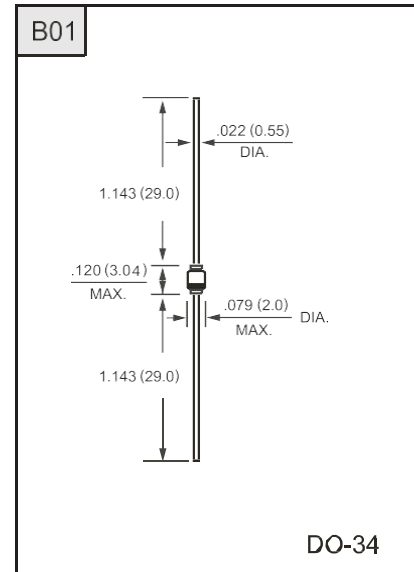
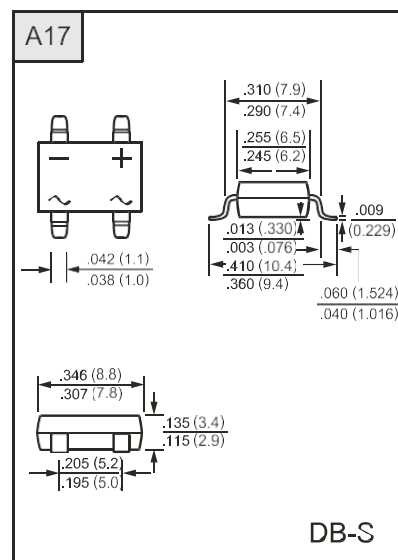
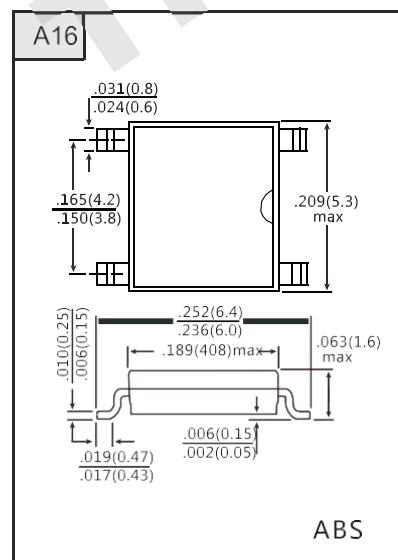
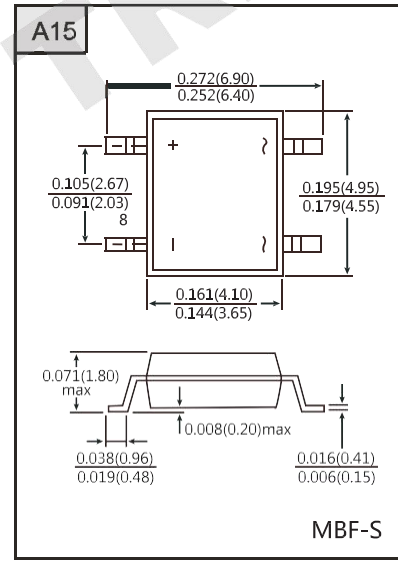
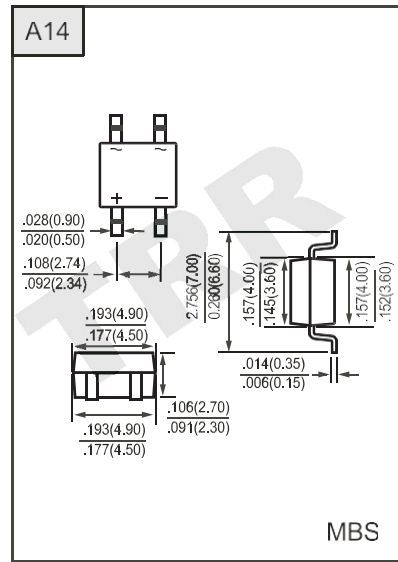
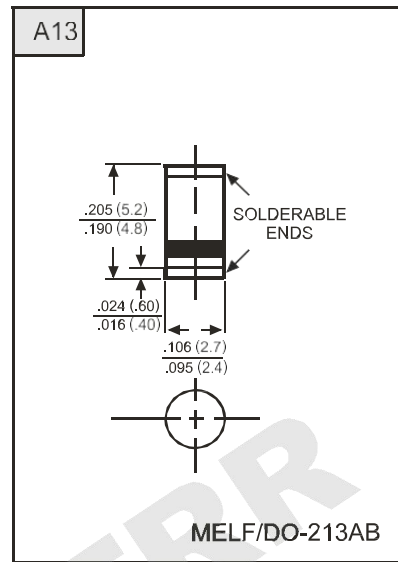
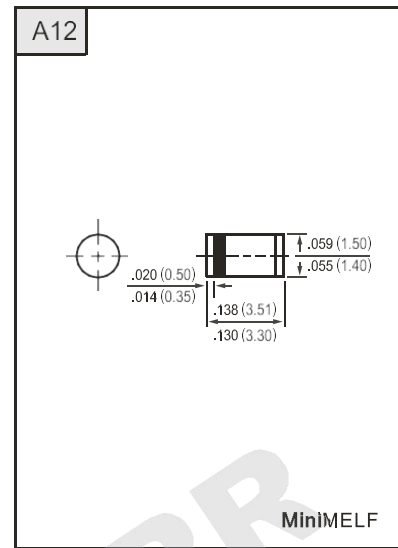
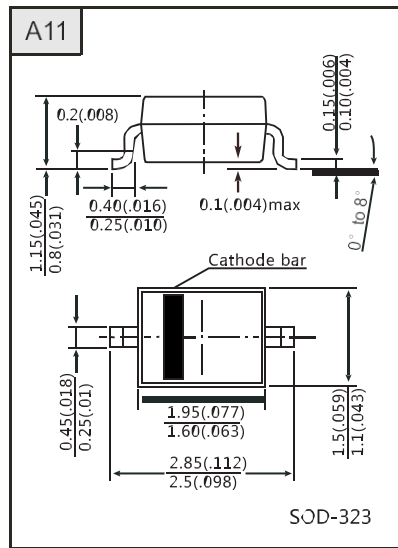
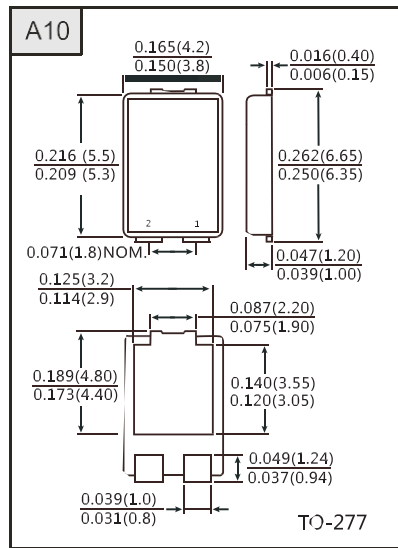
## Outline Drawings

Unit: inch (mm)



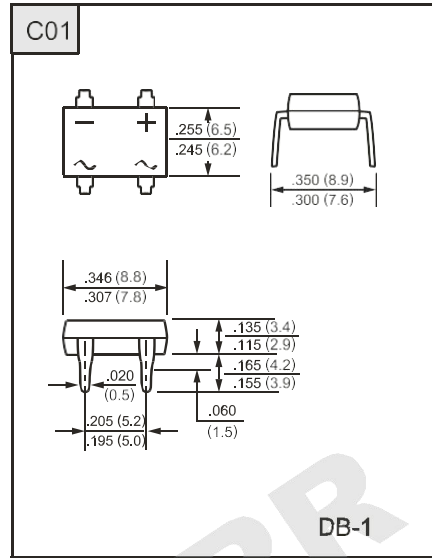
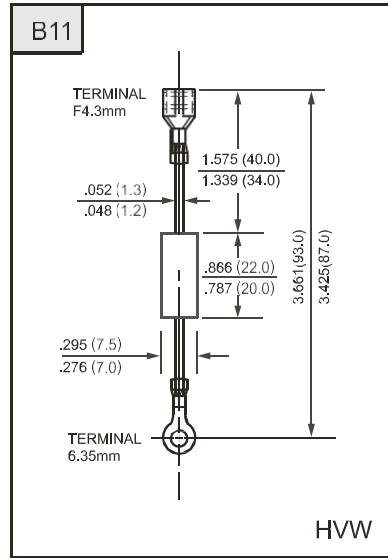
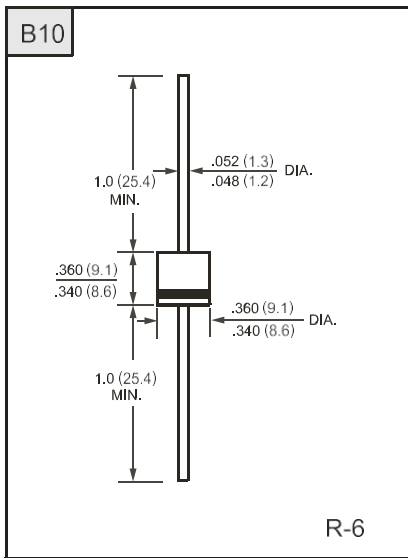
# Outline Drawings

Unit: inch (mm)



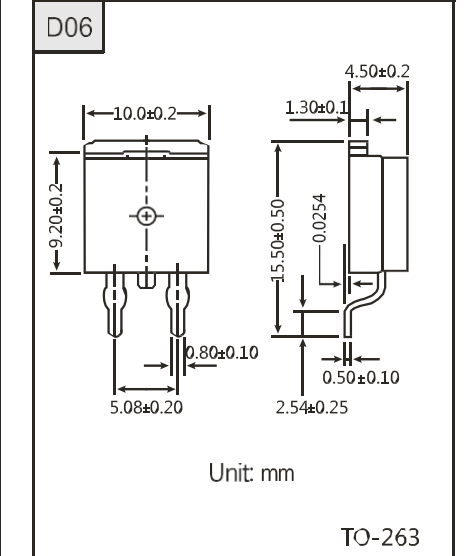
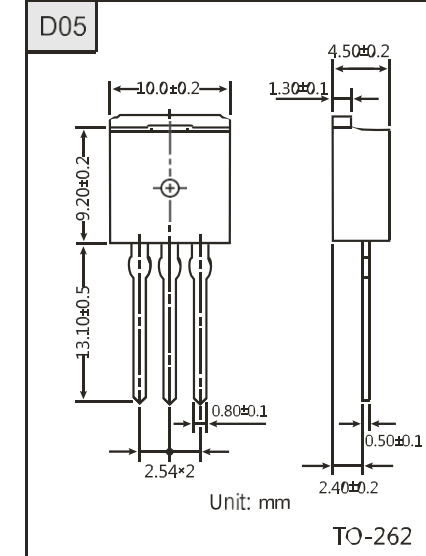
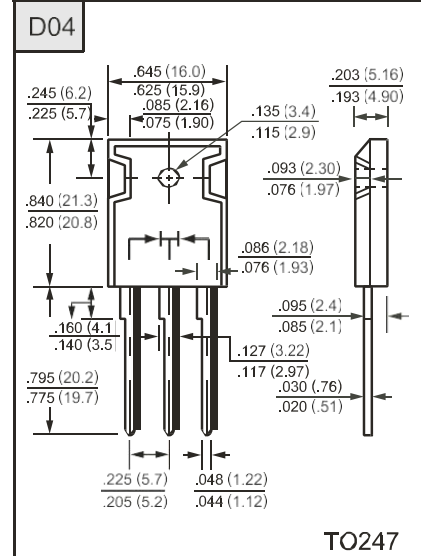
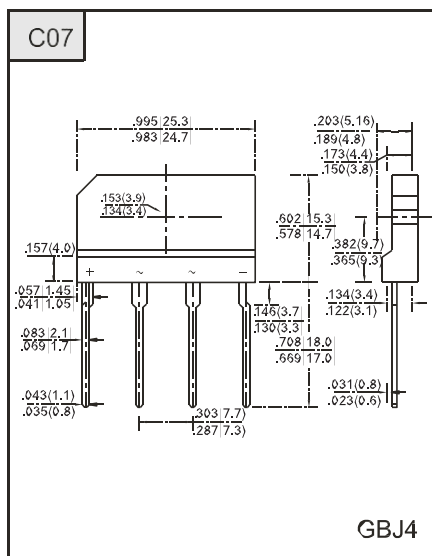
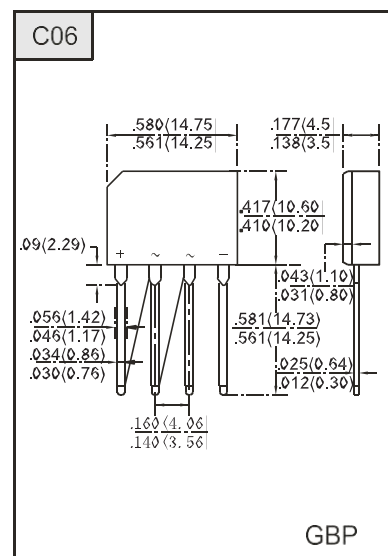
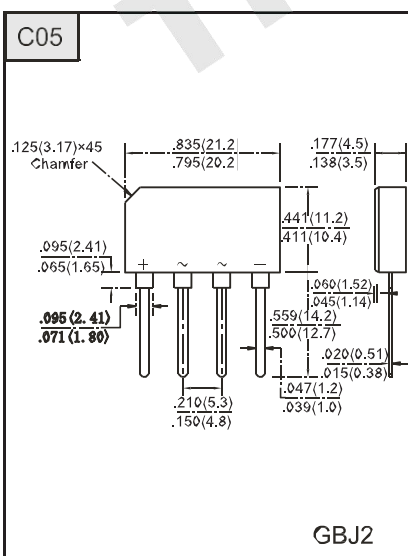
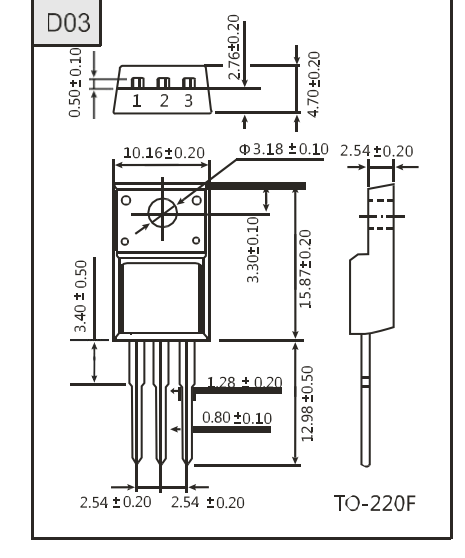
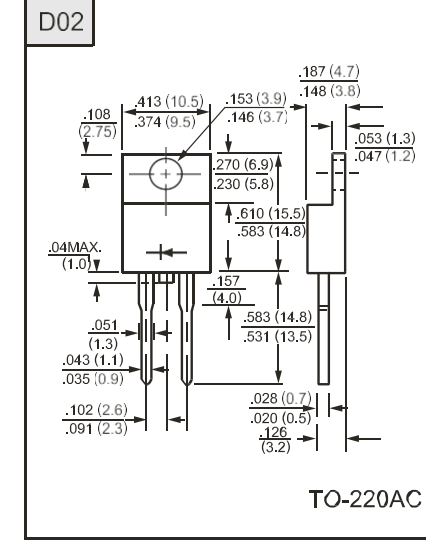
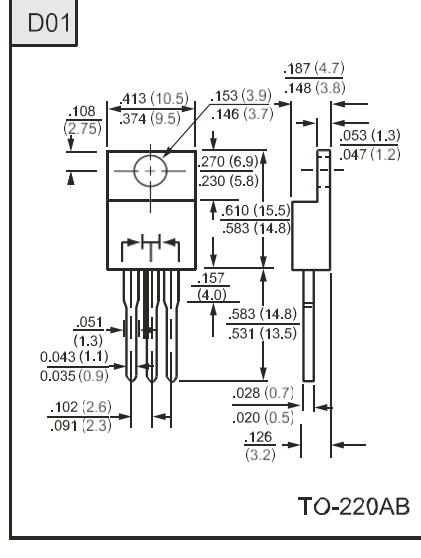
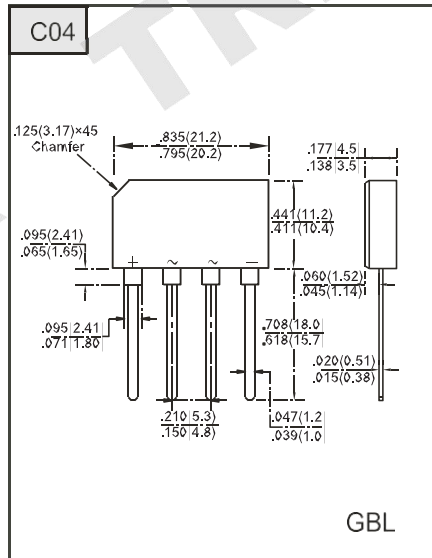
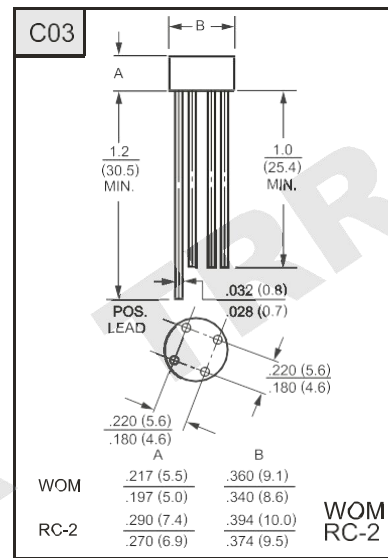
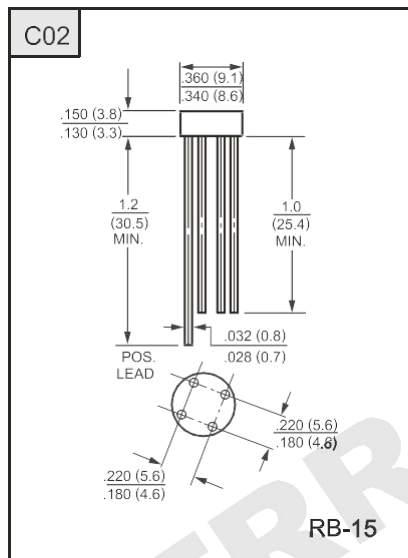
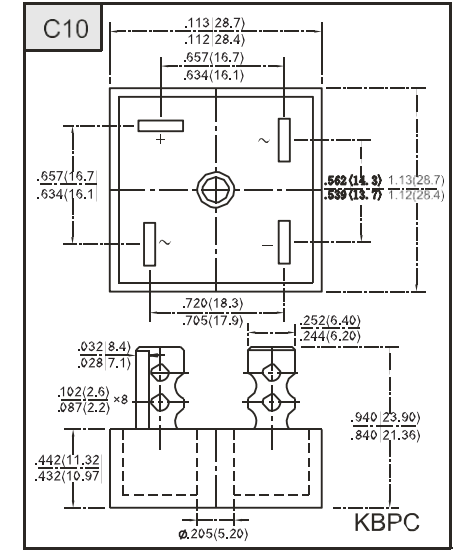
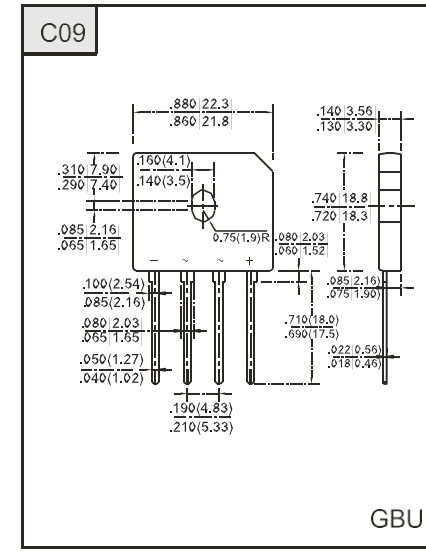
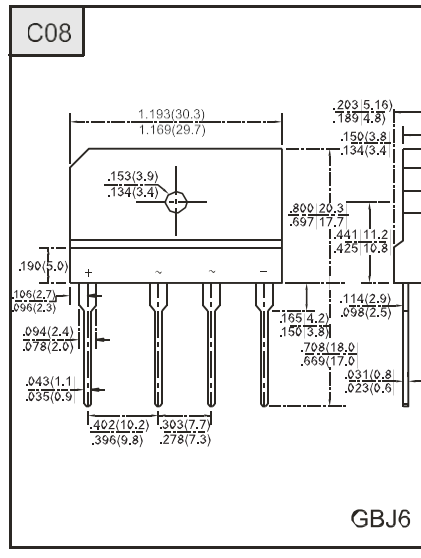
# Outline Drawings

Unit: inch (mm)



# Outline Drawings

Unit: inch (mm)



Unit: mm

Unit: mm