

BRITISH STANDARDS INSTITUTION

2, PARK STREET, LONDON, W1A 2BS

Specification available from:— AS SHOWN IN PD 9002,
CECC 00200 AND

Westcode Semiconductors,
Westinghouse Brake & Signal Co. Ltd.,
CHIPPENHAM, Wilts, SN15 1JL
Tel. 0249 4141 Telex 44751

ELECTRONIC COMPONENTS OF ASSESSED QUALITY
DETAIL SPECIFICATION IN ACCORDANCE WITH

BS CECC 50 000 : 1977

BS CECC 50009-D17

Issue 1

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MANUFACTURER'S TYPE NUMBER

GN31, GN40, GN55
GR31, GR40, GR55

See PD 9002 and CECC 00200

For ordering information
see page 4

CASE RATED SILICON
RECTIFIER DIODE

30, 40 & 55 Amps

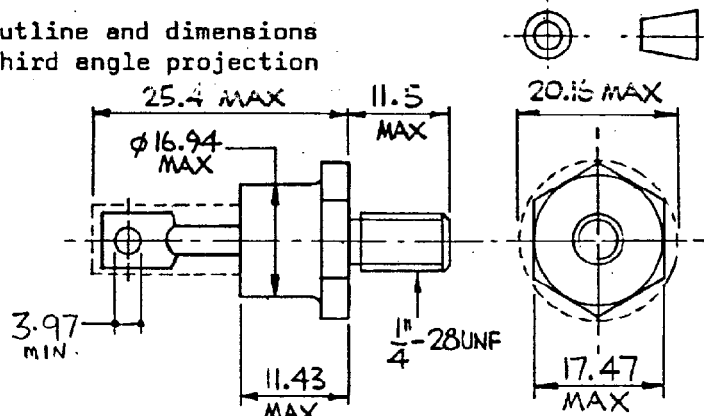
200 to 1200 volts

STUD MOUNTED

HERMETICALLY SEALED

ASSESSMENT LEVEL F

Outline and dimensions
Third angle projection



Outline BS 3934, SO-13

All dimensions in millimetres

Marking information see page 3

4. LIMITING VALUES

Absolute maximum values which apply over the operating temperature range,
(see 4.3), unless otherwise stated.

4.1 Voltage Ratings

- 4.1.1 Crest working reverse voltage
- 4.1.2 Repetitive peak reverse voltage
- 4.1.3 Non-repetitive peak reverse voltage
- 4.1.4 Continuous (dc) reverse voltage

V_{RWM}
 V_{RRM}
 V_{RSM}
 V_R

TABLE 1 VOLTAGE RATINGS

TYPE NUMBER	$V_{RWM}(V)$	$V_{RRM}(V)$	$V_{RSM}(V)$	$V_R(V)$
S2GNxx : S2GRxx	180	200	300	140
S4GNxx : S4GRxx	360	400	500	260
S6GNxx : S6GRxx	540	600	700	420
S8GNxx : S8GRxx	720	800	900	560
S10GNxx : S10GRxx	900	1000	1100	700
S12GNxx : S12GRxx	1080	1200	1300	810

x = Current rating, see Table 2

Note: Normal polarity, (Stud cathode), S2GN31 to S12GN55
Reverse polarity (Stud anode), S2GR31 to S12GR55

Refer to Qualified Products List PD 9002 and/or CECC 00200 for details of manufacturers
approved to this specification.

4.2 Current Ratings (See Table 2).

4.2.1 Mean forward current at the breakpoint temperature
(See figs. 1,3 or 5), sinusoidal waveform, 180° conduction
angle, with resistive load. $I_F(AV)$

4.2.4.1 Non-repetitive peak forward surge current,
 $T_{case} = 150^{\circ}C$, Duration = 10ms with re-application of
60% V_{RRM} I_{FSM1}

4.2.4.2 Non-repetitive peak forward surge current,
 $T_{case} = 150^{\circ}C$, without re-application of
reverse voltage I_{FSM2}

4.2.5 RMS forward current,
for derating curves of $I_F(AV)$ against T_{case} ,
see Figures 1, 3 & 5. $I_F(RMS)$

TABLE 2 CURRENT RATINGS

Col.1	2	3	4	5
TYPE NO.	$I_F(AV)$ (Amps)	$I_{FSM(1)}$ (Amps)	$I_{FSM(2)}$ (Amps)	$I_F(RMS)$ (Amps)
SxGN31 : SxGR31	30	410	470	47
SxGN40 : SxGR40	40	540	620	63
SxGN55 : SxGR55	55	750	860	86

x = Voltage grade. See Table 1

4.3 Temperature Ratings

4.3.1 Maximum case temperature at which the above voltage
ratings apply. $T_{case} 150^{\circ}C$

4.3.2 Minimum and maximum virtual junction temperatures at
which the above voltage and current ratings apply $T_{(vj)} -55^{\circ}C$ min.
150°C max.

4.3.3. Minimum and maximum storage temperatures $T_{stg} -55^{\circ}C$ min.
150°C max.

4.4 Mechanical Ratings

4.4.1 Maximum permissible torque on nut 4.7Nm

4.4.2 Recommended torque on nut for good thermal contact 4.4Nm

4.4.3 Minimum permissible torque on nut for good thermal contact 4.1Nm

5. ELECTRICAL CHARACTERISTICS (see Table 3)

All characteristics at $T_{case} = 25^{\circ}C$ unless otherwise stated

- 5.1 Maximum peak forward voltage at breakpoint temp. see Figs. 1, 3 & 5 at I_{FM} corresponding to π times $I_F(AV)$ see Table 3 V_{FM} Table 3 col.4
- 5.2.1 Maximum peak reverse current at V_{RRM} from Table 1 without forward dissipation I_{RM1} 1mA
- 5.2.2 Maximum peak reverse current at V_{RRM} from Table 1 $T_{case} = 150^{\circ}C$ without forward dissipation I_{RM2} 8mA
- 5.3 Total power dissipation (for derating curves see figure 1, 3 & 5) P_{tot} 100watts
- 5.5 Maximum thermal resistance, junction to case for d.c. current) R_{th} $0.68^{\circ}C/W$

TABLE 3 ELECTRICAL CHARACTERISTICS

Col. 1	2	3	4
Type No.	$I_{FM}(Amps)$	$I_F(AV)(Amps)$	$V_{FM}(V)$
SxGN or GR 31	94	30	1.20
SxGN or GR 40	126	40	1.31
SxGN or GR 55	173	55	1.45

x = Voltage grade, see Table 1

MARKING

- (1) Each rectifier diode shall bear the following marking:-
- The diode arrow graphical symbol pointing towards the cathode
 - The type number
 - The factory identification code
- (2) Each package containing one or more of these rectifiers shall bear markings b and c above and in addition:-
- The date code
 - The BS CECC detail specification number

RELATED DOCUMENTS

IEC 191/2, Mechanical standardisation of semiconductor devices,
BS 3934, Dimensions of semiconductor devices
BS 6001, Sampling procedures and tables for inspection by attributes
BS E9000 General requirements of electronic components of assessed
quality harmonised with the Genelec Electronic Components
Committee system.
PD 9002, BS 9000 component selection guide
CECC 00200, Qualified product list
BS CECC 50 000, Generic specification for discrete semiconductor devices

ORDERING INFORMATION

Orders for these diodes shall state:-

1. Quantity
2. Manufacturer's type number, (see Tables 1 & 2)
3. This BS CECC detail specification number, issue number and date.

6. TEST CONDITIONS AND INSPECTION REQUIREMENTS

Samples submitted to tests marked (D) shall not be accepted for release (see clause 3.5.6 of BS CECC 50 000). All tests shall be made at $T_{case} = 25 \pm 5^{\circ}C$ unless otherwise stated. Marking must withstand all tests of this specification which might change or damage it, and must remain legible.

TABLE 4 INSPECTION REQUIREMENTS
Group A Lot by Lot

IL = Inspection Level
AQL given in %

Examination or Test	BS CECC 50 000 Ref.	Conditions at $T_{case} = 25^{\circ}C$ unless otherwise specified	Inspection Requirements				
			Limits			IL	AQL
			min.	max.	Units		
<u>Subgroup A1</u>						I	0.65
Visual inspection	4.2.1						
<u>Subgroup A2a</u>						II	0.1
Non operatives	4.3.4 (1)	Open circuit Short circuit I_{FM} as table 3 $T_{case} = 25^{\circ}C$	7	0.7	V V		
<u>Subgroup A2b</u>						II	0.65
Peak forward voltage, V_{FM}	4.3.4 D-041	I_{FM} as table 3 T_{case} =break point temp. see fig.1,3 or 5	-	As table3	V		
Peak reverse current I_{RM1}	4.3.4 D-042	V_{RRM} as Table 1 $f = 50Hz$	-	1	mA		

Group B Lot by Lot

Examination or Test	BS CECC 50 000 ref.	Conditions at $T_{case} = 25^{\circ}C$ unless otherwise specified	Inspection Requirements				
			Limits			IL	AQL
			min.	max.	Units		
<u>Subgroup B1</u>						S-2	2.5
Major dimensions	4.2.2	BS 3934 $\varnothing D$ SD-13 J		20.16 25.40	mm mm		
Permanence of Marking			See Section 6				
<u>Subgroup B2c</u>						S-4	2.5
Non-repetitive peak forward surge current I_{FSM2}	4.3.4. D-043	I_{FSM} as table 2 col.4. One half cycle, $f = 50Hz$ $T_{case} = 150^{\circ}C$					