

BRITISH STANDARDS INSTITUTION
2 PARK STREET
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BS CECC 50 012 - 015

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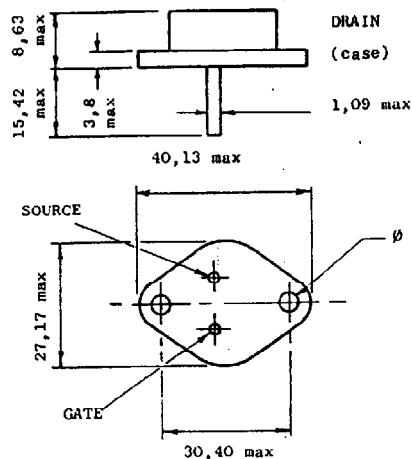


Specification available from:
AS SHOWN IN PD 9002, CECC 00200
AND
INTERNATIONAL RECTIFIER CO (GB) LTD
HURST GREEN, OXTED,
SURREY RH8 9BB.
TEL: 08833 - 3215 TELEX: 95219

ELECTRONIC COMPONENTS OF ASSESSED
QUALITY IN ACCORDANCE WITH:
BS CECC 50 000 - 1981 ISSUE 3

1. MECHANICAL DESCRIPTION

All Dimensions in millimeters



OUTLINES

BS 3934 - SO 127B with SB2 - 2 base

IEC 191-2 - CL1B with B18 base

TERMINAL CONNECTIONS - As outline above

MARKING - As per Type Numbers above

DETAIL SPECIFICATION FOR:

SINGLE GATE FIELD EFFECT TRANSISTORS
P CHANNEL - ENHANCED GATE
TYPE NUMBERS

IRF 9130, 9133

ORDERING INFORMATION

See Clause 7 of this Document

2. SHORT DESCRIPTION

Semiconductor material: Silicon

Encapsulation: Glass /Metal Hermetic

Application: a) Low frequency
amplification
b) Switching

Power: Case rated: 75W @ $T_C = 25^\circ\text{C}$

For Concise Data see Page 2 of this
Document

3. LEVEL OF QUALITY ASSESSMENT

LEVEL E Plus additional tests

WARNING: THESE DEVICES ARE STATIC SENSITIVE



4. LIMITING VALUES (Absolute maximum rating system)

These apply over the operating temperature range unless otherwise stated.

BS CECC 50 012		Symbol	Value		Unit
			min	max	
4.1	Operating case temperature	T_{case}	-55	+150	$^\circ\text{C}$
4.2	Storage temperature	T_{stg}	-55	+150	$^\circ\text{C}$
4.3	Drain - Source voltage at $V_{GS} = 0$	V_{DSS}	-	Table 1	V
4.4	Reverse gate-source voltage at $V_{DS} = 0$	V_{GSR}	-	20	V
4.5	Gate-drain voltage with source open circuit	V_{GDO}	-	+ 20	V
4.7	Continuous Drain current at temperature from -55 to $+90^\circ\text{C}$, then derate linearly to $+150^\circ\text{C}$	I_D	-	Table 1	A
4.7.1	Pulsed drain current	I_{DM}	-	Table 1	A
4.8	Power dissipation (See Power V_S Temperature Curve Clause 9)	P_{tot}	-	75	W

Table 1 LIMITING VALUES

TYPE IRF..	9130	9133
V_{DSS} max (V)	-100	-60
I_D max (A)	-12	-10
I_{DM} max (A)	-48	-40

See relevant Qualified Product List for the availability of components qualified under this detail Specification

CONCISE DATA

Part Numbers	$-V_{DS}$ Drain Source Voltage (Volts)	$r_{DS(ON)}$ On-State Resistance (Ohms)	$-I_D$ Continuous Drain Current (Amps) @ 25 °C Case	I_{DM} Pulsed Drain Current (Amps)	P_{tot} Max. Power Dissipation (Watts)	g_{21s} minimum Transconductance (Siemens)	C_{iss} Typical Input Capacitance (pf)
IRF9130	100	0,3	12,0	48	75	2,0	550
IRF9133	60	0,4	10,0	40			

5. ELECTRICAL CHARACTERISTICS (See clause 8 of this document for Inspection Requirements - Group A to C)

In the following table characteristics marked + in the "Measured" column, are measured in Group A or Subgroup C2.

BS CECC 50 012	Measured	Characteristics and conditions at $T_{\text{case}} = 25^{\circ}\text{C}$, unless otherwise stated.	Symbol	Value		Unit
				min	max	
SECT 1						
5.1	+	Leakage current with drain. short circuit to source at $V_{\text{GSR}} = 20\text{v}$	$I_{\text{GSS}(1)}$	-	-100	nA
5.2	+	Leakage current with drain short circuited to source at $V_{\text{GSR}} = 15\text{V}$ $T_{\text{case}} = 125^{\circ}\text{C}$	$I_{\text{GSS}(2)}$	-	-200	nA
5.5	+	Gate - source threshold voltage at $V_{\text{GS}} = V_{\text{DS}} = 20\text{V}$ $I_{\text{D}} = -250\mu\text{A}$	$-V_{\text{GS}(TO)}$	2,0	4,0	v
5.6	+	On state Drain Current at $-V_{\text{GS}} = 7\text{V}$ $-V_{\text{DS}} = 10\text{V}$	I_{D} IRF9130) IRF9133)	4	29,4	A
5.7	+	Input Capacitance See below. Sect 3 Clause 5.9	$C_{11\text{SS}}$	-	700	pF
5.9	+	Short circuit forward transconductance at $-V_{\text{DS}} = 10\text{V}$ $I_{\text{D}} = -4\text{A}$ Using circuit shown in Appendix I or Automatic Test Equipment e.g. IMPACT	$g_{21\text{s}}$	2,0	7,35	S
				II System		

5. ELECTRICAL CHARACTERISTICS (Continued)

BS CECC 50 012	Measured	Characteristics and conditions at $T_{case} = 25^{\circ}C$, unless otherwise stated.	Symbol	Value		Unit
				min	max	
SECT 3						
5.7	+	Drain cut-off current at $V_{DSS} = \text{See Table I}$ $V_{GS} = 0V$	I_{DSX}		-250	μA
5.8	+	Drain-source on-state voltage at $I_D = -4A$ $V_{GS} = -10V$	$V_{DS(on)}$	IRF 9130 - IRF 9133 -	-1,2 -1,6	V
5.9	+	Small signal, common source, capacitance at $V_{DS} = -25v$ $V_{GS} = 0V$ Input Capacitance Output Capacitance Reverse Transfer Capacitance	C_{11ss} C_{22ss} C_{12ss}	- - -	700 450 200	pF
5.10	+	Switching times at $V_{GS(ON)} = -10V$ $I_D = -4A$ Using the circuit shown in Appendix II Turn on delay time Rise time Fall time Turn off delay time	 $t_{d(on)}$ t_r t_f $t_{d(off)}$	- - - -	60 140 140 140	ns

5. ELECTRICAL CHARACTERISTICS (continued)

BS CECC 50 012	Measured	Characteristics and conditions at $T_{\text{case}} = 25^{\circ}\text{C}$, unless otherwise stated.	Symbol	Value		Unit
				min	max	
<u>SECT</u> 1 & 3 5.11		Thermal resistance, junction to case (all types)	$R_{\text{th(j-case)}}$	-	1,67	K/W
<u>SECT 4</u> 5.6	+	Drain-source on-state resistance IRF 9130 $I_{\text{D}} = -4\text{A}$ $V_{\text{GS}} = -10\text{V}$ IRF 9133 $I_{\text{D}} = -4\text{A}$ $V_{\text{GS}} = -10\text{V}$	$r_{\text{DS(on)}}$ $r_{\text{DS(on)}}$	- -	0,30 0,40	Ω Ω

6. MARKING

Each device shall be marked as follows:

- 1: Type designation eg IRF9130 CECC
- 2: Date Code/Factory identification eg 83 45B/IRO
- 3: Screening Level (if required) eg S/A (i.e. Level A)

In addition, each primary pack shall bear the above marking, plus

- 4: BS CECC 50 012 - 015/E
- 5: "Static sensitive" Warning label

7. ORDERING INFORMATION

The following minimum information is necessary to order a specific device

- i. Precise Type Number eg IRF9130 CECC
- ii. This Specification Number
Issue Number and date
- iii. If required, the appropriate Screening sequence from Appendix VI
of CECC 50 000 eg Screening Sequence A