

BRITISH STANDARDS INSTITUTION
2 PARK STREET
LONDON W1A 2SB

BS CECC 50 012 - 013

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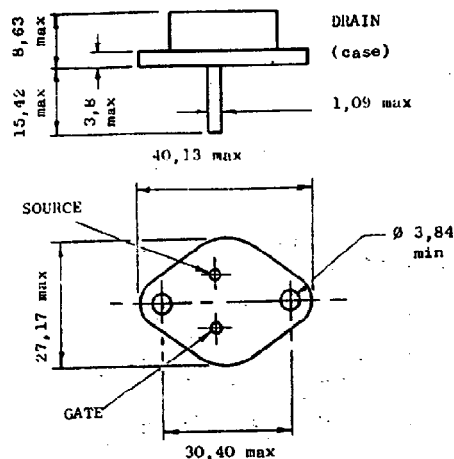


Specification available from:
AS SHOWN IN PD 9002, CECC 00200
AND
INTERNATIONAL RECTIFIER CO (GB) LTD
HURST GREEN, OXTEY,
SURREY RH8 9BB.
TEL: 08833 - 3215 TELEX: 95219

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 127H with SB2 - 2 base

IEC 191-2 - CL4B with B18 base

TERMINAL CONNECTIONS - As outline above

MARKING - As per Type Numbers above

DETAIL SPECIFICATION FOR:

SINGLE GATE FIELD EFFECT TRANSISTORS
N CHANNEL - ENHANCED GATE

TYPE NUMBERS (SIMILAR TO)

IRF 130, 133 (2N6750, 2N6755)
IRF 230, 233 (2N6758, 2N6757)
IRF 330, 333 (2N6760, 2N6759)
IRF 430, 433 (2N6762, 2N6761)

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	-55	+150	$^\circ\text{C}$
4.2	Storage temperature	-55	+150	$^\circ\text{C}$
4.3	Drain - Source voltage at $V_{GS} = 0$	-	Table 1	V
4.4	Reverse gate-source voltage at $V_{DS} = 0$	-	- 20	V
4.5	Gate-drain voltage with source open circuit	-	+ 20	V
4.7	Continuous Drain current at temperature from -55 to + 90 $^\circ\text{C}$, then derate linearly to + 150 $^\circ\text{C}$	-	Table 1	A
4.7.1	Pulsed drain current	-	Table 1	A
4.8	Power dissipation (See Power V_S Temperature Curve Clause 9)	-	75	W

Table 1 LIMITING VALUES

TYPE IRF.....	130	133	230	233	330	333	430	433
V_{DSS} max (V)	100	60	200	150	400	350	500	450
I_D max (A)	17	12	8	8	5.5	4.5	4.5	4.0
I_{DM} max (A)	56	48	36	16	22	18	18	16

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) at 25°C Case	I_{DN} Pulsed Drain Current (Amps)	P_{tot} Max. Power Dissipation (Watts)	g_{fs} Minimum Transconductance (Siemens)	C_{iss} Typical Input Capacitance (pf)
IRF130	100	0,18	14,0	56,0	75	3,0	600
IRF133	60	0,25	12,0	48,0			
IRF230	200	0,4	9,0	36,0	75	2,5	600
IRF233	150	0,6	8,0	16,0			
IRF330	400	1,0	5,5	22,0	75	2,0	700
IRF333	350	1,5	4,5	18,0			
IRF430	500	1,5	4,5	18,0	75	1,5	600
IRF433	450	2,0	4,0	16,0			

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		Symbol	Value		Unit
				min	max	
SECT 1						
5.1	+	Leakage current with drain. short circuit to source at $V_{GSR} = 20V$	$I_{GSS(1)}$	-	100	nA
5.2	+	Leakage current with drain short circuited to source at $V_{GSR} = 15V$ $T_{case} = 125^{\circ}C$	$I_{GSS(2)}$	-	200	nA
5.5	+	Gate-source threshold voltage at $V_{DS} = 20$ $I_D = 250\mu A$	$V_{GS(TO)}$	2,0	4,0	V
5.6	+	On state drain current at $V_{GS} = 7V$ $V_{DS} = 10V$	I_D	See Table II		A
5.7	+	Input capacitance See below. Sect 3 Clause 5.9	C_{ISS}	See Table III		pF
5.9	+	Short circuit forward transconductance at $V_{DS} =$ See Table IV $I_D =$ Using circuit shown in Appendix I or Automatic Test Equipment e.g. IMPACT II System	g_{21s}	See Table IV		S

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		Units
				min	max	
SECT 3						
5.7	+	For all devices $V_{\text{DSS}} = \text{See Table I}$ $V_{\text{GS}} = 0\text{V}$	I_{DSX}	-	250	μA
5.8	+	NOTE: Re High Voltage Types Drain-source on-state voltage at $I_{\text{D}} = \text{See Table VI}$ $V_{\text{GS}} = 10\text{V}$	$V_{\text{DS(on)}}$	-	See Table VI	
5.9	+	Small signal, common source, capacitance at $V_{\text{DS}} = 25\text{V}$ $V_{\text{GS}} = 0\text{V}$ Input Capacitance Output Capacitance Reverse Transfer Capacitance	C_{11ss} C_{22ss} C_{12ss}		See Table III	
5.10	+	Switching times at $V_{\text{GS(ON)}} = 10\text{V}$ $I_{\text{D}} = \text{See Table V}$ Using the circuit shown in Appendix II Turn on delay time Rise time Fall time Turn off delay time	$t_{\text{d(on)}}$ t_{r} t_{f} $t_{\text{d(off)}}$		See Table V	

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	
<u>SECT</u> <u>1 & 3</u>		Thermal resistance, junction to case (all types)	$R_{th(j-case)}$	-	1,67	K/W
<u>SECT 4</u> <u>5.6</u>	+	Drain - source on-state resistance at $I_D = \text{See Table VI}$ $V_{GS} = 10V$	$r_{DS(on)}$	See Table VI		Ω

TABLE II - ON STATE DRAIN CURRENT

TYPE IRF..		130	133	230	233	330	333	430	433
I _D (A)	min	6	6	5	5	4,0	4,0	3,0	3,0
	* max	50	50	48,6	48,6	36,8	36,8	25,0	25,0

All at $V_{GS} = 7V$ $V_{DS} = 10V$

TABLE III - MAXIMUM CAPACITANCES

TYPE IRF..	130	133	230	233	330	333	430	433
C _{11ss} (pF)	1000		900		1000		900	
C _{22ss} (pF)	500		450		300		200	
C _{12ss} (pF)	100		150		20		60	

All at $V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1MHz$

TABLE IV - SHORT CIRCUIT FORWARD TRANSDUCTANCE

TYPE IRF..	130	133	230	233	330	333	430	433
g _{21s} (S)	min	3	2,5		2,0		1,5	
	max	12,5	12,15		9,2		6,25	
I _D (A)	6		2,5		2		1,5	

All at $V_{DS} = 10V$

Using the circuit shown in Appendix I and pulsed consitions of
 $t_p = 300 \mu s$ and a duty cycle = 3%. Or A. TIE such as an IMPACT II System