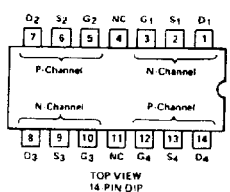


BRITISH STANDARDS INSTITUTION 2, PARK STREET, LONDON W1A 2BS	BS CECC 50 012-041 ISSUE 1 JUNE 1987 Page 1 of 14 pages
Specification available from: as shown in PD 9002, CECC 00200 and: SILICONIX LTD. MORRISTON SWANSEA SA6 6NE. Telephone (0792) 310100. Telex 48197	 DETAIL SPECIFICATION FOR MANUFACTURER'S PART NUMBER VQ3001P For ordering information see clause 7 of this document
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BS CECC 50000: 1982. 1. MECHANICAL DESCRIPTION (all dimensions in millimetres)  For detail dimensions see BS3934 SO-188B (IEC 191-2 code 050G06) For marking information see clause 6.	2. QUAD MOSPOWER ARRAY Semiconductor material: Silicon Polarity: 2 n-channel, 2 p-channel Device type: Quad Insulated Gate Enhancement FET Encapsulation: Hermetically sealed Dual-in-Line Application: High Speed Switching Power: Case Rated 3. LEVEL OF QUALITY ASSESSMENT LEVEL E WARNING: THESE DEVICES ARE STATIC SENSITIVE 

4. LIMITING VALUES (absolute maximum rating system)

CECC 50012 Section 3 Reference	These apply over the temperature range unless otherwise stated.	VALUE			
		SYMBOL	MIN.	MAX.	UNIT
4.1	Operating temperature range	T_{case}	-55	125	$^{\circ}C$
4.2	Storage temperature range	T_{stg}	-55	150	$^{\circ}C$
4.3	Drain-source voltage:	$-V_{DSX}$	-	30	V
	p-channel	V_{DSX}	-	30	V
4.4	Gate-source forward voltage:	V_{GSF}	-	40	V
	p-channel	$-V_{GSF}$	-	40	V
	n-channel	$-V_{GSR}$	-	40	V
	Gate-source reverse voltage:	V_{GSR}	-	40	V
	p-channel	$-V_{GDO}$	-	30	V
	n-channel	V_{GDO}	-	30	V
4.5	Gate-drain reverse voltage:	I_D	-	0.6	A
4.7	Drain current - continuous at $T_C=100^{\circ}C$	$-I_D$	-	0.6	A
4.8.1	Power dissipation ($T_C = 25^{\circ}C$) Derating factor (j-c) as in clause 5.11	P_{tot}	single	3.3	W
			quad	5.0	W

See the relevant Qualified Parts List for availability of components made to this specification

4. **LIMITING CONDITIONS OF USE** (Continued)

For thermal coupling and effective thermal resistance see Appendix III.

5. **CHARACTERISTICS** $T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated

CECC 50012 Section 3 Reference	PARAMETERS AND TEST CONDITIONS	VALUE			
		SYMBOL	MIN	MAX	UNIT
5.1	Gate-source leakage current. $V_{\text{DS}} = 0\text{V}$, $V_{\text{GS}} = -16\text{V}$ p-channel	$-I_{\text{GSS}}(1)$	-	100	nA
	$V_{\text{GS}} = 16\text{V}$ n-channel	$I_{\text{GSS}}(1)$	-	100	nA
5.2	Gate-source leakage current $T_{\text{C}} = 125^{\circ}\text{C}$ $V_{\text{DS}} = 0\text{V}$, $V_{\text{GS}} = -16\text{V}$ p-channel	$-I_{\text{GSS}}(2)$	-	500	nA
	$V_{\text{GS}} = 16\text{V}$ n-channel	$I_{\text{GSS}}(2)$	-	500	nA
5.5	Gate threshold voltage $I_{\text{D}} = 1\text{mA}$, $V_{\text{DS}} = -2\text{V}$ p-channel	$-V_{\text{GS}}(\text{TO})$	2.0	-	V
	$V_{\text{DS}} = -4.5\text{V}$		-	4.5	V
	$V_{\text{DS}} = 0.8\text{V}$ n-channel	$V_{\text{GS}}(\text{TO})$	0.8	-	V
	$V_{\text{DS}} = 2.5\text{V}$		-	2.5	V
5.6	Drain current pulsed 80 to 300 μs , 1% duty cycle $V_{\text{GS}} = -12\text{V}$, $V_{\text{DS}} = -15\text{V}$ p-channel	$-I_{\text{D}}$	1.5	5.0	A
	$V_{\text{GS}} = 12\text{V}$, $V_{\text{DS}} = 15\text{V}$ n-channel	I_{D}	2.0	8.0	A
5.7	Drain cut-off current $V_{\text{GS}} = 0\text{V}$, $V_{\text{DS}} = -24\text{V}$ p-channel	$-I_{\text{DSX}}$	-	10	μA
	$V_{\text{DS}} = 24\text{V}$ n-channel	I_{DSX}	-	10	μA
5.8	Drain-source on-state voltage pulsed 80 to 300 μs , 1% duty cycle $I_{\text{D}} = -1\text{A}$, $V_{\text{GS}} = -12\text{V}$ p-channel	$-V_{\text{DS}}(\text{ON})$	-	2.0	V
	$I_{\text{D}} = 1\text{A}$, $V_{\text{GS}} = 12\text{V}$ n-channel	$V_{\text{DS}}(\text{ON})$	-	1.0	V

5. **CHARACTERISTICS** (Continued)

 $T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated

CECC 50012 Section 3 Reference	PARAMETERS AND TEST CONDITIONS	VALUE			
		SYMBOL	MIN	MAX	UNIT
5.9.1	Input capacitance $f = 1 \text{ MHz}$ $V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = -15\text{V}$ p-channel	$C_{11\text{ss}}$	-	150	pF
	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 15\text{V}$ n-channel		-	110	pF
5.9.2	Output capacitance $f = 1 \text{ MHz}$ $V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = -15\text{V}$ p-channel	$C_{22\text{ss}}$	-	100	pF
	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 15\text{V}$ n-channel		-	110	pF
5.9.3	Reverse transfer capacitance $f = 1 \text{ MHz}$ $V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = -15\text{V}$ p-channel	$C_{12\text{ss}}$	-	60	pF
	$V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 15\text{V}$ n-channel		-	35	pF
5.10	For test conditions see Appendix II				
5.10.1	Turn-on delay time p-channel	$t_{\text{d(on)}}$	-	30	ns
	n-channel		-	30	ns
5.10.2	Rise time p-channel	t_{r}	-	10	ns
	n-channel		-	10	ns
5.10.3	Turn-off delay time p-channel	$t_{\text{d(off)}}$	-	30	ns
	n-channel		-	30	ns
5.10.4	Fall time p-channel	t_{f}	-	10	ns
	n-channel		-	10	ns
5.11	Thermal resistance, junction to case (single device)	$R_{(\text{th})\text{jc}}$	-	38	$^{\circ}\text{C/W}$

6. MARKING

Each device shall bear the following marking:

- (a) The manufacturer's type number (see table 1)
- (b) The factory identification code
- (c) The date code
- (d) The Mark of Conformity, unless a C of C is used.

Each package containing one or more of these transistors shall bear all of the above markings except (b) and in addition:

- (c) the detail specification number (see table 1).

Interpretation of marking information: XXXXXXXX E - Y

Device type number _____
Assessment level _____
Screening sequence: Y = blank: no screening _____

A: sequence A

B: sequence B

C: sequence C

D: sequence D

7. ORDERING INFORMATION

The following minimum information is necessary to order a specific device, unless otherwise specified:

- Precise type number.
- CECC reference of detail specification with issue number and/or date when relevant.
- Level of quality assessment as defined in appendix 11A and, if required, screening sequence as defined in appendix VI of CECC 50000, reproduced as appendix 1 of this detail specification.
- Any other particulars.

TABLE 1

ORDER TYPE	SPECIFICATION NUMBER	MARKING
BS VQ3001PE-Y	BS CECC 50 012-041 Issue 1 date June 1987	VQ3001PE-Y

8. RELATED DOCUMENTS

- CECC 00 007 Basic specifications: Sampling plans and procedures for inspection by attributes.
- CECC 00 100 CECC Basic Rules.
- CECC 50 000 Harmonised system of Quality Assessment for electronic components:
Generic specification: Discrete semiconductor devices.
- CECC 50 012 Blank Detail Specification: Single gate field-effect transistors.
- IEC 68-2 Basic environmental testing procedures.
- IEC 191-2 Mechanical standardisation of semiconductor devices.

9. TEST CONDITIONS AND INSPECTION REQUIREMENTS

These are given in the following tables, where the values and exact test conditions are specified as required by the relevant text in CECC 50 000.

GROUP A

LOT BY LOT

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All tests are non-destructive (3.5.6 of CECC 50 000)
 Clause numbers refer to CECC 50 000 except where stated.

IL = inspection level
 AQL is given percent

EXAMINATION OR TEST AND REFERENCE	CONDITIONS $T_{case} = 25^{\circ}C$ unless otherwise stated	INSPECTION REQUIREMENTS				
		LIMITS			LEVELS	
		Min.	Max.	Unit	E	
					IL	AQL
<u>SUBGROUP A1</u> Visual Inspection	4.2.1				I	0.65
<u>SUBGROUP A2a</u> Non-operatives Gate-source leakage $-I_{GSS(1)}$ (4.3.4 T-071) $I_{GSS(1)}$ Gate threshold voltage $-V_{GS(TO)}$ (4.3.4 T-075) $V_{GS(TO)}$	$V_{DS} = 0V$ $V_{GS} = -16V$ p-channel $V_{GS} = 16V$ n-channel $I_D = -1mA$ $V_{DS} = -13.5V$ p-channel $V_{DS} = -0.2V$ $I_D = 1mA$ $V_{DS} = 7.5V$ n-channel $V_{DS} = 0.08V$	- - - 0.2 - 0.08	1.0 1.0 13.5 - 7.5 -	μA μA V V V V	II	0.15
<u>SUBGROUP A2b</u> Gate-source leakage $-I_{GSS(1)}$ (4.3.4 T-071) $I_{GSS(1)}$ Gate threshold voltage $-V_{GS(TO)}$ (4.3.4 T-075) $V_{GS(TO)}$ Drain current $-I_D$ (4.3.4 T-072) I_D Drain-source on-state voltage (4.3.4 T-085) $-V_{DS(ON)}$ $V_{DS(ON)}$	$V_{DS} = 0V$ $V_{GS} = -16V$ p-channel $V_{GS} = 16V$ n-channel $I_D = -1mA$ $V_{DS} = -4.5V$ p-channel $V_{DS} = -2.0V$ $I_D = 1mA$ $V_{DS} = 2.5V$ n-channel $V_{DS} = 0.8V$ $V_{DS} = -15V$ $V_{GS} = -12V$ p-channel $V_{DS} = 15V$ $V_{GS} = 12V$ n-channel $I_D = -1A$ $V_{GS} = -12V$ p-channel $I_D = 1A$ $V_{GS} = 12V$ n-channel	- - - 2.0 - 0.8 1.5 2.0 - -	100 100 4.5 - 2.5 - 5.0 8.0 2.0 1.0	nA nA V V V V A A V V	II	0.4