

CECC 50012-061
Issue 1

5: CHARACTERISTICS

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

+ - Indicates verified in inspection testing Clause 10.

CECC 50012 REFERENCE	PARAMETER AND TEST CONDITIONS	SYMBOL	MIN	MAX	UNITS
SECTION 1					
+ 5.1	Leakage current with drain short circuit to source @ $V_{GSR} = 20\text{V}$	$I_{GSS(1)}$	-	100	nA
+ 5.2	Leakage current with drain short circuit to source @ $V_{GSR} = 20\text{V}$, $T_{case} = 125^{\circ}\text{C}$	$I_{GSS(2)}$	-	1.0	μA
+ 5.5	Gate-source threshold voltage @ $V_{DS} = 20\text{V}$, $I_D = 250\mu\text{A}$	$V_{GS(TO)(1)}$	2.0	4.0	V
+ 5.5.1	Gate-source threshold voltage @ $T_{case} = 125^{\circ}\text{C}$, $V_{DS} = 20\text{V}$, $I_D = 250\mu\text{A}$	$V_{GS(TO)(2)}$	1.0	-	V
+ 5.5.2	Gate-source threshold voltage @ $T_{case} = -55^{\circ}\text{C}$, $V_{DS} = 20\text{V}$, $I_D = 250\mu\text{A}$	$V_{GS(TO)(3)}$	-	5.0	V
+ 5.6	On-state drain current @ $V_{GS} = 10\text{V}$, $V_{DS} = 10\text{V}$ IRFY130(M) IRFY430(M)	I_D	10.8 3.5	- -	A A
+ 5.7	Input capacitance, $f = 1\text{ MHz}$, $V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$ IRFY130(M) IRFY430(M)	C_{iss}	- -	1200 900	pF pF
+ 5.9	Short circuit forward transconductance @ $V_{DS} = 5\text{V}$ IRFY130(M) IRFY430(M) Pulse conditions $t_p < 300\mu\text{s}$, duty cycle $< 2\%$. See Appendix II for test circuit.	g_{21s}	4.0 2.5	- -	S S

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SECTION 3					
+ 5.7	Drain cut-off current @ $V_{GS} = 0\text{V}$ $V_{DS} = 100\text{V}$ IRFY130(M) $V_{DS} = 500\text{V}$ IRFY430(M)	$I_{DSX(1)}$	- -	250 250	μA μA
+ 5.7.1	Drain cut-off current @ $V_{GS} = 0\text{V}$, $T_C = 125^{\circ}\text{C}$ $V_{DS} = 100\text{V}$ IRFY130(M) $V_{DS} = 500\text{V}$ IRFY430(M)	$I_{DSX(2)}$	- -	1.0 1.0	mA mA
+ 5.8	Drain-source on-state voltage @ $V_{GS} = 10\text{V}$ $I_D = 8.0\text{A}$ IRFY130(M) $I_D = 2.5\text{A}$ IRFY430(M)	$V_{DS(on)}$	- -	1.52 4.00	V V
+ 5.9	Small signal common source, capacitance @ $f = 1\text{MHz}$, $V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$	C_{22ss}	-	500	pF
+ 5.9.2	Output capacitance IRFY130(M) IRFY430(M)				
+ 5.9.3	Reverse transfer capacitance IRFY130(M) IRFY430(M)	C_{12ss}	- -	150 80	pF pF
+ 5.10	Switching times @ $V_{GS(on)} = 10\text{V}$ Turn-on delay time $I_D = 8.0\text{A}$, $V_{DD} = 36\text{V}$ IRFY130(M) $I_D = 2.5\text{A}$, $V_{DD} = 225\text{V}$ IRFY430(M)	$t_{d(on)}$	- -	30 30	ns ns
	Rise time $I_D = 8.0\text{A}$, $V_{DD} = 36\text{V}$ IRFY130(M) $I_D = 2.5\text{A}$, $V_{DD} = 225\text{V}$ IRFY430(M)	t_r	- -	75 55	ns ns

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SECTION 3 + 5.10(cont)	Fall time $I_D = 8.0\text{A}, V_{DD} = 36\text{V}$ IRFY130(M) $I_D = 2.5\text{A}, V_{DD} = 225\text{V}$ IRFY430(M)	t_f	- -	45 55	ns ns
	Turn-off delay time $I_D = 8.0\text{A}, V_{DD} = 36\text{V}$ IRFY130(M) $I_D = 2.5\text{A}, V_{DD} = 225\text{V}$ IRFY430(M)	$t_{d(off)}$	- -	40 55	ns ns
	See Appendix II for test circuit				
SECTION 1 AND 3 + 5.11	Thermal resistance, junction to ambient Thermal resistance, junction to case	$R_{th(j-amb)}$ $R_{th(j-case)}$	- -	80 2.8	K/W K/W
	D.C. Isolation voltage, terminals to case (All terminals shorted)	V_{INS}	1000	-	V
	Single Pulse Avalanche Energy $V_{DD} = 25\text{V}, I_L = 10.8\text{A}, L = 0.53\text{mH}$ IRFY130(M) $V_{DD} = 50\text{V}, I_L = 3.5\text{A}, L = 25.0\text{mH}$ IRFY430(M)	E_{AS}	- -	41.2 170.1	mJ mJ

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6: MARKING

The following shall be marked on the device, in the following order of precedence, as space permits.
All the information shall appear on the primary pack used as initial protection or wrapping for delivery:-

1. The manufacturer's type number.
2. Date Code.
3. Factory identification code.
4. Level of quality assessment and screening level (if required).
Mark of conformity unless a certificate of conformity is used.

Each package containing one or more of these transistors shall contain all the above markings and in addition:-

5. This detail specification number (CECC 50012-061) followed by the letter defining the level of assessment and, if applicable the letter identifying the screening sequence.
6. A 'STATIC SENSITIVE' warning label.

7: ORDERING INFORMATION

The following minimum information is necessary to order a specific device.

1. Precise type number.
2. This detail specification number, issue number and date.
3. Level of quality assessment and screening level (if required).

Example:-

to CECC 50012-061 Issue 1 Level E/B

8: RELATED DOCUMENTS

- | | |
|------------|--|
| CECC 50000 | Generic Specification for discrete semiconductors. |
| CECC 00007 | Basic Specification. Sampling plans and procedures for inspection by attributes. |
| IEC 68-2 | Environmental testing of electronic components and electronic equipment. |
| IEC 191-2 | Mechanical standardization of semiconductor devices dimensions. |

9: RECOMMENDED HANDLING PRECAUTIONS: STATIC SENSITIVE DEVICES

To prevent damage by static discharge to these devices during handling, the procedures specified in BS 5783 'Handling procedures for static sensitive devices' should be followed.

10: TEST CONDITIONS AND INSPECTION REQUIREMENTS

These are given in the following tables, where the values and exact test conditions to be used should be specified as required for a given type in line with the indications given in CECC 50000 for the relevant test.

11: E_{AS} and V_{INS} TESTING

The testing of E_{AS} and V_{INS} shown in section 5 is part of 100% testing carried out in production.

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GROUP A Lot by Lot AQL given in % All tests are non-destructive (3.5.6 of CECC 50000) Clause numbers are made with respect to CECC 50000 unless otherwise stated Pulse tests: $t_p < 300\mu s$, duty cycle $< 2\%$ where indicated.							
EXAMINATION OR TEST	REF	CONDITIONS @T _{case} = 25°C UNLESS OTHERWISE STATED	INSPECTION REQUIREMENTS				
			LIMITS			LEVEL E	
			MIN	MAX	UNIT	IL	AQL
SUBGROUP A1 Visual inspection	4.2.1					I	0.65
SUBGROUP A2a Non-operative $I_{GSS(1)}$ $V_{GS(TO)(1)}$	4.3.4 T-071 4.3.4 T-075	Short or open circuit $V_{GSR} = 20V$ $V_{DS} = 20V$ $I_D = 250\mu A$	- 2.0	100 4.0	nA V	II	0.15
SUBGROUP A2b Leakage current $I_{GSS(1)}$ Drain cut off current $I_{DSX(1)}$ Gate source threshold voltage $V_{GS(TO)(1)}$ Drain current I_D	4.3.4 T-071 4.3.4 T-073 4.3.4 T-075 4.3.4 T-072	$V_{GSR} = 20V$ $V_{DS} = 0V$ $V_{GS} = 0V$ $V_{DS} = 100V$ IRFY130(M) $V_{DS} = 500V$ IRFY430(M) $V_{DS} = 20V$ $I_D = 250\mu A$ $V_{GS} = 7V$ $V_{DS} = 20V$ IRFY130(M) IRFY430(M)	- 2.0 - - 2.0 5.5 3.8	100 250 250 4.0 43.2 14.0	nA μA μA V A A	II	0.4