TABLE I. DEVICE PARAMETERS 1/

JPL PART # ST12125-	GENERIC PART #	MFR	MFR PART #	PKG TYPE	DETAIL SCREENING TESTS	ELECTRICAL CHARACTERISTICS & GROUP A TESTS	RADIATION (TID) LEVEL RAD(Si)
QF7110TR QF7130TR	IRHF7110 IRHF7130	INR	IRHF7110 IRHF7130	TO39 2/	TABLE III	TABLE IV	100K 3/

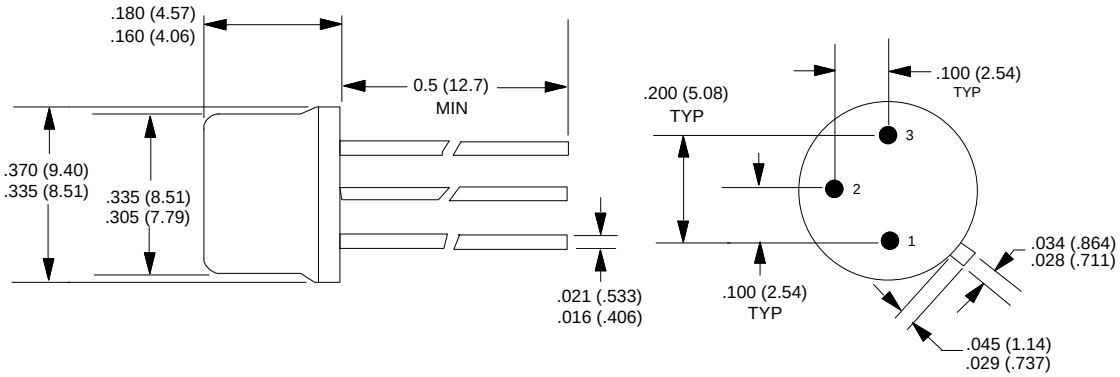
NOTES:

1/ THIS DRAWING, IN CONJUNCTION WITH CS515581, IMPOSES ALL REQUIREMENTS FOR PROCUREMENT OF THESE DEVICES.

2/ DEVICE PHYSICAL DIMENSIONS SHALL CONFORM TO FIGURE 1.

3/ STEADY STATE TOTAL DOSE IRRADIATION TESTS SHALL BE CONDUCTED PER MIL-S-19500, GROUP D, SUBGROUP 2 AND TABLE V HEREIN.

4. THIS STANDARD TAKES PRECEDENCE OVER DOCUMENTS REFERENCED HEREIN.



DIMENSIONS ARE IN INCHES (MILLIMETERS).

1. SOURCE
2. GATE
3. DRAIN

FIGURE 1. PHYSICAL CONFIGURATION

RELEASED THRU SECTION 356 DATA MANAGEMENT:		DATE:
REVISION: D	APPROVED BY (Section 514):	DATE:

APPROVED SOURCE(S)

VENDOR PART NO.	VENDOR	JPL PART NO.
SEE TABLE I	INTERNATIONAL RECTIFIER CORPORATION EL SEGUNDO, CA 90245 CAGE NO 59993	SEE TABLE I

The item listed in the approved source block and identified by vendor name, address, and part number will be evaluated and tested by the JPL Electronic Parts Reliability Section or its delegated alternate before being approved for use. Non-JPL users shall check with the Electronic Parts Reliability Section on the status of the part's approval before using.

JET PROPULSION LABORATORY CALIFORNIA INSTITUTE OF TECHNOLOGY — CAGE NO. 23835

Procurement Specification: CS515581 Screening Specification: ZPP-2∅73-GEN	TITLE: TRANSISTOR, POWER MOSFET, N CHANNEL, RAD HARD	DETAIL SPECIFICATION ST 12125
Custodian: Electronic Parts Reliability Section 514		SHEET 1 OF 4

FILE: (Sec.514): F:\USERS\514\SPECS\ST12125.D

TABLE II. MANUFACTURER'S MAXIMUM RATINGS (T_C=25°C)

PARAMETER	PART TYPE	RATING	UNITS
V_{DS}/V_{DG}	ALL	100	Vdc
V_{GS}	ALL	±20	Vdc
I_D	QF7110 QF7130	3.5 8.0	Adc
I_{DM}	QF7110 QF7130	14 32	A_{pk}
P_T $R_{th\ (1-C)}$	QF7110 QF7130 QF7110 QF7130	15 25 8.33 5.0	W °C/W
P_T (T_A=25°C) $R_{th\ (1-A)}$	ALL ALL	0.8 156	W °C/W
T_J, T_{STG}	ALL	-55 TO 150	°C

TABLE III. DETAIL SCREENING REQUIREMENTS

SCREEN (SEE MIL-S-19500, TABLE 11)	TEST CONDITIONS/ REQUIREMENTS
9. INTERIM ELECTRICAL PARAMETERS	I_{GSSF1}, I_{GSSR1}, I_{DSS1}, $V_{GS(TH)1}$ $R_{DS\ (ON)1}$, PER TEST CONDITIONS AND LIMITS OF TABLE IV.
10. HIGH TEMPERATURE GATE BIAS BURN-IN , HTGB	MIL-STD-750, METHOD 1042, CONDITION B (48 HOURS)
11. INTERIM ELECTRICAL AND DELTA PARAMETERS	I_{GSSF1}, I_{GSSR1}, I_{DSS1}, $V_{GS(TH)1}$ $R_{DS\ (ON)1}$, PER TEST CONDITIONS AND LIMITS OF TABLE IV. DELTA LIMITS: ΔI_{GSSF1} = ± 20nA OR ±100% OF INITIAL WHICHEVER IS GREATER ΔI_{GSSR1} = ± 20nA OR ±100% OF INITIAL WHICHEVER IS GREATER ΔI_{DSS1} = ± 10uA OR ±100% OF INITIAL WHICHEVER IS GREATER $\Delta V_{GS(TH)1}$ = ± 20% OF INITIAL VALUE $\Delta R_{DS(ON)1}$ = ± 20% OF INITIAL VALUE
12. HIGH TEMPERATURE REVERSE BIAS BURN-IN, HTRB	MIL-STD-750, METHOD 1042, CONDITION A (240 HOURS)
13. FINAL ELECTRICAL TESTS A. PARAMETERS B. DELTA LIMITS	 SUBGROUPS 2 AND 3 OF TABLE IV. SAME PARAMETERS AND LIMITS AS II ABOVE.

TABLE IV. GROUP A ELECTRICAL TESTS

TEST	MIL-STD-750 METHOD	TEST CONDITIONS	PART TYPE	LIMITS		
				MIN	MAX	UNITS
SUBGROUP 2 (T_C=25°C) DRAIN -SOURCE BREAKDOWN VOLTAGE, B_{VDSS}	3407	I_D= 1 mA, V_{GS}= 0	ALL	100		Vdc
GATE CURRENT, I_{GSSF1}	3411	V_{GS}= +20 V, V_{DS}= 0	ALL		100	nA
GATE CURRENT, I_{GSSR1}	3411	V_{GS}= -20 V, V_{DS}= 0	ALL		-100	nA
DRAIN CURRENT, I_{DSS1}	3413	V_{DS}= 80 Vdc, V_{GS}= 0	ALL		50	uA
GATE - SOURCE THRESHOLD VOLTAGE, $V_{GS(TH)1}$	3403	$V_{DS} \geq V_{GS}$, I_D= 1 mA	ALL	2	4	Vdc
DRAIN-SOURCE ON RESISTANCE, $R_{DS(ON)1}$	3421	V_{GS}= 12 Vdc 1/ I_D= 2.25 A I_D= 5.0 A	 QF7110 QF7130		 .60 .18	 Ω Ω
SUBGROUP 3 (T_C=125°C) GATE CURRENT, I_{GSSF2}	3411	V_{GS}= +20 Vdc, V_{DS}= 0	ALL		200	nA
GATE CURRENT, I_{GSSR2}	3411	V_{GS}= -20 Vdc, V_{GS}= 0	ALL		-200	nA
DRAIN CURRENT, I_{DSS2}	3413	V_{DS}= 80 Vdc, V_{GS}= 0	ALL		250	uA
GATE-SOURCE THRESHOLD VOLTAGE, $V_{GS(TH)2}$	3403	$V_{DS} \geq V_{GS}$ I_D= 1 mA	ALL	1		Vdc
DRAIN-SOURCE ON RESISTANCE, $R_{DS(ON)2}$	3421	V_{GS}= 12 Vdc 1/ I_D= 2.25 A I_D= 5.0 A	 QF7110 QF7130		 1.20 0.35	 Ω Ω
LOW TEMP OPERATION GATE-SOURCE THRESHOLD VOLTAGE, $V_{GS(TH)3}$	3403	$V_{DS} \geq V_{GS}$, I_D= 1 mA T_C= -55°C	ALL		5	Vdc
SUBGROUPS 4 THROUGH 7 2/						

NOTES:

1/ PULSE TEST: PULSE WIDTH ≤300 usec; DUTY CYCLE ≤ 2%.
2/ THESE TESTS NOT APPLICABLE UNLESS SPECIFIED.

TABLE V. TID TESTS AND POST IRRADIATION PARAMETRIC LIMITS

TEST 1/ 2/	MIL-STD-750 METHOD	TEST CONDITIONS	PART TYPE	LIMITS		
				MIN	MAX	UNITS
SUBGROUP 2 (T_C=25°C) STEADY-STATE TOTAL DOSE IRRADIATION, (V_{GS} BIAS) 3/	1019	V_{GS}= 12 Vdc, V_{DS}= 0				
STEADY-STATE TOTAL DOSE IRRADIATION, (V_{DS} BIAS) 3/	1019	V_{DS}= 80 Vdc, V_{GS}= 0				
END POINT ELECTRICALS DRAIN-SOURCE BREAKDOWN VOLTAGE, BV_{DSS}	3407	I_D= 1 mA, V_{GS}= 0	ALL	100		Vdc
GATE CURRENT, I_{GSSF}	3411	V_{GS}= 20 Vdc, V_{DS}= 0	ALL		100	nA
GATE CURRENT, I_{GSSR}	3411	V_{GS}= -20 Vdc, V_{DS}= 0	ALL		-100	nA
DRAIN CURRENT, I_{DSS}	3413	V_{DS}= 80 Vdc, V_{GS}= 0	ALL		50	uA
GATE - SOURCE THRESHOLD VOLTAGE, $V_{GS(TH)}$	3403	$V_{DS} \geq V_{GS}$, I_D= 1 mA	ALL	2	4	Vdc
DRAIN-SOURCE ON RESISTANCE, $R_{DS(ON)}$	3421	V_{GS}= 12 Vdc 4/				
		I_D= 2.25 A	QF7110		.60	Ω
		I_D= 5.0 A	QF7130		.18	Ω

NOTES

1/ FOR SAMPLING PLAN, SEE MIL-S-19500.

2/ IRRADIATION TESTS MAY BE PERFORMED ANYTIME PRIOR TO LOT FORMATION. WAFERS MEETING THE TID REQUIREMENTS MAY BE USED FOR ANY OTHER DETAIL SPECIFICATION UTILIZING THE SAME DIE DESIGN.

3/ SEPERATE SAMPLES SHALL BE USED FOR EACH BIAS.

4/ PULSE TEST: PULSE WIDTH ≤ 300 uSEC; DUTY CYCLE ≤ 2%.

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