6 Lake Street, Lawrence, MA 01841
1-800-446-1158 / (978) 620-2600 / Fax: (978) 689-0803
Website: http: //www.microsemi.com

TECHNICAL DATA SHEET

RADIATION HARDENED P-CHANNEL MOSFET

Qualified per MIL-PRF-19500/615

DEVICES

2N7382

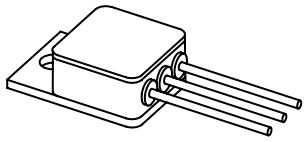
LEVELS

JANSM (3K RAD(Si))
JANSD (10K RAD(Si))
JANSR(100K RAD(Si))
JANSF(300K RAD(Si))

ABSOLUTE MAXIMUM RATINGS (T_C = +25°C unless otherwise noted)

Parameters / Test Conditions	Symbol	Value	Unit
Drain – Source Voltage	V_{DS}	-100	Vdc
Gate – Source Voltage	V_{GS}	± 20	Vdc
Continuous Drain Current T_C = +25°C	I_{D1}	-11.0	Adc
Continuous Drain Current T_C = +100°C	I_{D2}	-7.0	Adc
Max. Power Dissipation	P_{tl}	75 (1)	W
Drain to Source On State Resistance	$R_{ds(on)}$	0.3 (2)	Ω
Operating & Storage Temperature	T_{op}, T_{stg}	-55 to +150	°C

Note: (1) Derated Linearly by 0.6 W/°C for T_C > +25°C
(2) V_{GS} = -12Vdc, I_D = -7.0A



TO-257AA
JANSM2N7382, JANSD2N7382,
JANSR2N7382, JANSF2N7382
See Figure 1

PRE-IRRADIATION ELECTRICAL CHARACTERISTICS *(T_A = +25°C, unless otherwise noted)*

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Drain-Source Breakdown Voltage V_{GS} = 0V, I_D = -1mAdc	$V_{(BR)DSS}$	-100		Vdc
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$, I_D = -1.0mA $V_{DS} \geq V_{GS}$, I_D = -1.0mA, T_j = +125°C $V_{DS} \geq V_{GS}$, I_D = -1.0mA, T_j = -55°C	 $V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	 -2.0 -1.0	 -4.0 -5.0	Vdc
Gate Current V_{GS} = ±20V, V_{DS} = 0V V_{GS} = ±20V, V_{DS} = 0V, T_j = +125°C	 I_{GSS1} I_{GSS2}		 ±100 ±200	nAdc
Drain Current V_{GS} = 0V, V_{DS} = -80V V_{GS} = 0V, V_{DS} = -80V, T_j = +125°C	 I_{DSS1} I_{DSS2}		 -25 -0.25	 µAdc mAdc
Static Drain-Source On-State Resistance V_{GS} = -12V, I_D = -7.0A pulsed V_{GS} = -12V, I_D = -11.0A pulsed T_j = -125°C V_{GS} = -12V, I_D = -7.0A pulsed	 $r_{DS(on)1}$ $r_{DS(on)2}$ $r_{DS(on)3}$		 0.3 0.35 0.54	 Ω Ω Ω
Diode Forward Voltage V_{GS} = 0V, I_D = -11.0A pulsed	V_{SD}		-3.0	Vdc

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DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Gate Charge: On-State Gate Charge Gate to Source Charge Gate to Drain Charge	V_{GS} = -12V, I_D = -11.0A V_{DS} = -50V	 $Q_{g(on)}$ Q_{gs} Q_{gd}		 45 10 25	nC

SWITCHING CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Switching time tests: Turn-on delay time Rinse time Turn-off delay time Fall time	I_D = -11.0A, V_{GS} = -12Vdc, Gate drive impedance = 7.5Ω, V_{DD} = -50Vdc	 $t_{d(on)}$ t_r $t_{d(off)}$ t_f		 30 50 70 70	ns
Diode Reverse Recovery Time	di/dt ≤ -100A/µs, V_{DD} ≤ -50V, I_F = -11.0A	t_{rr}		250	ns

POST-IRRADIATION ELECTRICAL CHARACTERISTICS (3) *(T_A = +25°C, unless otherwise noted)*

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Drain-Source Breakdown Voltage V_{GS} = 0V, I_D = -1mAdc	$V_{(BR)DSS}$	-100		Vdc
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$, I_D = -1.0mA JANSR $V_{DS} \geq V_{GS}$, I_D = -1.0mA JANSF	 $V_{GS(th)1}$ $V_{GS(th)1}$	 -2.0 -2.0	 -4.0 -5.0	Vdc
Gate Current V_{GS} = ±20V, V_{DS} = 0V	I_{GSS1}		±100	nAdc
Drain Current V_{GS} = 0V, V_{DS} = -80V	I_{DSS1}		-25	µAdc
Static Drain-Source On-State Resistance V_{GS} = -12V, I_D = -7.0A pulsed	$r_{DS(on)}$		0.30	Ω
Diode Forward Voltage V_{GS} = 0V, I_D = -11.0A pulsed	V_{SD}		-3.0	Vdc

Note:

(3) Post-Irradiation Electrical Characteristics apply to devices subjected to Steady State Total Dose Irradiation testing in accordance with MIL-STD-750 Method 1019. Separate samples are tested for VGS bias (12V), and VDS bias (80V) conditions.

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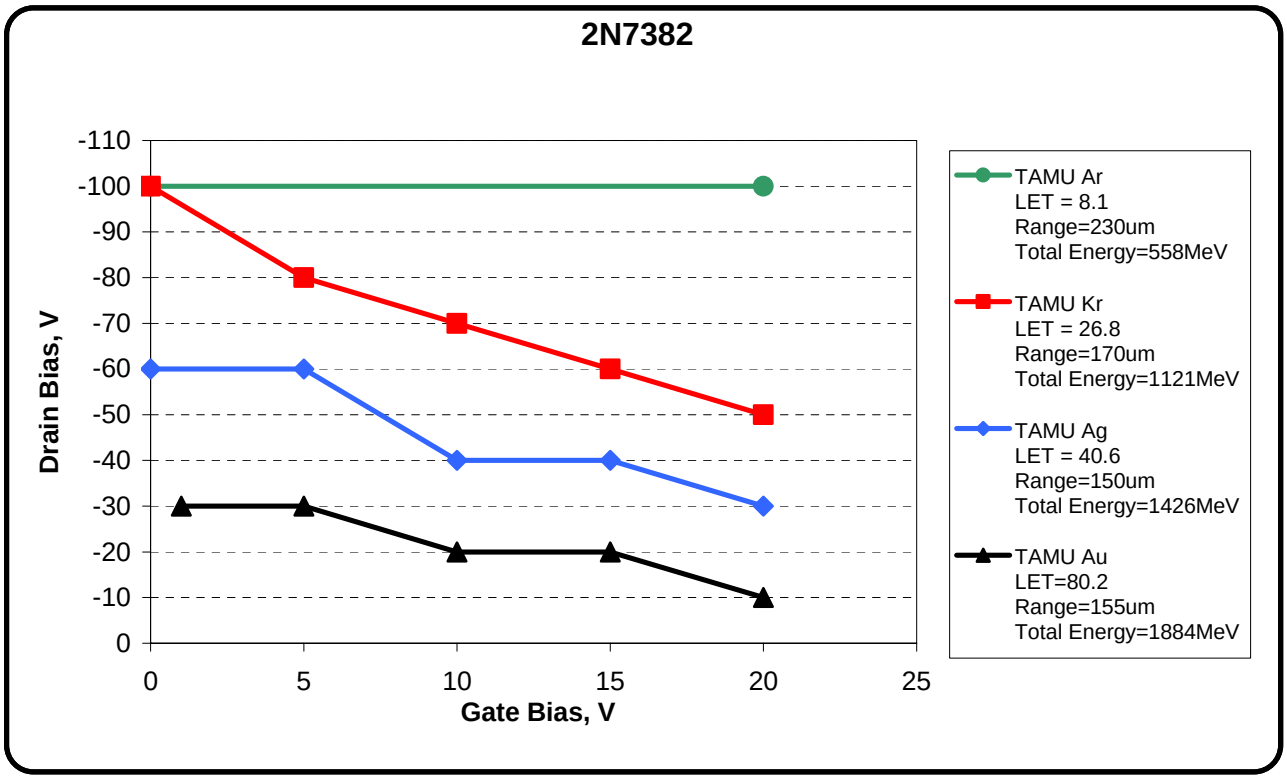
Single Event Effect (SEE) Characteristics:

Heavy Ion testing of the 2N7382 device was completed by similarity of die structure to the 2N7389. The 2N7389 has been characterized at the Texas A&M cyclotron. The following SOA curve has been established using the elements, LET, range, and Total Energy conditions as shown:



It should be noted that total energy levels are considered to be a factor in SEE characterization. Comparisons to other datasets should not be based on LET alone. Please consult factory for more information.

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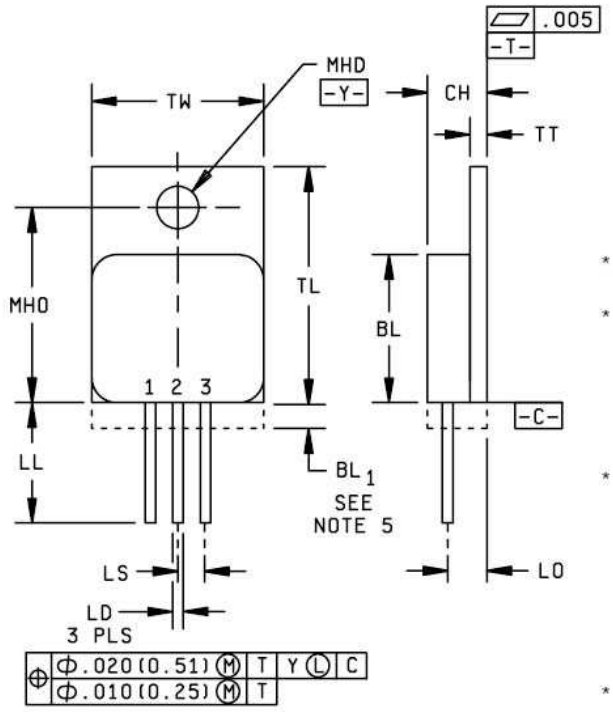
Figure 1: Case Outline and Pin Configuration for JANSM2N7382, JANSD2N7382, JANSR2N7382 & JANSF2N7382



	Ltr	Dimensions			
		Inches		Millimeters	
		Min	Max	Min	Max
*	BL	.410	.430	10.41	10.92
*	BL1		.028		0.71
	CH	.190	.200	4.83	5.08
	LD	.025	.035	0.64	0.89
*	LL	.500	.625	12.70	15.88
	LO	.120 BSC		3.05 BSC	
	LS	.100 BSC		2.54 BSC	
	MHD	.140	.150	3.56	3.81
*	MHO	.527	.537	13.39	13.64
	TL	.645	.665	16.38	16.89
	TT	.035	.045	0.89	1.14
	TW	.410	.420	10.41	10.67
	Term 1	Drain			
	Term 2	Source			
	Term 3	Gate			

NOTES:
1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. All terminals are isolated from case.
4. This area is for the lead feed-thru eyelets (configuration is optional, but will not extend beyond this zone.
5. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.