



# RADIATION TEST SUMMARY

PART TYPE : IRFY9140

DESCRIPTION : P-CHANNEL MOSFET

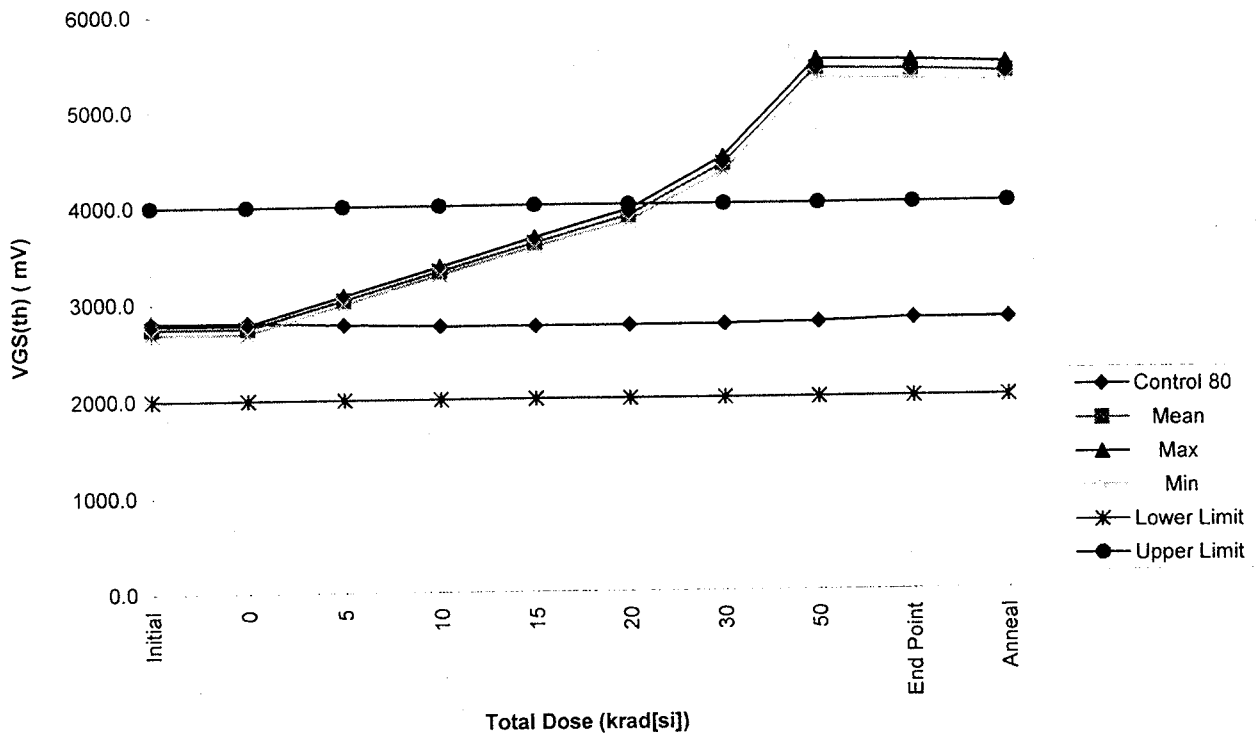
REPORT NO. : RD 206

PARAMETERS PLOTTED :  
VGS(th)

NOTE : The results for the remaining parameters showed no significant change and hence plots were not considered necessary.



### Radiation Results for VGS(th)



Dose (kRad)	Control 80 (mV)	Mean (mV)	Max (mV)	Min (mV)	Lower Limit (mV)	Upper Limit (mV)	Std.Dev.
Initial	2805.8	2743.8	2782.9	2689.4	2000	4000	42.58
0	2803.3	2745.3	2782.1	2691.7	2000	4000	41.05
5	2778.4	3029.0	3072.4	2983.6	2000	4000	41.42
10	2759.3	3317.0	3363.9	3280.3	2000	4000	42.15
15	2752.8	3603.5	3657.7	3562.1	2000	4000	43.01
20	2753.4	3883.1	3944.6	3826.3	2000	4000	49.56
30	2757.4	4415.7	4489.3	4340.2	2000	4000	60.88
50	2771.9	5400.1	5493.1	5298.3	2000	4000	82.87
End Point	2801.4	5380.5	5477.7	5277.1	2000	4000	86.26
Anneal	2797.9	5347.3	5444.3	5245.3	2000	4000	84.67

Lot size for statistics : 4 devices

RD 206 Date Code 9320B

Results file : RD206\_IRFY9140\_INIT\_EMS@\_IG6 from: 01.10.96 / 11:31:59  
Operator : PAUL RUSSELL  
Part number : IRFY9140  
Lot number : RD206  
Order number : D/C.9320B  
Vendor : IR  
: CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87.  
: INITIAL EMS @ IG6  
: IRFY9140 PO-PL-IG6-PL-0017 ISS.2 / V1.0 15/1/96 SMR

Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

	80	82	85	86	87
1.1 [mV]	2805.8	2771.9	2731.1	2782.9	2689.4
2.1 [nA]	1.8	1.9	1.9	1.9	1.9
3.1 [nA]	1.7	1.7	1.7	1.7	1.8
4.1 [uA]	0	0	0	0	0
5.1 [Ohm]	0.119	0.120	0.117	0.125	0.121
6.1 [ V]	123.2	119.5	123.5	129.2	123.5

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_INIT\_EMS@ERA / V1.0 15/1/96 SMR

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=====
Results file   : RD206_IRFY9140_INIT_EMS@ERA   from: 03.10.96 / 10:01:37
Operator      : PAUL RUSSELL
Part number   : IRFY9140
Lot number    : RD206
Order number  : D/C 9320B
Vendor        : IR
               : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87.
               : INITIAL EMS @ ERA
               : IRFY9140 PO-PL-IGG-PL-0017 ISS.2 / V1.0 15/1/96 SMR
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Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

	80	82	85	86	87
1.1 [mV]	2803.3	2772.2	2735.1	2782.1	2691.7
2.1 [nA]	1.6	1.6	1.6	1.6	1.7
3.1 [nA]	1.5	1.5	1.6	1.5	1.5
4.1 [uA]	0	0	0	0	0
5.1 [Ohm]	0.118	0.119	0.116	0.124	0.120
6.1 [V]	123.0	119.6	123.5	129.3	123.5

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_EMS\_@\_5\_KRAD / V1.0 15/1/96 SMR

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=====
Results file   : RD206_IRFY9140_EMS_@_5_KRAD   from: 03.10.96 / 10:02:30
Operator      : PAUL RUSSELL
Part number   : IRFY9140
Lot number    : RD206
Order number  : D/C 9320B
Vendor       : IR
              : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87
              : EMS @ 5 KRAD
              : IRFY9140 PO-PL-IGG-PL-0017 ISS.2 / V1.0 15/1/96
=====
  
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Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.0000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

	80	82	85	86	87
1.1 [mV]	2778.4	3054.4	3005.4	3072.4	2983.6
2.1 [nA]	2.0	1.9	2.0	1.9	1.9
3.1 [nA]	1.8	1.8	1.8	1.8	1.8
4.1 [uA]	0	0	0	0	0
5.1 [Ohm]	0.136	0.121	0.118	0.127	0.123
6.1 [V]	124.3	119.5	123.8	129.6	123.9



SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_EMS\_@\_10\_KRAD / V1.0 15/1/96 SMR

=====  
 Results file : RD206\_IRFY9140\_EMS\_@\_10\_KRAD from: 03.10.96 / 10:08:51  
 Operator : PAUL RUSSELL  
 Part number : IRFY9140  
 Lot number : RD206  
 Order number : D/C 9320B  
 Vendor : IR  
 : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87  
 : EMS @ 10 KRAD  
 : IRFY9140 PQ-PL-IGG-PL-0017 ISS.2 / V1.0 15/1/96 SMR  
 =====

Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

=====

	80	82	85	86	87
1.1 [mV]	2759.3	3341.2	3280.3	3363.9	3282.4
2.1 [nA]	2.1	2.0	2.1	2.0	2.0
3.1 [nA]	2.0	1.8	1.9	1.9	1.9
4.1 [uA]	0	0	0	1	1
5.1 [Ohm]	0.132	0.122	0.121	0.131	0.127
6.1 [V]	124.8	119.5	123.8	129.8	124.0

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_EMS\_@\_15\_KRAD / V1.0 15/1/96 SMR

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=====
Results file   : RD206_IRFY9140_EMS_@_15_KRAD   from: 03.10.96 / 10:39:30
Operator       : PAUL RUSSELL
Part number    : IRFY9140
Lot number     : RD206
Order number   : D/C 9320B
Vendor        : IR
               : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87
               : EMS @ 15 KRAD
               : IRFY9140 PO-PL-IGG-PL-0017 ISS.2 / V1.0 15/1/96 SMR
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Test steps

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1. -VGS           2000.0   ...   4000.0   mV
2. -IGSS (FWD)   (  0.0 )...   100.0   nA
3. -IGSS (REV)   (  0.0 )...   100.0   nA
4. -IDSS         (  0 )...   250     uA
5. RDS on        (  0.000 )...   0.210   Ohm
6. -V(BR)DSS     100.0   ...   700.0   V
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	80	82	85	86	87
1.1 [mV]	2752.8	3617.3	3562.1	3657.7	3576.9
2.1 [nA]	2.2	2.1	2.1	2.1	2.1
3.1 [nA]	2.0	1.9	1.9	2.0	1.9
4.1 [uA]	0	1	1	1	2
5.1 [Ohm]	0.133	0.123	0.121	0.132	0.128
6.1 [V]	125.2	119.3	123.8	129.8	123.9

=====  
Results file : RD206\_IRFY9140\_EMS\_@\_20\_KRAD from: 03.10.96 / 11:10:09  
Operator : PAUL RUSSELL  
Part number : IRFY9140  
Lot number : RD206  
Order number : D/C 9320B  
Vendor : IR  
: CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87  
: EMS @ 20 KRAD  
: IRFY9140 PO-PL-IGG-PL-0017 ISS.2 / V1.0 15/1/96 SMR  
=====

Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

=====

	80	82	85	86	87
1.1 [mV]	2753.4	3893.9	3826.3	3944.6	3867.5
2.1 [nA]	2.2	2.1	2.1	2.1	2.1
3.1 [nA]	2.1	2.0	1.9	2.0	2.0
4.1 [uA]	0	1	1	2	3
5.1 [Ohm]	0.134	0.125	0.124	0.134	0.130
6.1 [V]	125.3	119.4	123.7	129.6	124.0

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_EMS\_@\_30\_KRAD / V1.0 15/1/96 SMR

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=====
Results file   : RD206_IRFY9140_EMS_@_30_KRAD   from: 03.10.96 / 11:41:11
Operator       : PAUL RUSSELL
Part number    : IRFY9140
Lot number     : RD206
Order number   : D/C 9320B
Vendor         : IR
                : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87
                : EMS @ 30 KRAD
                : IRFY9140 P0-PL-IGG-PL-0017 ISS.2 / V1.0 15/1/96 SMR
=====
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Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

	80	82	85	86	87
1.1 [mV]	2757.4	4415.8	4340.2	4489.3	4417.6
2.1 [nA]	2.2	2.1	2.1	2.1	2.1
3.1 [nA]	2.0	1.9	2.0	1.9	1.9
4.1 [uA]	0	1	2	3	4
5.1 [Ohm]	0.132	0.127	0.127	0.137	0.133
6.1 [V]	125.0	119.2	123.5	129.6	123.7



SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_EMS @ 50\_KRAD / V1.0 15/1/96 SMR

=====  
 Results file : RD206\_IRFY9140\_EMS @ 50\_KRAD from: 03.10.96 / 13:20:26 -  
 Operator : PAUL RUSSELL  
 Part number : IRFY9140  
 Lot number : RD206  
 Order number : D/C 9320B  
 Vendor : IR  
 : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87  
 : EMS @ 50 KRAD  
 : IRFY9140 PO-PL-IG6-PL-0017 ISS.2 / V1.0 15/1/96 SMR  
 =====

Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

=====

	80	82	85	86	87
1.1 [mV]	2771.9	5376.6	5298.3	5493.1	5432.3
2.1 [nA]	1.9	1.7	1.8	1.8	1.7
3.1 [nA]	1.7	1.6	1.6	1.6	1.6
4.1 [uA]	0	3	4	6	6
5.1 [Ohm]	0.129	0.139	0.137	0.150	0.148
6.1 [V]	124.5	119.2	123.7	129.5	123.9

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA07F  
 RD206\_IRFY9140\_END\_POINT\_EMS / V1.0 15/1/96 SMR

=====  
 Results file : RD206\_IRFY9140\_END\_POINT\_EMS from: 04.10.96 / 09:22:30 -  
 Operator : PAUL RUSSELL  
 Part number : IRFY9140  
 Lot number : RD206  
 Order number : D/C 9320B  
 Vendor : IR  
 : CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87  
 : END POINT EMS  
 : IRFY9140 PO-PL-IG6-PL-0017 ISS.2 / V1.0 15/1/96 SMR  
 =====

Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

=====

	80	82	85	86	87
1.1 [mV]	2801.4	5350.6	5277.1	5477.7	5416.4
2.1 [nA]	1.6	1.6	1.7	1.7	1.6
3.1 [nA]	1.5	1.5	1.5	1.5	1.5
4.1 [uA]	0	2	1	2	2
5.1 [Ohm]	0.120	0.144	0.139	0.151	0.145
6.1 [V]	123.4	120.1	124.0	129.7	123.8

=====  
Results file : RD206\_IRFY9140\_POST\_ANNEAL\_EMS from: 11.10.96 / 10:06:14  
Operator : PAUL RUSSELL  
Part number : IRFY9140  
Lot number : RD206  
Order number : D/C 9320B  
Vendor : IR  
: CONTROL S/No 80 ; RAD SAMPLE S/NoS 82,85,86,87  
: POST ANNEAL EMS  
: IRFY9140 PO-PL-I66-PL-0017 ISS.2 / V1.0 15/1/96 SMR  
=====

Test steps

1. -VGS	2000.0	...	4000.0	mV
2. -IGSS (FWD)	( 0.0 )	...	100.0	nA
3. -IGSS (REV)	( 0.0 )	...	100.0	nA
4. -IDSS	( 0 )	...	250	uA
5. RDS on	( 0.000 )	...	0.210	Ohm
6. -V(BR)DSS	100.0	...	700.0	V

	80	82	20	85	86	87			
1.1 [mV]	2797.9	5320.8	F	5245.3	F	5444.3	F	5378.8	F
2.1 [nA]	1.5	1.5		1.5		1.5		1.5	
3.1 [nA]	1.4	1.4		1.5		1.4		1.4	
4.1 [uA]	0	2		1		2		2	
5.1 [Ohm]	0.121	0.143		0.138		0.150		0.145	
6.1 [ V]	123.7	120.0		124.1		129.5		123.8	