

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Phase-out/Discontinued

MOS FIELD EFFECT TRANSISTOR

2SK3324

SWITCHING N-CHANNEL POWER MOS FET

DESCRIPTION

The 2SK3324 is N-Channel MOS FET device that features a Low gate charge and excellent switching characteristics, and Designed for high voltage applications such as switching power supply, AC adapter.

FEATURES

- Low gate charge :
 $Q_G = 32 \text{ nC TYP. (} V_{DD} = 450 \text{ V, } V_{GS} = 10 \text{ V, } I_D = 6.0 \text{ A)}$
- Gate voltage rating : $\pm 30 \text{ V}$
- Low on-state resistance :
 $R_{DS(on)} = 2.8 \Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 3.0 \text{ A)}$
- Avalanche capability ratings

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

Drain to Source Voltage	V_{DSS}	900	V
Gate to Source Voltage	V_{GSS}	± 30	V
Drain Current (DC)	$I_{D(DC)}$	± 6	A
Drain Current (Pulse) ^{Note1}	$I_{D(pulse)}$	± 18	A
Total Power Dissipation ($T_C = 25^\circ\text{C}$)	P_{T1}	120	W
Total Power Dissipation ($T_A = 25^\circ\text{C}$)	P_{T2}	3.0	W
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current ^{Note2}	I_{AS}	6.0	A
Single Avalanche Energy ^{Note2}	E_{AS}	21.6	mJ

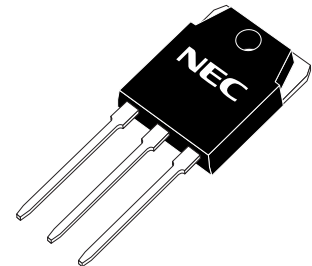
Notes 1. $PW \leq 10 \mu\text{s}$, Duty cycle $\leq 1\%$

2. Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = 150 \text{ V}$, $R_G = 25 \Omega$, $V_{GS} = 20 \text{ V} \rightarrow 0 \text{ V}$

ORDERING INFORMATION

PART NUMBER	PACKAGE
2SK3324	TO-3P

(TO-3P)

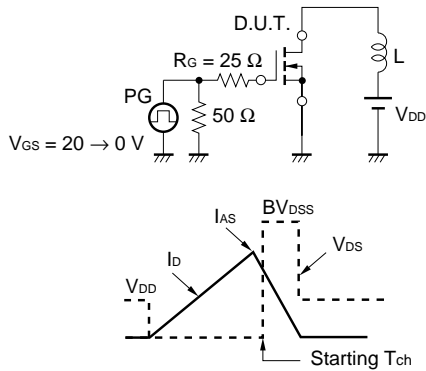


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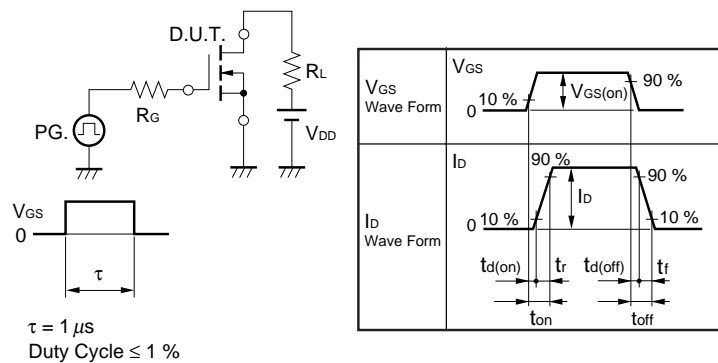
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Leakage Current	I _{DSS}	V _{DS} = 900 V, V _{GS} = 0 V			100	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±30 V, V _{DS} = 0 V			±100	nA
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1.0 mA	2.5		3.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 20 V, I _D = 3.0 A	2.5	3.3		S
Drain to Source On-state Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 3.0 A		2.5	2.8	Ω
Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz		1000		pF
Output Capacitance	C _{oss}			200		pF
Reverse Transfer Capacitance	C _{rss}			42		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 150 V, I _D = 3.0 A, V _{GS} = 10 V, R _G = 10 Ω, R _L = 10 Ω		17		ns
Rise Time	t _r			38		ns
Turn-off Delay Time	t _{d(off)}			57		ns
Fall Time	t _f			33		ns
Total Gate Charge	Q _G	V _{DD} = 450 V, V _{GS} = 10 V, I _D = 6.0 A		32		nC
Gate to Source Charge	Q _{GS}			5		nC
Gate to Drain Charge	Q _{GD}			20		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 6.0 A, V _{GS} = 0 V		0.9		V
Reverse Recovery Time	t _{rr}	I _F = 6.0 A, V _{GS} = 0 V, di/dt = 50 A/μs		1.9		μs
Reverse Recovery Charge	Q _{rr}			9.0		μC

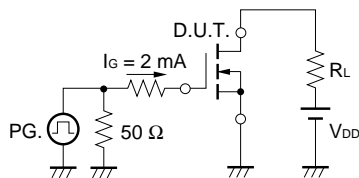
TEST CIRCUIT 1 AVALANCHE CAPABILITY



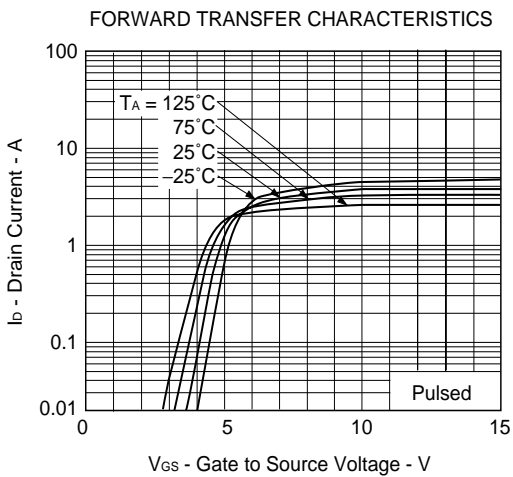
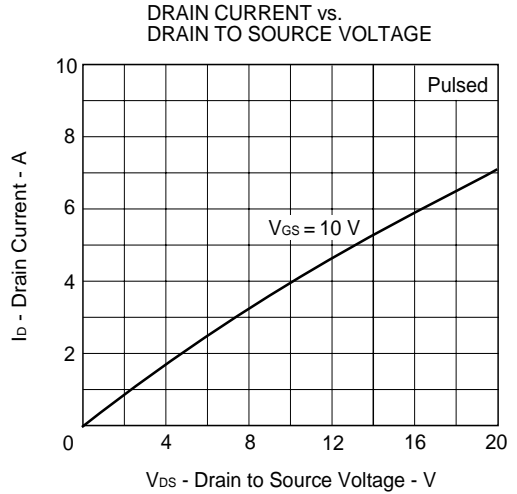
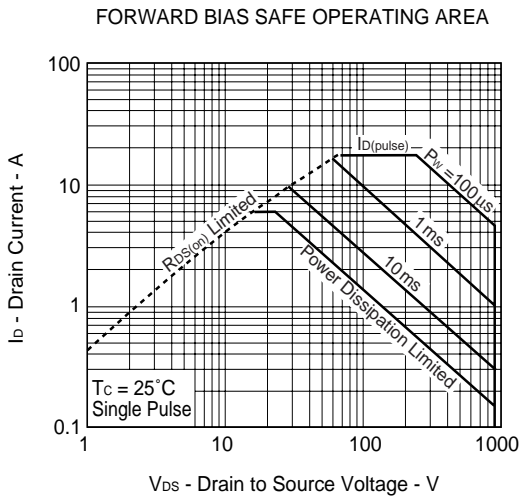
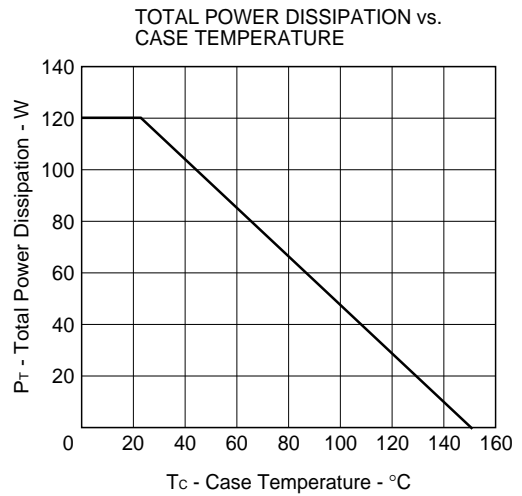
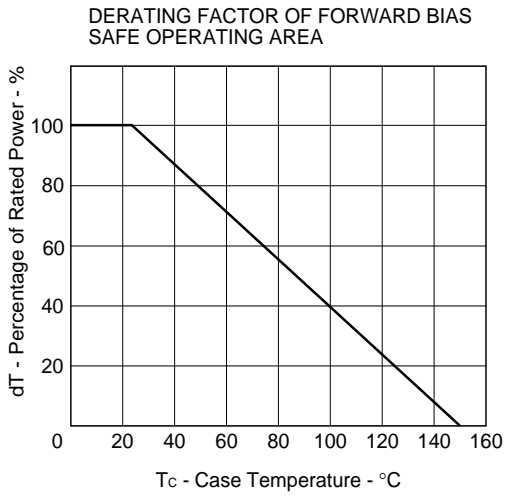
TEST CIRCUIT 2 SWITCHING TIME



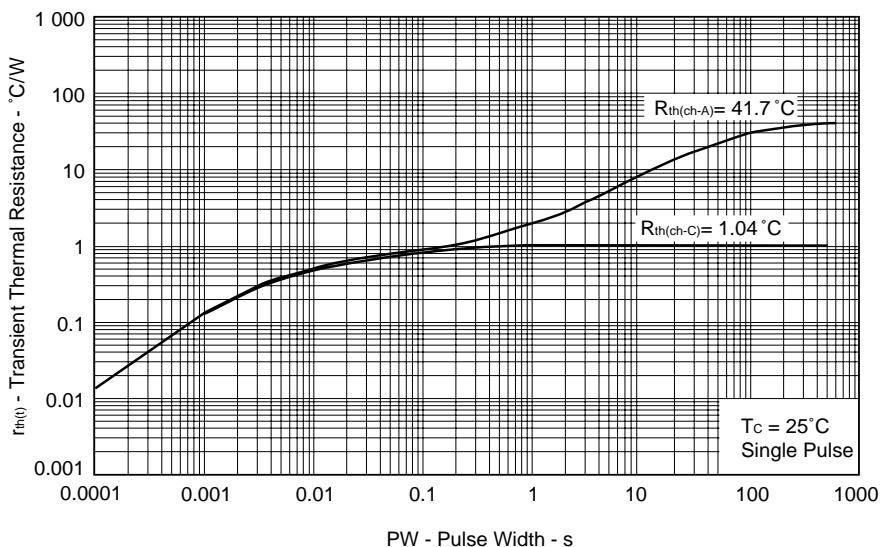
TEST CIRCUIT 3 GATE CHARGE



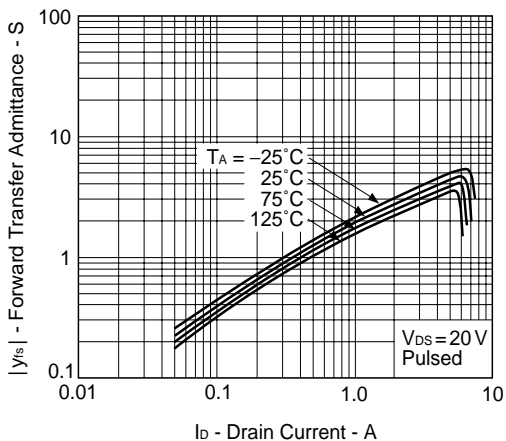
TYPICAL CHARACTERISTICS (T_A = 25 °C)



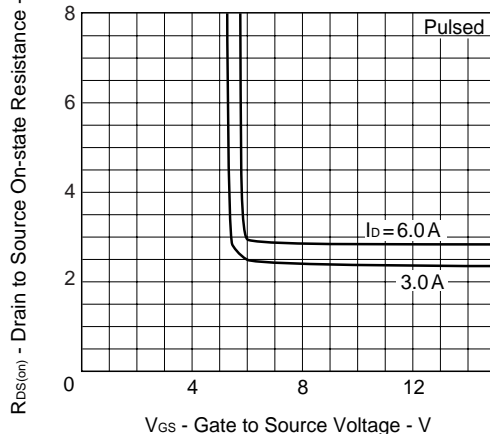
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



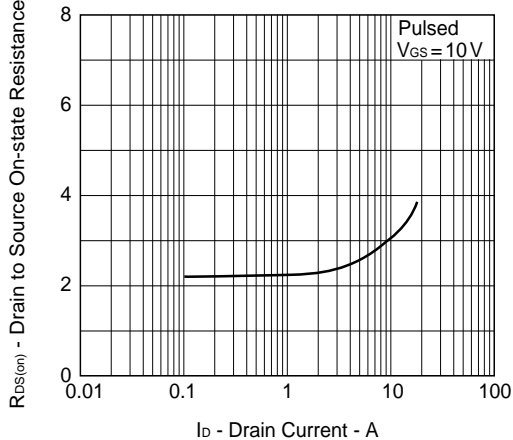
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



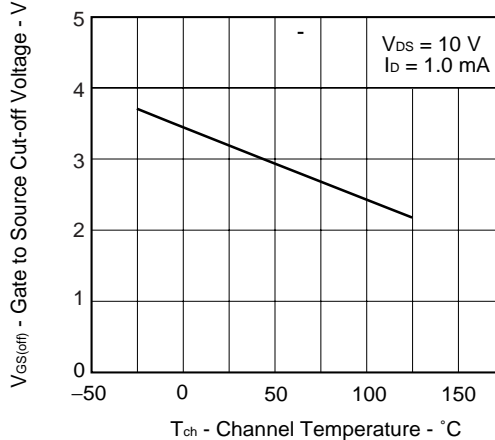
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



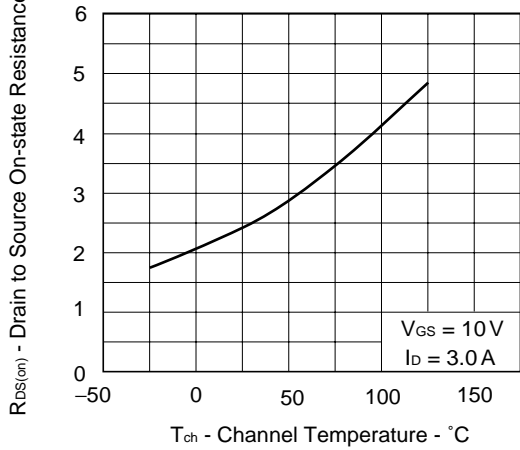
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



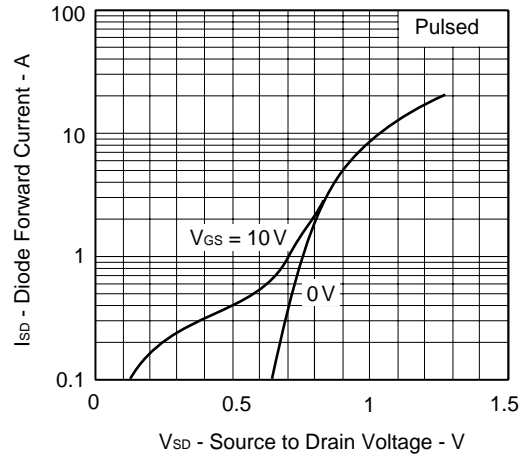
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



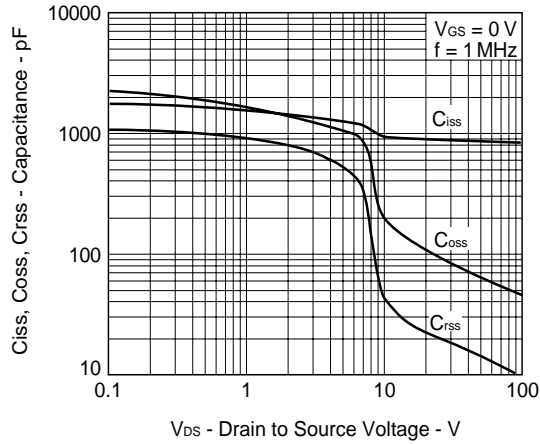
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



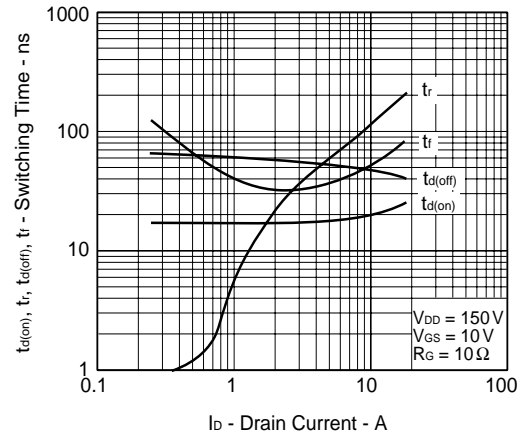
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



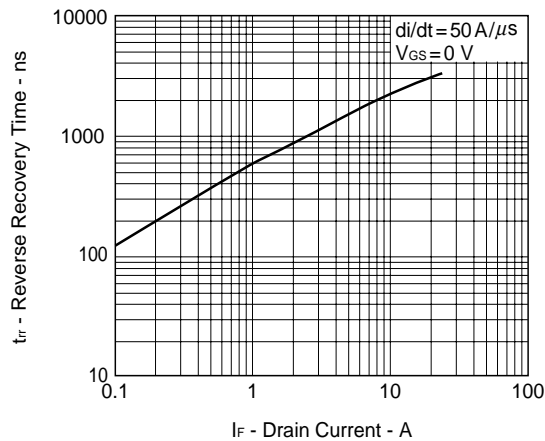
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



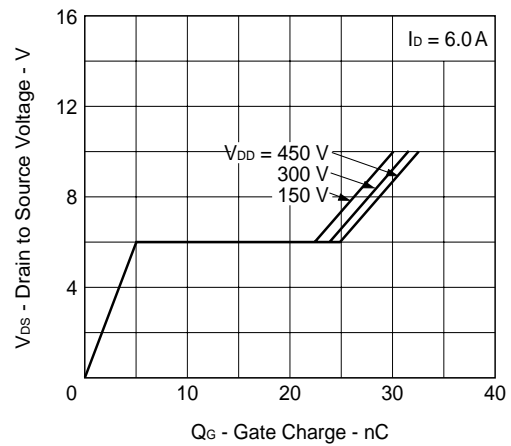
SWITCHING CHARACTERISTICS

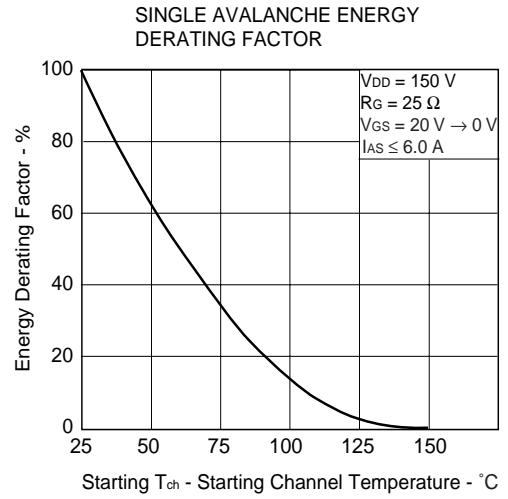
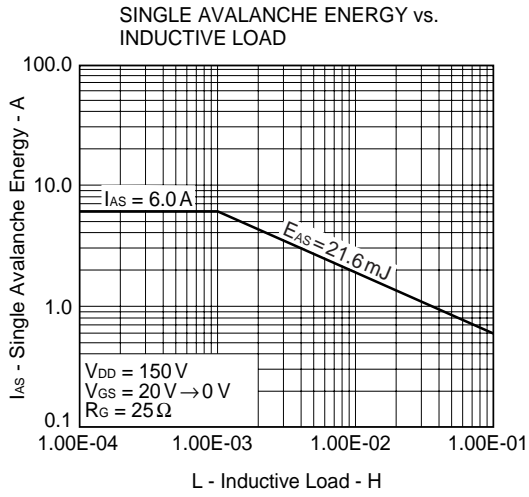


REVERSE RECOVERY TIME vs. DRAIN CURRENT



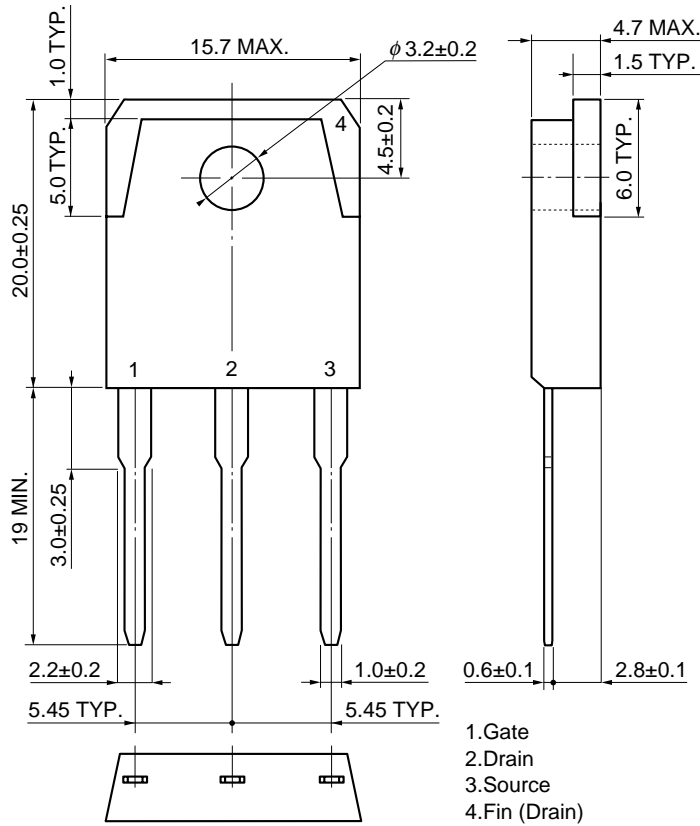
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



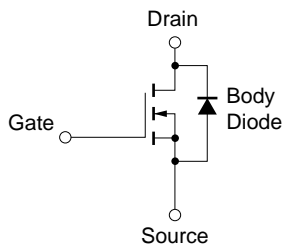


PACKAGE DRAWING (Unit : mm)

<R> TO-3P (MP-88)



EQUIVALENT CIRCUIT



Remark Strong electric field, when exposed to this device, cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it once, when it has occurred.

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