To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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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RENESAS

Notice

RENESAS

MOS FIELD EFFECT TRANSISTOR

Phase-out/Discontinued

2SK2487

SWITCHING
N-CHANNEL POWER MOS FET

DESCRIPTION

The 2SK2487 is N-Channel MOS Field Effect Transistors designed for high voltage switching applications.

FEATURES

- Low on-state resistance
  $R_{DS(on)}$ = 1.6 Ω MAX. (V_{GS} = 10 V, I_D = 4.0 A)
- Low input capacitance
  C_{iss} = 2 100 pF TYP.
- High Avalanche Capability Ratings

ABSOLUTE MAXIMUM RATINGS (T_A = 25 ˚C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	900	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	±30	V
Drain Current (DC)	$I_{D(DC)}$	±8.0	A
Drain Current (pulse)*	$I_{D(pulse)}$	±20	A
Total Power Dissipation (T_c = 25 ˚C)	P_{T1}	140	W
Total Power Dissipation (T_A = 25 ˚C)	P_{T2}	3.0	W
Channel Temperature	T_{ch}	150	˚C
Storage Temperature	T_{stg}	–55 to +150	˚C
Single Avalanche Current**	I_{AS}	8.0	A
Single Avalanche Energy**	E_{AS}	264	mJ

* PW ≤ 10 μs, Duty Cycle ≤ 1 %

** Starting T_{ch} = 25 ˚C, R_G = 25 Ω, V_{GS} = 20 V → 0

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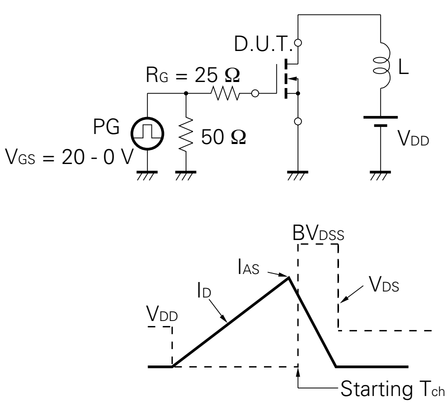
The mark <R> shows major revised points.
The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what." field.

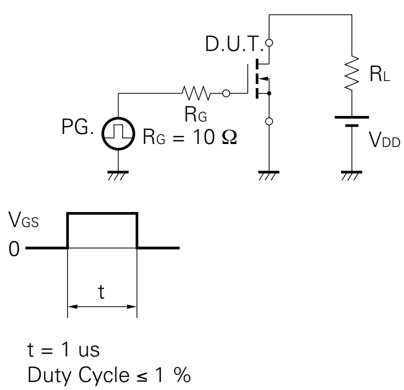
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

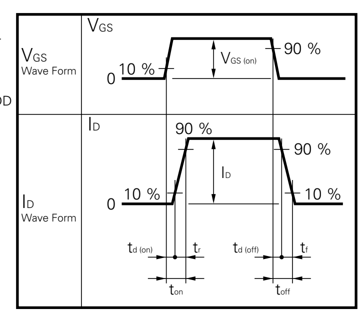
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-Resistance	$R_{DS(on)}$		1.1	1.6	Ω	V_{GS} = 10 V, I_D = 4.0 A
Gate to Source Cutoff Voltage	$V_{GS(off)}$	2.5		3.5	V	V_{DS} = 10 V, I_D = 1 mA
Forward Transfer Admittance	$\lvert y_{fs} \rvert$	3.0			S	V_{DS} = 20 V, I_D = 4.0 A
Drain Leakage Current	I_{DSS}			100	μA	V_{DS} = V_{DSS}, V_{GS} = 0
Gate to Source Leakage Current	I_{GSS}			±100	nA	V_{GS} = ±30 V, V_{DS} = 0
Input Capacitance	C_{iss}		2 100		pF	V_{DS} = 10 V
Output Capacitance	C_{oss}		310		pF	V_{GS} = 0
Reverse Transfer Capacitance	C_{rss}		60		pF	f = 1 MHz
Turn-On Delay Time	$t_{d(on)}$		30		ns	I_D = 4.0 A
Rise Time	t_r		20		ns	V_{GS} = 10 V
Turn-Off Delay Time	$t_{d(off)}$		130		ns	V_{DD} = 150 V
Fall Time	t_f		23		ns	R_G = 10 Ω
Total Gate Charge	Q_G		65		nC	I_D = 8.0 A
Gate to Source Charge	Q_{GS}		11		nC	V_{DD} = 450 V
Gate to Drain Charge	Q_{GD}		29		nC	V_{GS} = 10 V
Body Diode Forward Voltage	$V_{F(S-D)}$		1.0		V	I_F = 8.0 A, V_{GS} = 0
Reverse Recovery Time	t_{rr}		770		ns	I_F = 8.0 A, V_{GS} = 0
Reverse Recovery Charge	Q_{rr}		5.0		μC	di/dt = 50 A/μs

Test Circuit 1 Avalanche Capability

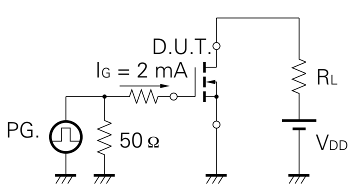


Test Circuit 2 Switching Time



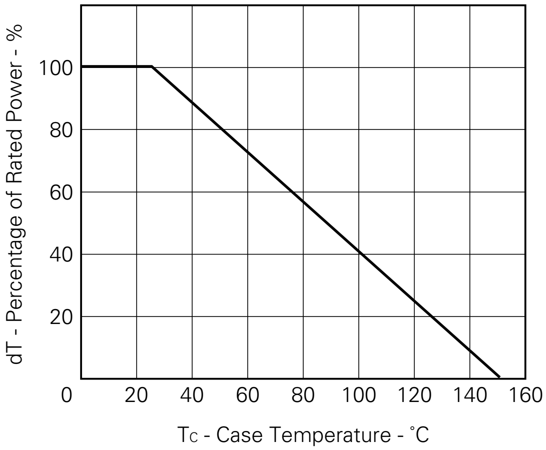


Test Circuit 3 Gate Charge

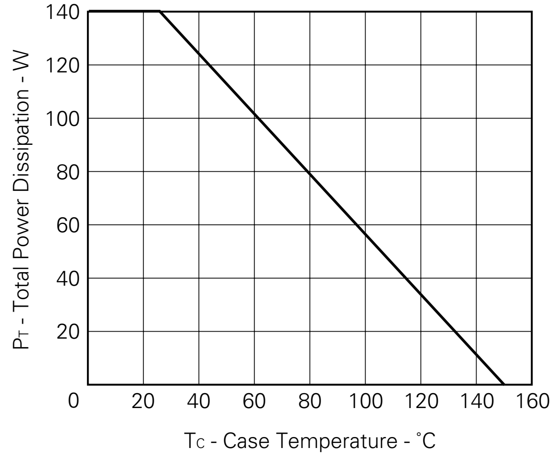


TYPICAL CHARACTERISTICS (T_A = 25 °C)

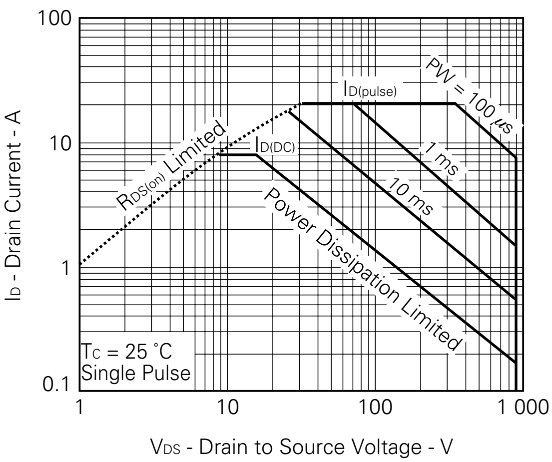
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



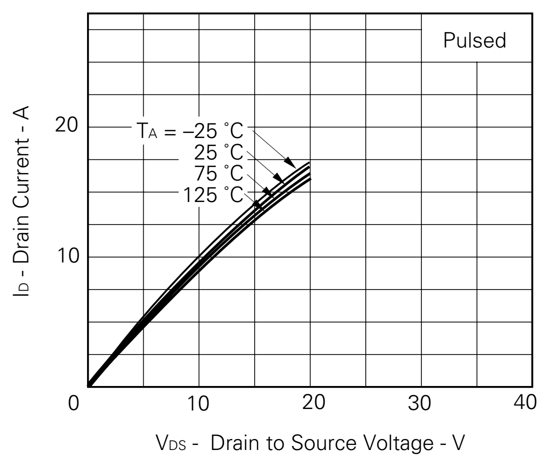
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



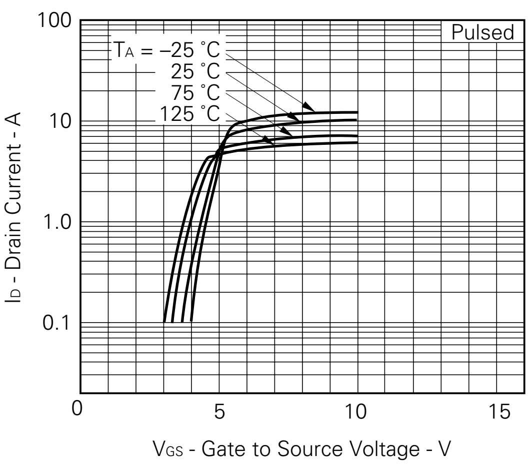
FORWARD BIAS SAFE OPERATING AREA



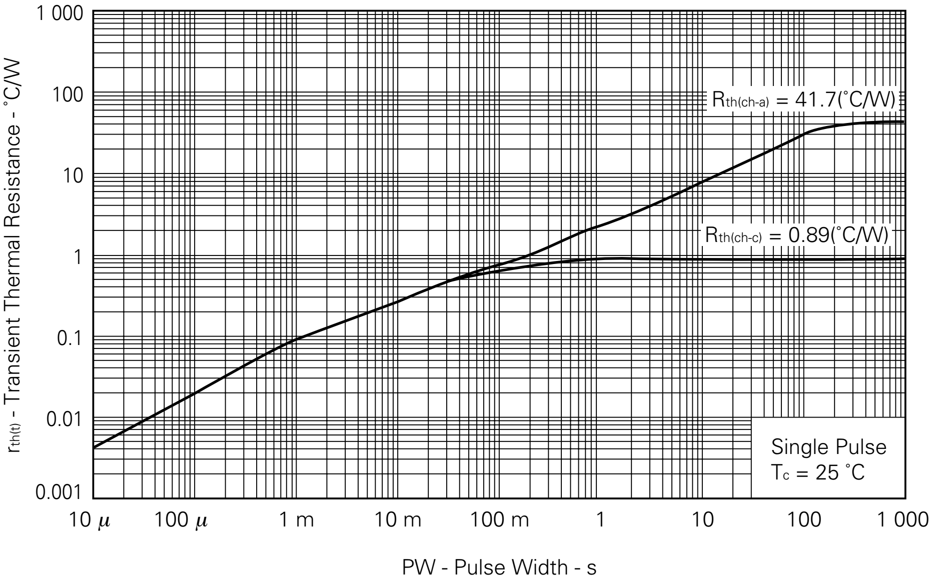
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



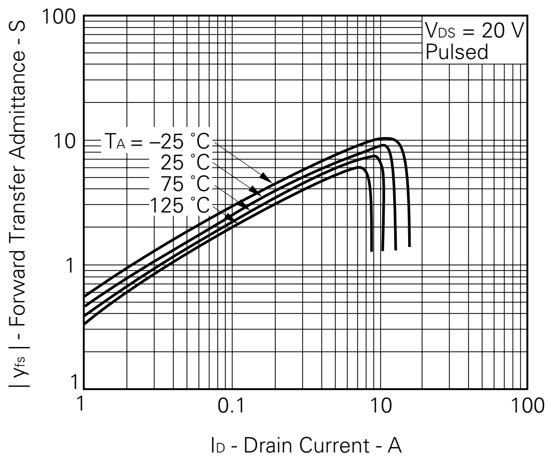
FORWARD TRANSFER CHARACTERISTICS



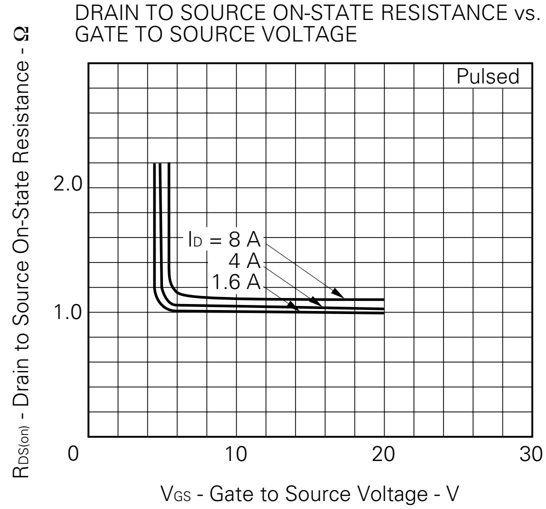
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



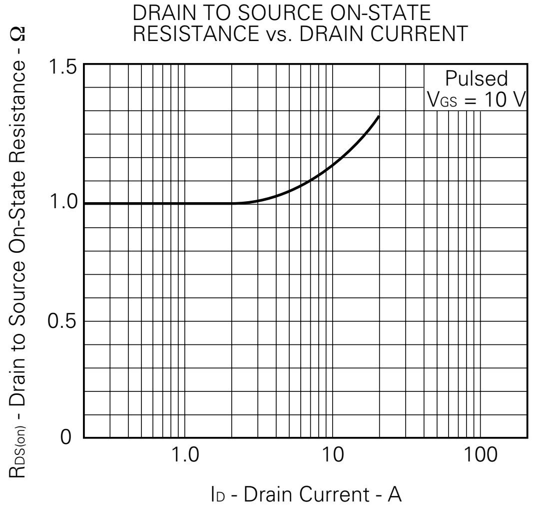
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



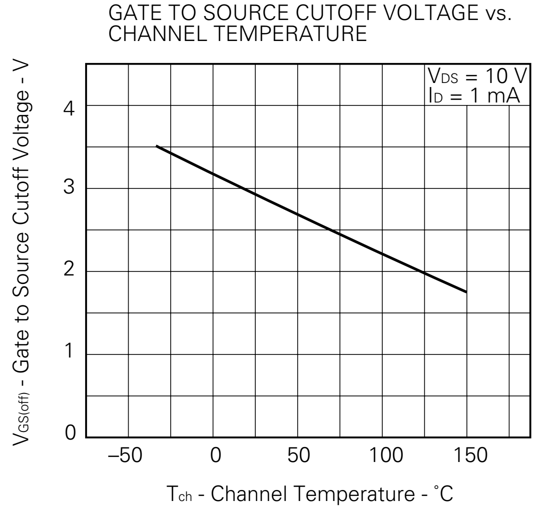
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



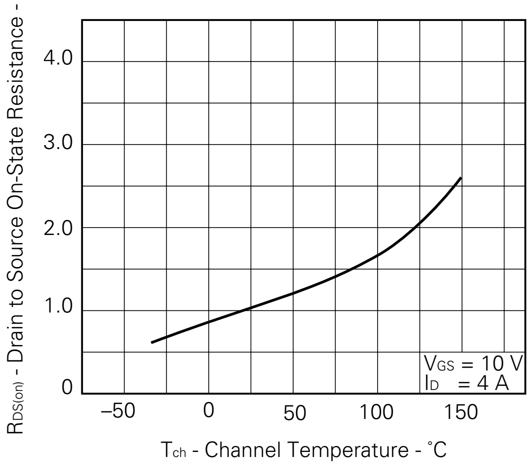
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



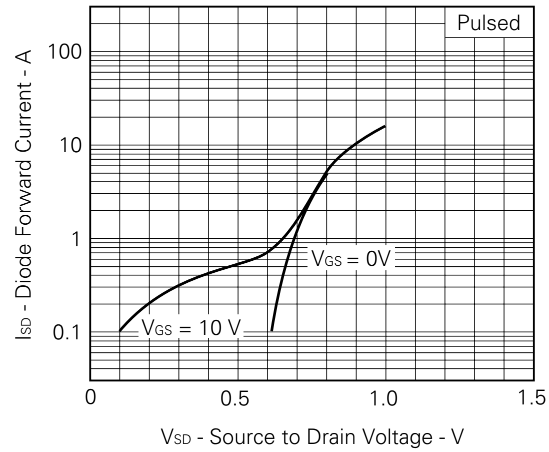
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



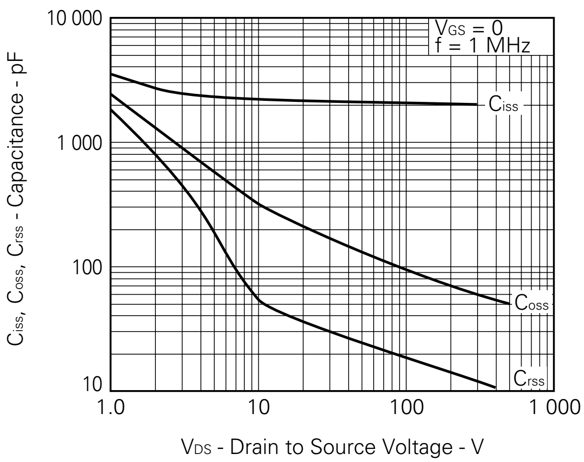
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
CHANNEL TEMPERATURE



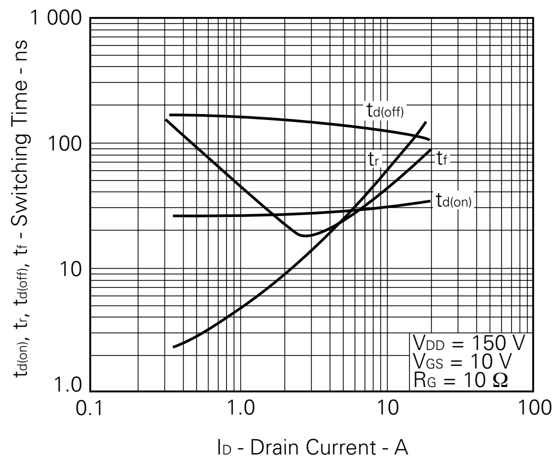
SOURCE TO DRAIN DIODE
FORWARD VOLTAGE



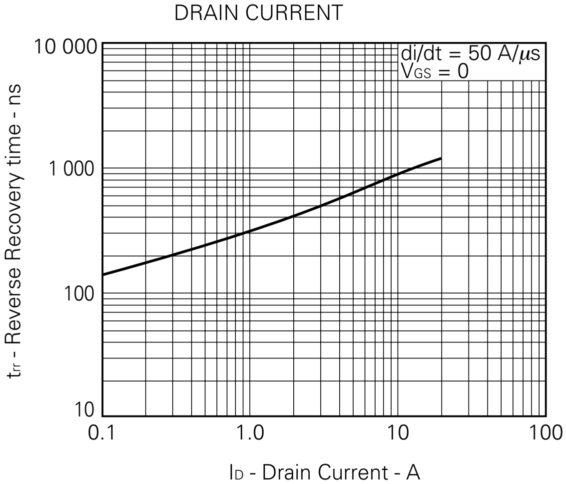
CAPACITANCE vs. DRAIN TO
SOURCE VOLTAGE



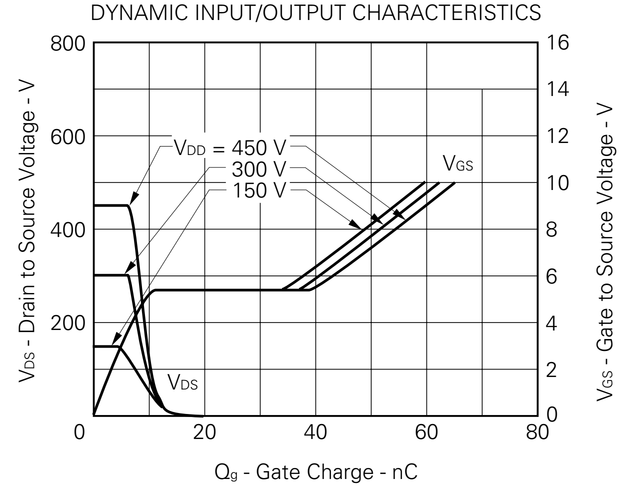
SWITCHING CHARACTERISTICS



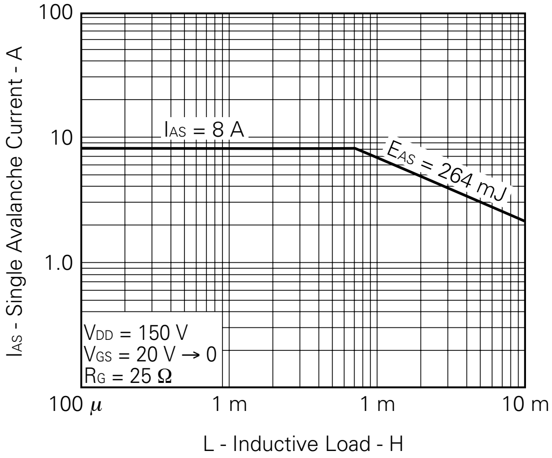
REVERSE RECOVERY TIME vs.
DRAIN CURRENT



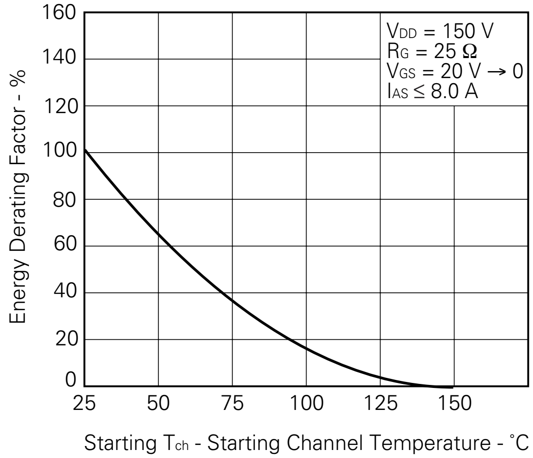
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SINGLE AVALANCHE CURRENT vs. INDUCTIVE LOAD

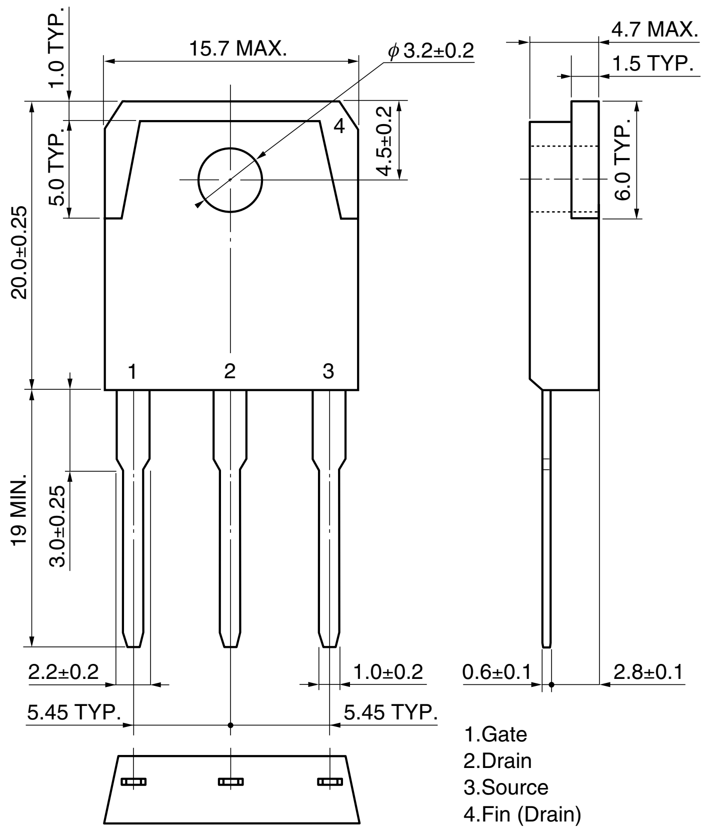


SINGLE AVALANCHE ENERGY DERATING FACTOR

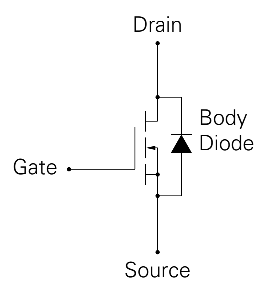


PACKAGE DRAWING (Unit: mm)

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



EQUIVALENT CIRCUIT



Remark Strong electric field, when exposed to this device, can 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.