

MOS FIELD EFFECT TRANSISTOR

2SK2487

SWITCHING

N-CHANNEL POWER MOS FET

INDUSTRIAL USE

DESCRIPTION

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

FEATURES

- Low On-Resistance
 $R_{DS(on)} = 1.6 \Omega$ ($V_{GS} = 10 V, I_D = 4.0 A$)
- Low C_{iss} $C_{iss} = 2100 pF$ TYP.
- High Avalanche Capability Ratings

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

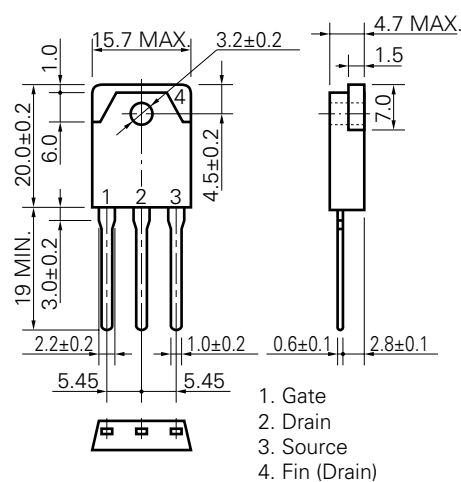
Drain to Source Voltage	V_{DSS}	900	V
Gate to Source Voltage	V_{GSS}	± 30	V
Drain Current (DC)	$I_D(DC)$	± 8.0	A
Drain Current (pulse)*	$I_D(pulse)$	± 20	A
Total Power Dissipation ($T_c = 25^\circ C$)	P_{T1}	140	W
Total Power Dissipation ($T_A = 25^\circ C$)	P_{T2}	3.0	W
Channel Temperature	T_{ch}	150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

* $PW \leq 10 \mu s$, Duty Cycle $\leq 1\%$

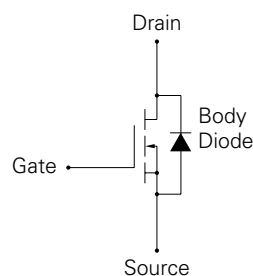
** Starting $T_{ch} = 25^\circ C$, $R_G = 25 \Omega$, $V_{GS} = 20 V \rightarrow 0$

PACKAGE DIMENSIONS

(in millimeter)



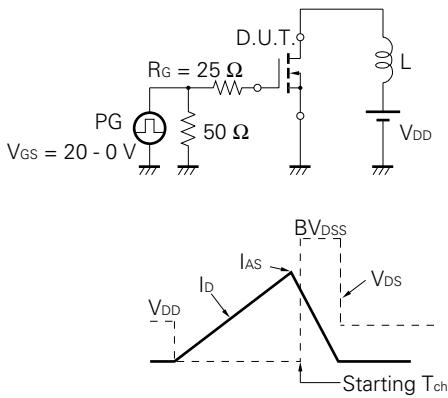
MP-88



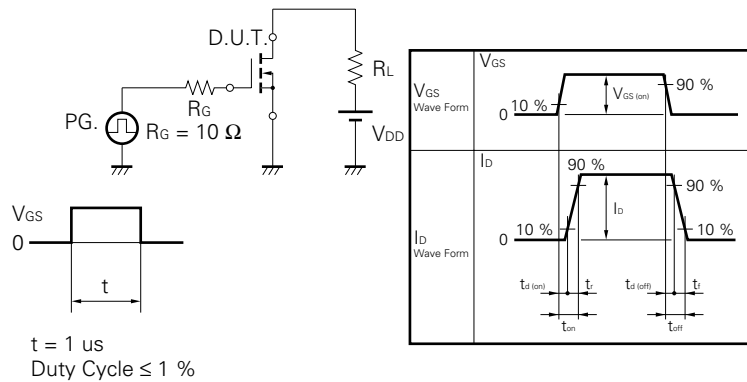
ELECTRICAL CHARACTERISTICS (TA = 25 °C)

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

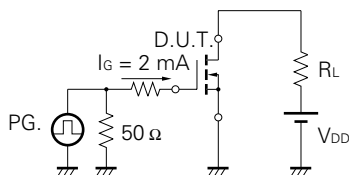
Test Circuit 1 Avalanche Capability



Test Circuit 2 Switching Time

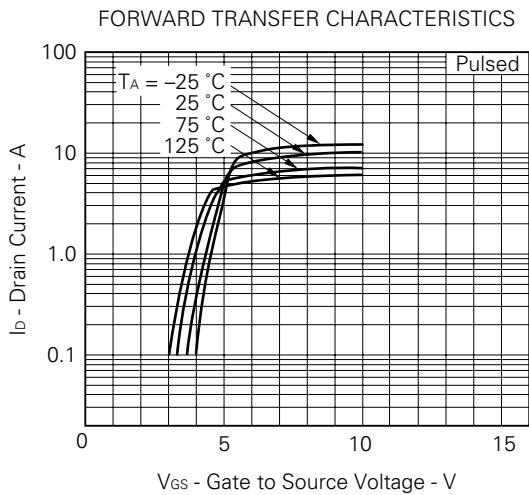
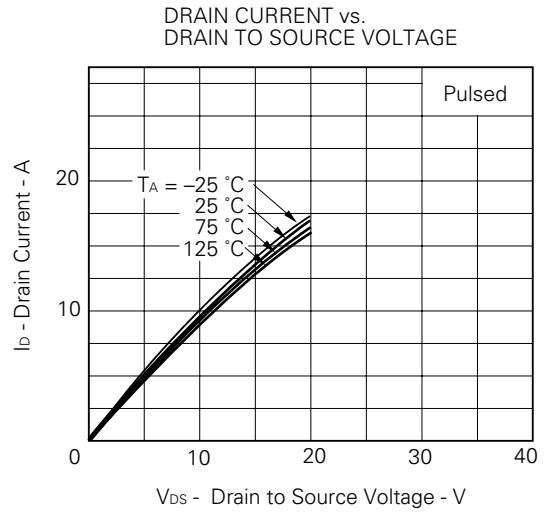
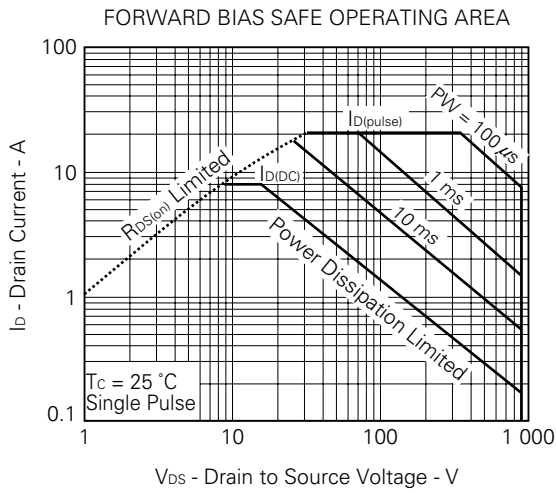
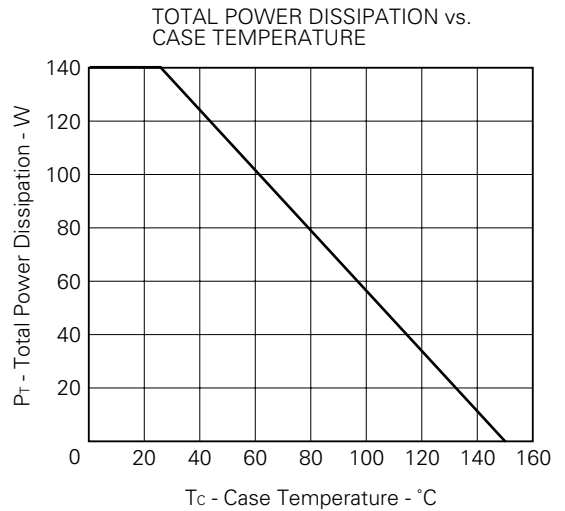
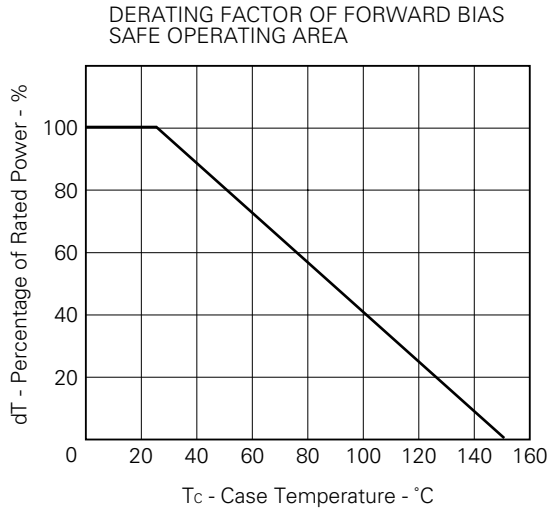


Test Circuit 3 Gate Charge

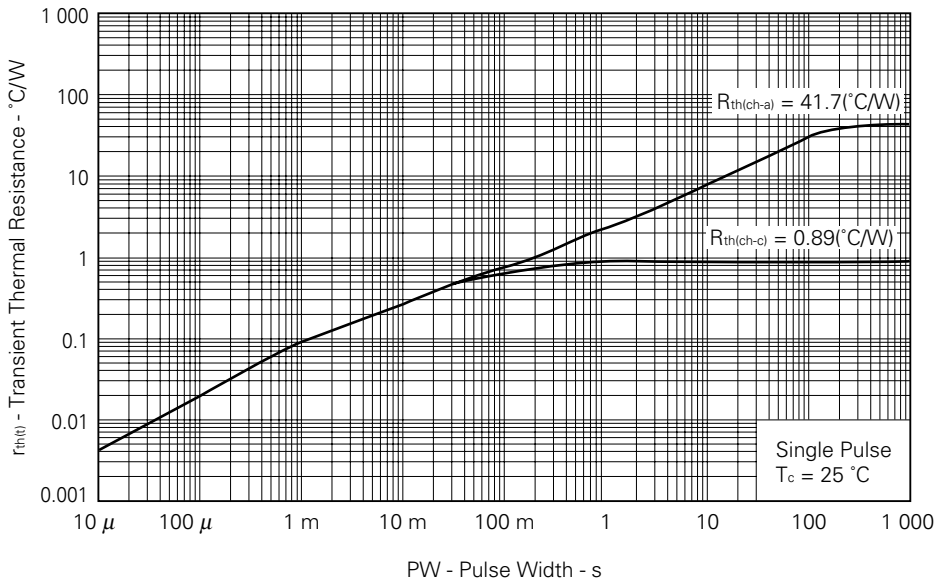


The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

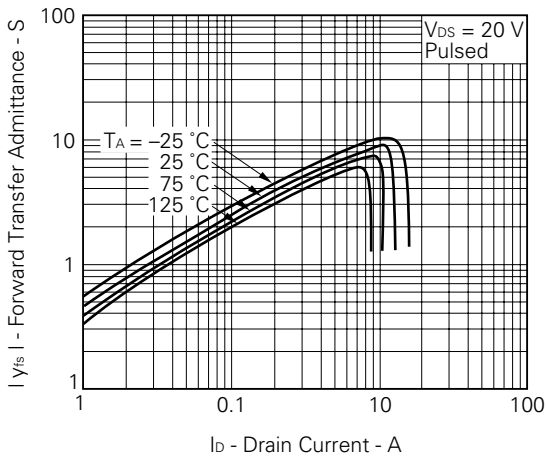
TYPICAL CHARACTERISTICS (T_A = 25 °C)



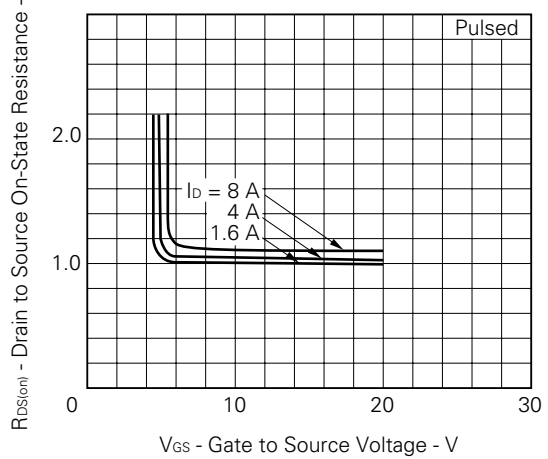
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



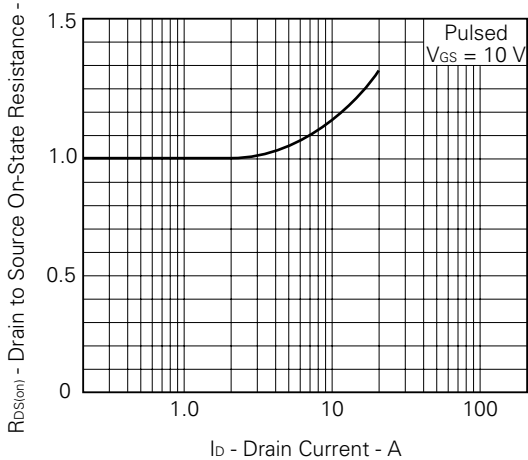
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



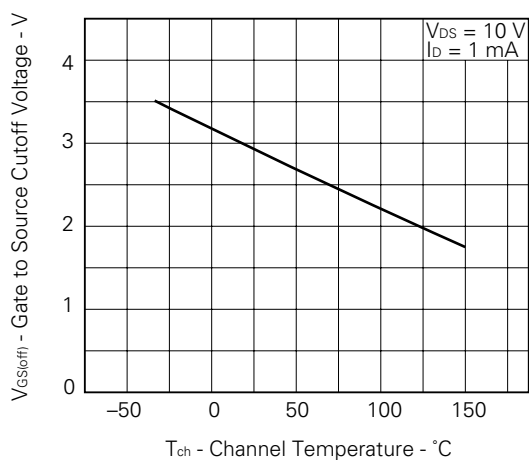
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



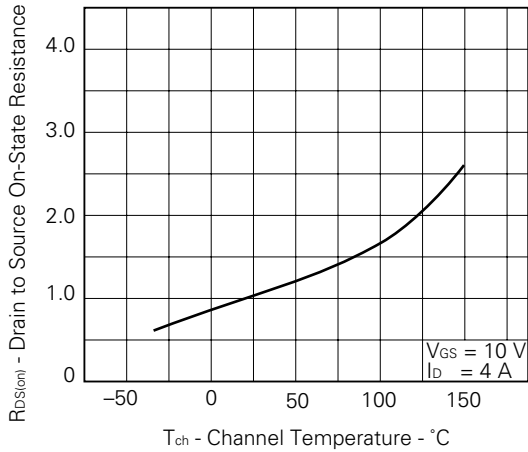
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



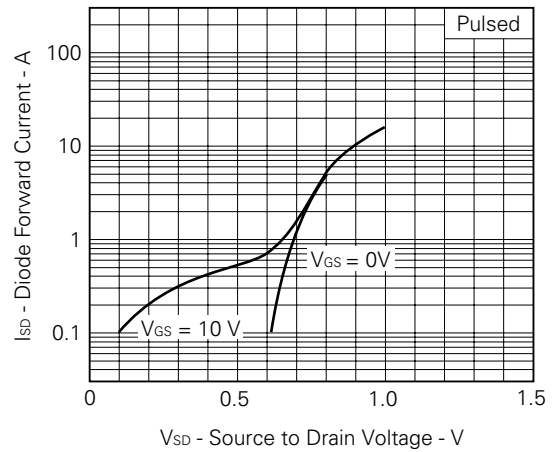
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



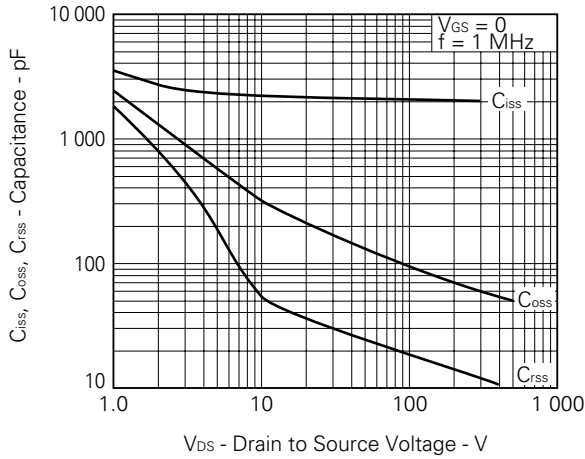
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



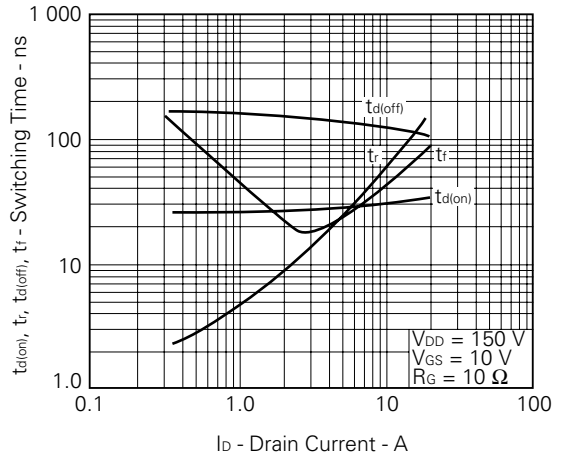
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



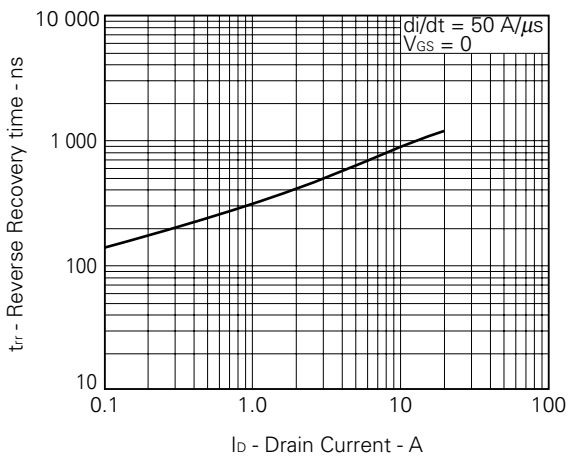
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



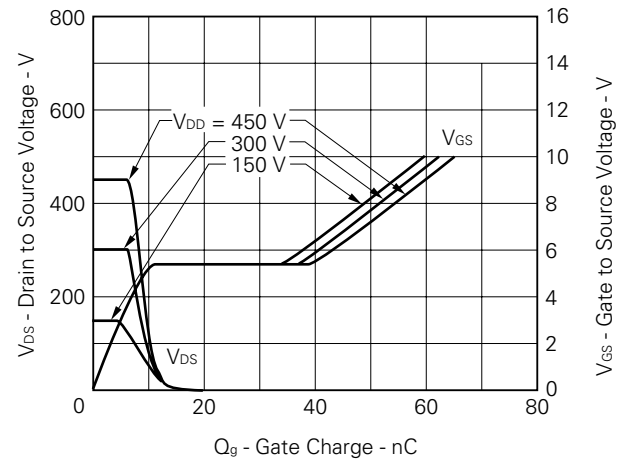
SWITCHING CHARACTERISTICS

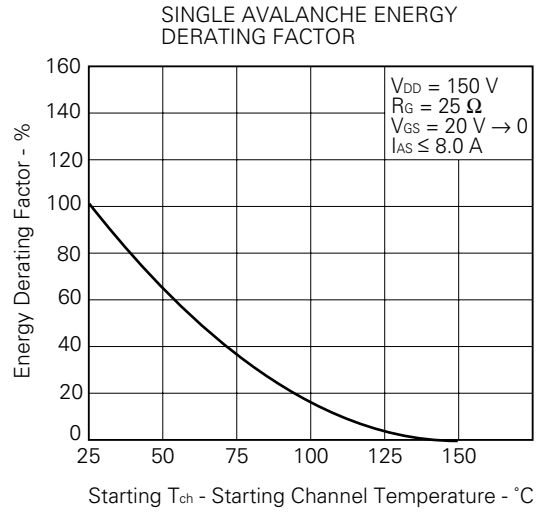
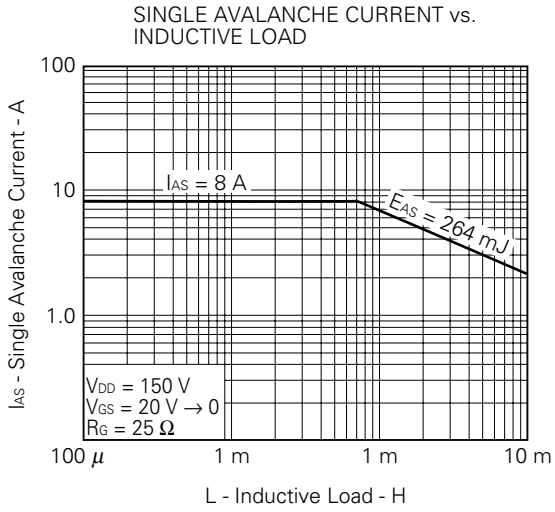


REVERSE RECOVERY TIME vs. DRAIN CURRENT



DYNAMIC INPUT/OUTPUT CHARACTERISTICS





REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system.	TEI-1202
Quality grade on NEC semiconductor devices.	IEI-1209
Semiconductor device mounting technology manual.	IEI-1207
Semiconductor device package manual.	IEI-1213
Guide to quality assurance for semiconductor devices.	MEI-1202
Semiconductor selection guide.	MF-1134
Power MOS FET features and application switching power supply.	TEA-1034
Application circuits using Power MOS FET.	TEA-1035
Safe operating area of Power MOS FET.	TEA-1037

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Anti-radioactive design is not implemented in this product.