

MOS FIELD EFFECT TRANSISTOR 2SK2983

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

This product is N-Channel MOS Field Effect Transistor designed for high current switching application.

FEATURES

· Low on-resistance

 $R_{DS(on)1} = 20 \ m\Omega \ (MAX.) \ \ (VGS = 10 \ V, \ ID = 15 \ A)$

 $R_{DS(on)2} = 27 \text{ m}\Omega \text{ (MAX.)} \text{ (Vgs} = 4.5 \text{ V, Ip} = 15 \text{ A)}$

- Low Ciss Ciss = 1200 pF TYP.
- · Built-in gate protection diode

ORDERING INFOMATION

PART NUMBER	PACKAGE
2SK2983	TO-220AB
2SK2983-S	TO-262
2SK2983-ZJ	TO-263

ABSOLUTE MAXIMUM RATINGS (TA = 25 °C)

Drain to Source Voltage Note1	VDSS	30	V
Gate to Source Voltage Note2	Vgss	±20	V
Drain Current (DC)	I _{D(DC)}	±30	Α
Drain Current (pulse) Note3	D(pulse)	±120	Α
Total Power Dissipation (TA = 25°C)	Рт	1.5	W
Total Power Dissipation (Tc = 25°C)	PT	50	W
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	-55 to +150	°C

Notes1. Vgs = 0 V

2. Vps = 0 V

3. PW \leq 10 μ s, Duty Cycle \leq 1 %

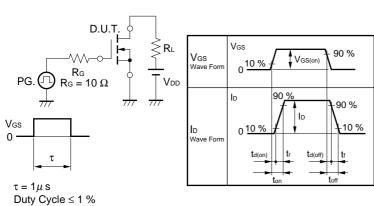
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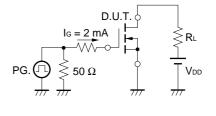
ELECTRICAL CHARACTERISTICS (TA = 25 °C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain to Source On-state Resistance	RDS(on)1	Vgs = 10 V, ID = 15 A		13.0	20.0	mΩ
	RDS(on)2	Vgs = 4.5 V, ID = 15 A		18.0	27.0	mΩ
Gate to Source Cut-off Voltage	VGS(off)	Vps = 10 V, Ip = 1 mA	1.0	1.5	2.0	V
Forward Transfer Admittance	yfs	V _{DS} = 10 V, I _D = 15 A	9.0	19		S
Drain Leakage Current	Ipss	Vps = 30 V, Vgs = 0 V			10	μΑ
Gate to Source Leakage Current	Igss	Vgs = ±20 V, Vps = 0 V			±10	μΑ
Input Capacitance	Ciss	Vps = 10 V		1200		pF
Output Capacitance	Coss	Ves = 0 V f = 1 MHz		530		pF
Reverse Transfer Capacitance	Crss			250		pF
Turn-on Delay Time	td(on)	ID = 15 A		50		ns
Rise Time	tr	$V_{GS(on)} = 10 \text{ V}$ $V_{DD} = 15 \text{ V}$ $R_G = 10 \Omega$		820		ns
Turn-off Delay Time	td(off)			100		ns
Fall Time	t _f			170		ns
Total Gate Charge	Q _G	I _D = 30 A V _{DD} = 24 V V _{GS} = 10 V		30		nC
Gate to Source Charge	Qgs			4.5		nC
Gate to Drain Charge	Q _{GD}			7.5		nC
Body Diode Forward Voltage	V _{F(S-D)}	IF = 30 A, VGS = 0 V		0.8		V
Reverse Recovery Time	trr	IF = 30 A, Vgs = 0 V		35		ns
Reverse Recovery Charge	Qrr	$di/dt = 100 \text{ A} / \mu \text{S}$		65		nC

TEST CIRCUIT 1 SWITCHING TIME

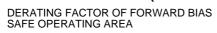


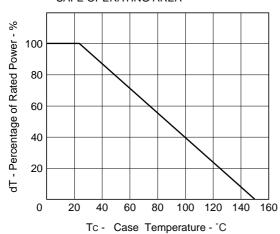
TEST CIRCUIT 2 GATE CHARGE



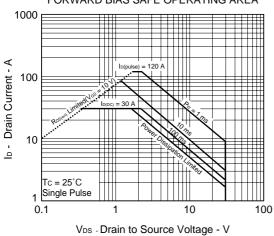


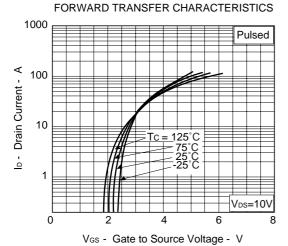
TYPICAL CHARACTERISTICS (TA = 25 °C)



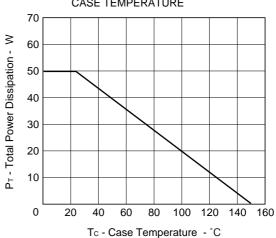


FORWARD BIAS SAFE OPERATING AREA

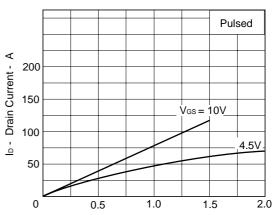




TOTAL POWER DISSIPATION vs. CASE TEMPERATURE

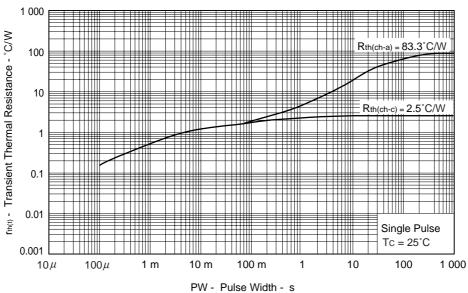


DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

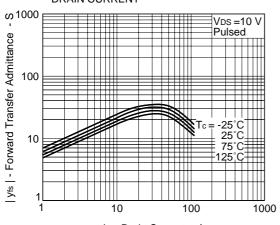


V_{DS} - Drain to Source Voltage - V

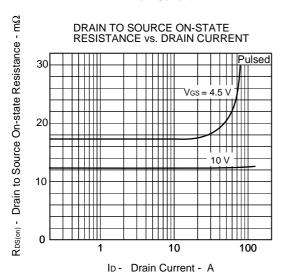
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



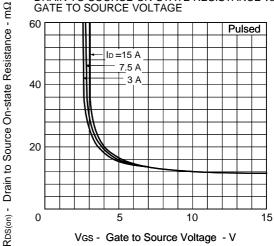
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

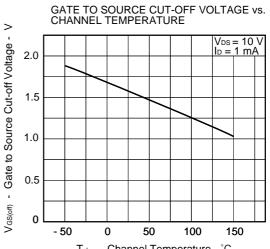


ID- Drain Current - A

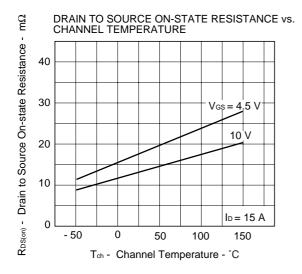


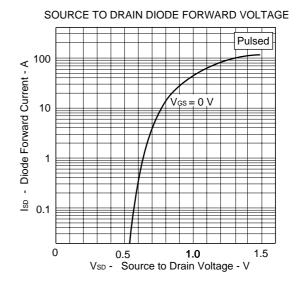
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE

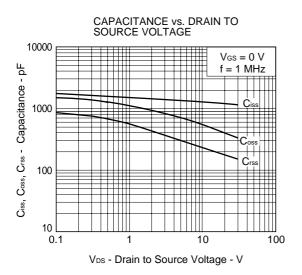


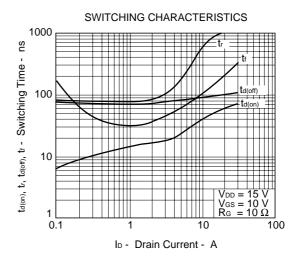


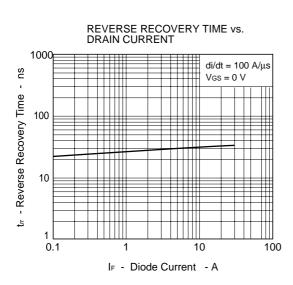
Tch - Channel Temperature - °C

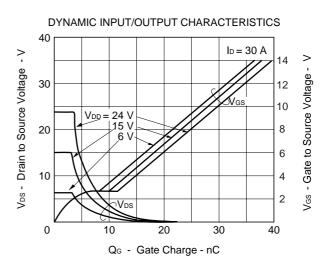








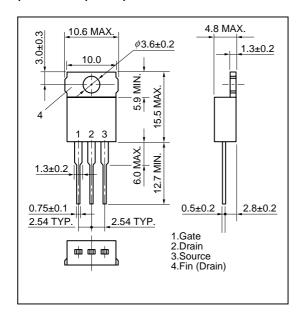




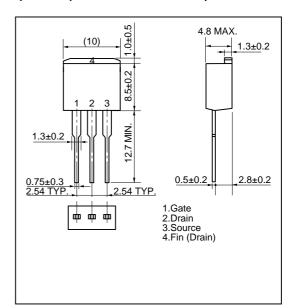


PACKAGE DRAWINGS (Unit:mm)

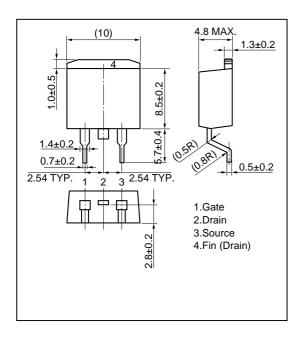
1)TO-220AB (MP-25)



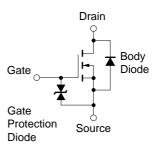
2)TO-262 (TO-220 Fin Cut:MP-25S)



3)TO-263 (JEDEC TYPE:MP-25ZJ)



EQUIVALENT CIRCUIT



Remark The diode connected between the gate and source of the transistor serves as a protector against ESD.

When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device

2SK2983



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Anti-radioactive design is not implemented in this product.

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