

MOS FIELD EFFECT TRANSISTOR 2SK2498

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

2SK2498 is N-Channel MOS Field Effect Transistor designed for high current switching applications.

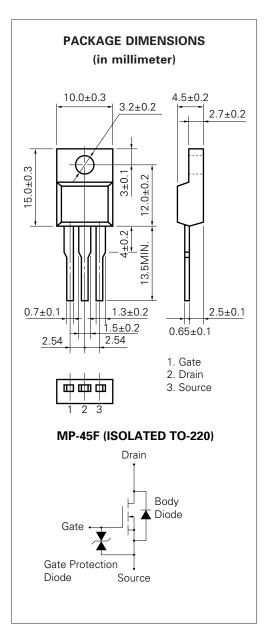
FEATURES

- Super Low On-State Resistance $R_{DS~(on)}1 \leq 9~m\Omega~(V_{GS}=10~V,~I_{D}=25~A)$ $R_{DS~(on)}2 \leq 14~m\Omega~(V_{GS}=4~V,~I_{D}=25~A)$
- Low Ciss Ciss = 3400 pF TYP.
- High Avalanche Capability Ratings
- · Isolate TO-220 Package
- · Buit-in G-S Protection Diode

ABSOLUTE MAXIMUM RATINGS (TA = 25 °C)

Drain to Source Voltage	VDSS	60	V
Gate to Source Voltage	Vgss	±20	V
Drain Current (DC)	$I_{D(DC)}$	±50	Α
Drain Current (pulse)*	ID(pulse)	±200	Α
Total Power Dissipation ($T_c = 25$ °C)	P _{T1}	35	W
Total Power Dissipation (T _A = 25 °C)	P _{T2}	2.0	W
Channel Temperature	T_ch	150	°C
Storage Temperature	T _{stg} -	-55 to +150	°C
Single Avalanche Current**	las	50	Α
Single Avalanche Energy**	Eas	250	mJ

- * PW \leq 10 μ s, Duty Cycle \leq 1 %
- ** Starting T_{ch} = 25 °C, R_G = 25 Ω , V_{GS} = 20 V \rightarrow 0



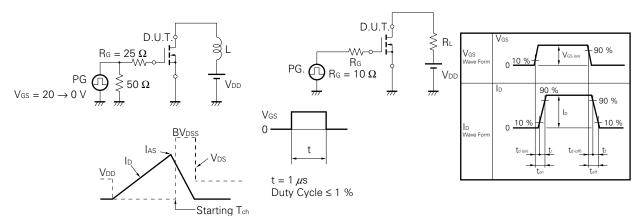


ELECTRICAL CHARACTERISTICS (TA = 25 °C)

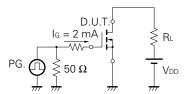
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-Resistance	RDS (on)1		7.3	9.0	mΩ	Vgs = 10 V, ID = 25 A
	RDS (on)2		11	14	mΩ	Vgs = 4 V, ID = 25 A
Gate to Source Cutoff Voltage	VGS (off)	1.0	1.5	2.0	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	l y _{fs} l	20	58		S	V _{DS} = 10 V, I _D = 25 A
Drain Leakage Current	IDSS			10	μΑ	V _{DS} = 60 V, V _{GS} = 0
Gate to Source Leakage Current	Igss			±10	nA	$V_{GS} = \pm 20 \text{ V, } V_{DS} = 0$
Input Capacitance	Ciss		3400		pF	V _{DS} = 10 V
Output Capacitance	Coss		1600		pF	V _G S = 0
Reverse Transfer Capacitance	Crss		770		pF	f = 1 MHz
Turn-On Delay Time	td (on)		55		ns	ID = 25 A
Rise Time	tr		360		ns	V _{GS(on)} = 10 V
Turn-Off Delay Time	td (off)		480		ns	V _{DD} = 30 V
Fall Time	tf		360		ns	$R_G = 10 \Omega$
Total Gate Charge	QG		152		nC	ID = 50 A
Gate to Source Charge	Qgs		11		nC	V _{DD} = 48 V
Gate to Drain Charge	QGD		60		nC	V _{GS} = 10 V
Body Diode Forward Voltage	VF (S-D)		0.92		V	IF = 50 A, VGS = 0
Reverse Recovery Time	trr		105		ns	IF = 50 A, VGS = 0
Reverse Recovery Charge	Qrr		265		μC	di/dt = 100 A/μs

Test Circuit 1 Avalanche Capability

Test Circuit 2 Switching Time



Test Circuit 3 Gate Charge

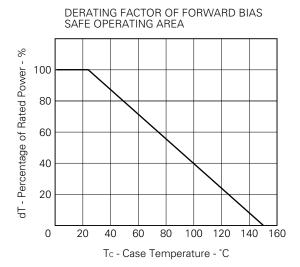


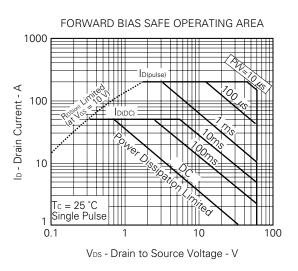
The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

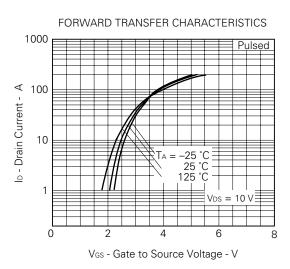
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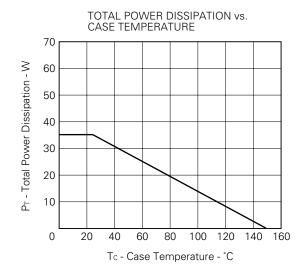


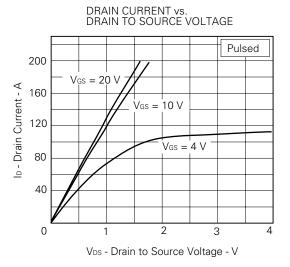
TYPICAL CHARACTERISTICS (TA = 25 °C)





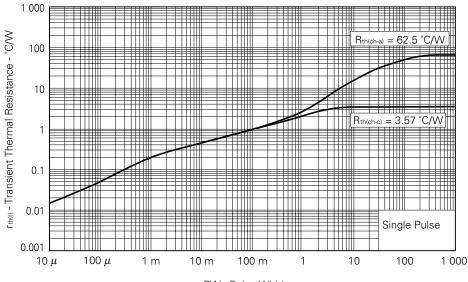






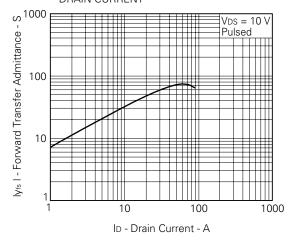
NEC

TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH

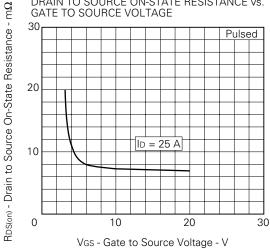


PW - Pulse Width - s

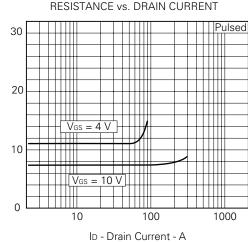




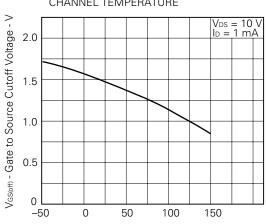
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



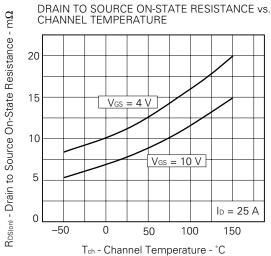
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE

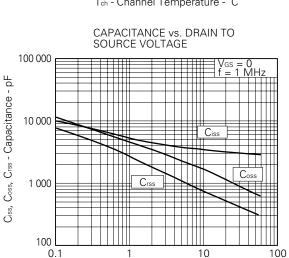


Tch - Channel Temperature - °C

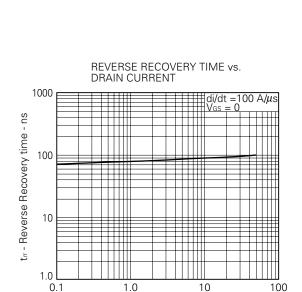
 $\mathsf{Res}_{\text{(on)}}$ - Drain to Source On-State Resistance - $\mathsf{m}\Omega$



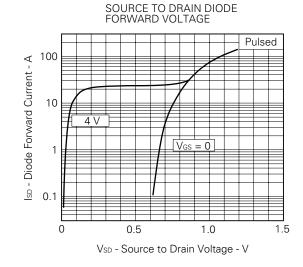


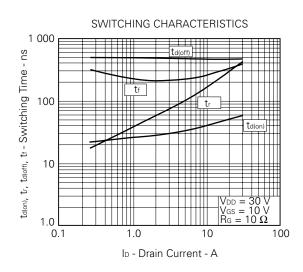


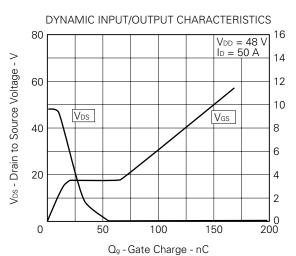
V_{DS} - Drain to Source Voltage - V



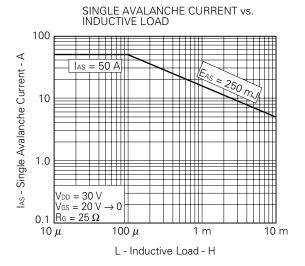
ID - Drain Current - A

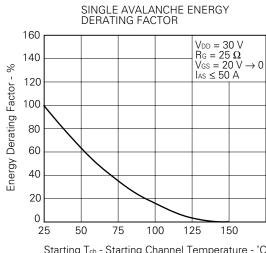














REFERENCE

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

The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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Anti-radioactive design is not implemented in this product.