

MOS FIELD EFFECT TRANSISTOR 2SK3299

SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

DESCRIPTION

The 2SK3299 is N-Channel MOS FET device that features a low gate charge and excellent switching characteristics, designed for high voltage applications such as switching power supply, AC adapter.

ORDERING INFORMATION

PART NUMBER	PACKAGE		
2SK3299	TO-220AB		
2SK3299-S	TO-262		
2SK3299-ZJ	TO-263		

FEATURES

- •Low gate charge
- $Q_G = 34$ nC TYP. ($V_{DD} = 450$ V, $V_{GS} = 10$ V, $I_D = 10$ A)
- •Gate voltage rating ±30 V
- •Low on-state resistance

 $R_{DS(on)} = 0.75 \Omega MAX. (Vgs = 10 V, ID = 5.0 A)$

- Avalanche capability ratings
- •Surface mount package available

ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

Drain to Source Voltage (Vgs = 0 V)	VDSS	600	V
Gate to Source Voltage (Vps = 0 V)	Vgss	±30	V
Drain Current (DC) (Tc = 25°C)	I _{D(DC)}	±10	Α
Drain Current (Pulse) Note1	D(pulse)	±40	Α
Total Power Dissipation (T _A = 25°C)	P _{T1}	1.5	W
Total Power Dissipation (Tc = 25°C)	P _{T2}	75	W
Channel Temperature	Tch	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C
Single Avalanche Current Note2	IAS	10	Α
Single Avalanche Energy Note2	Eas	66.7	mJ

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

2. Starting T_{ch} = 25°C, V_{DD} = 150 V, R_G = 25 Ω , V_{GS} = 20 V \rightarrow 0 V

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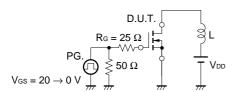
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

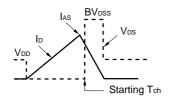


ELECTRICAL CHARACTERISTICS(TA = 25°C)

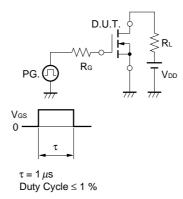
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Leakage Current	Ioss	V _{DS} = 600 V, V _{GS} = 0 V			100	μΑ
Gate Leakage Current	Igss	Vgs = ±30 V, Vps = 0 V			±100	nA
Gate Cut-off Voltage	V _G S(off)	V _{DS} = 10 V, I _D = 1 mA	2.5		3.5	V
Forward Transfer Admittance	yfs	V _{DS} = 10 V, I _D = 5.0 A	3.2			S
Drain to Source On-state Resistance	RDS(on)	Vgs = 10 V, ID = 5.0 A		0.68	0.75	Ω
Input Capacitance	Ciss	V _{DS} = 10 V		1580		pF
Output Capacitance	Coss	Vgs = 0 V		280		pF
Reverse Transfer Capacitance	Crss	f = 1 MHz		25		pF
Turn-on Delay Time	td(on)	V _{DD} = 150 V, I _D = 5.0 A		27		ns
Rise Time	tr	Vgs(on) = 10 V		17		ns
Turn-off Delay Time	td(off)	R _G = 10 Ω		66		ns
Fall Time	tf			24		ns
Total Gate Charge	QG	V _{DD} = 450 V		34		nC
Gate to Source Charge	Qgs	Vgs = 10 V		8.2		nC
Gate to Drain Charge	Q _{GD}	ID = 10 A		12.3		nC
Diode Forward Voltage	VF(S-D)	IF = 10 A, VGS = 0 V		1.0		V
Reverse Recovery Time	trr	IF = 10 A, VGS = 0 V		1.9		μs
Reverse Recovery Charge	Qrr	di/dt = 50 A/μs		12		μC

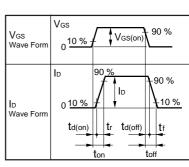
TEST CIRCUIT 1 AVALANCHE CAPABILITY





TEST CIRCUIT 2 SWITCHING TIME



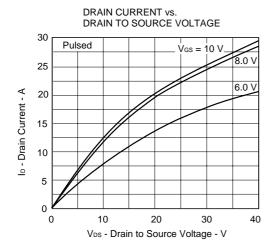


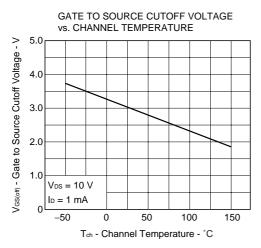
TEST CIRCUIT 3 GATE CHARGE

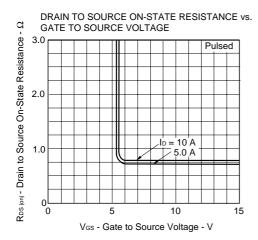
$$\begin{array}{c|c} D.U.T. & \\ \hline \\ I_G = 2 \text{ mA} \\ \hline \\ PG. & \\ \hline \\ \end{array} \begin{array}{c} R_L \\ \hline \\ V_{DD} \\ \hline \end{array}$$

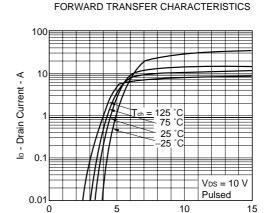


★ TYPICAL CHARACTERISTICS (TA = 25 °C)

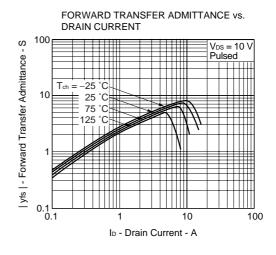


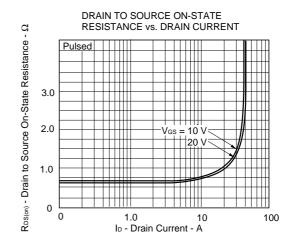


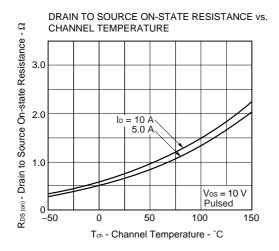


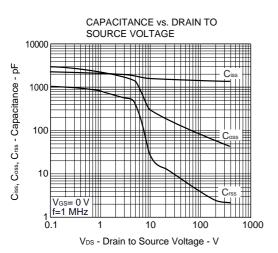


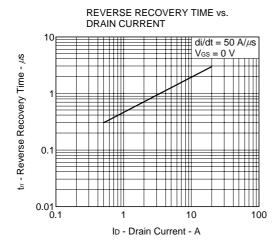
V_{GS} - Gate to Source Voltage - V

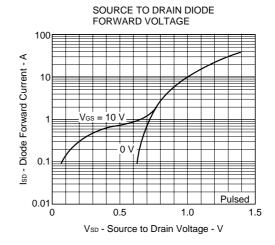


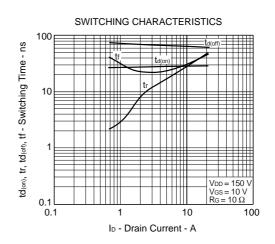


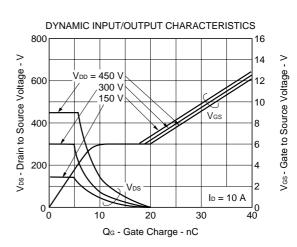


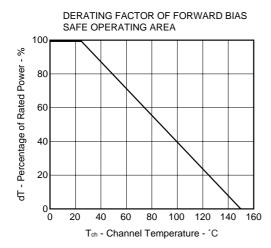


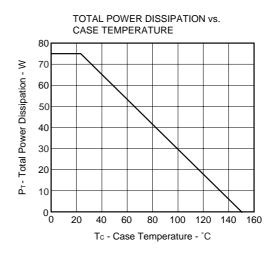


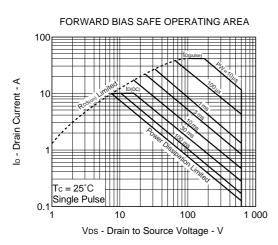




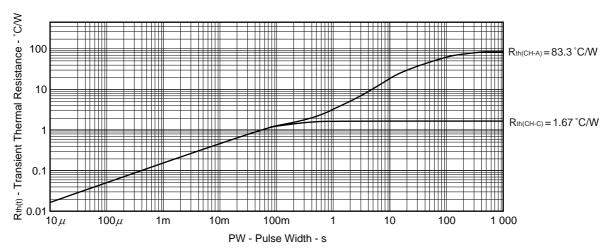




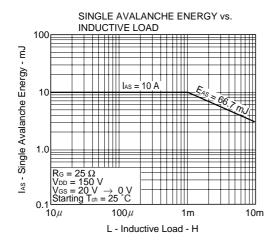


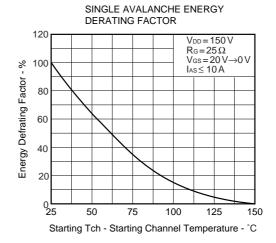


TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



2SK3299

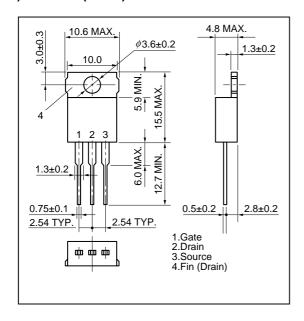




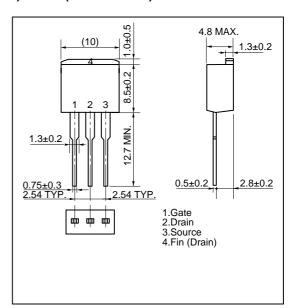


PACKAGE DRAWINGS (Unit:mm)

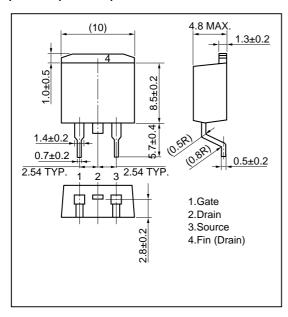
1)TO-220AB (MP-25)



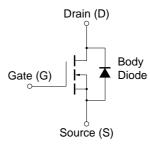
2)TO-262 (MP-25 Fin Cut)



3)TO-263 (MP-25ZJ)



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.

NEC 2SK3299

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 - Specific: Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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