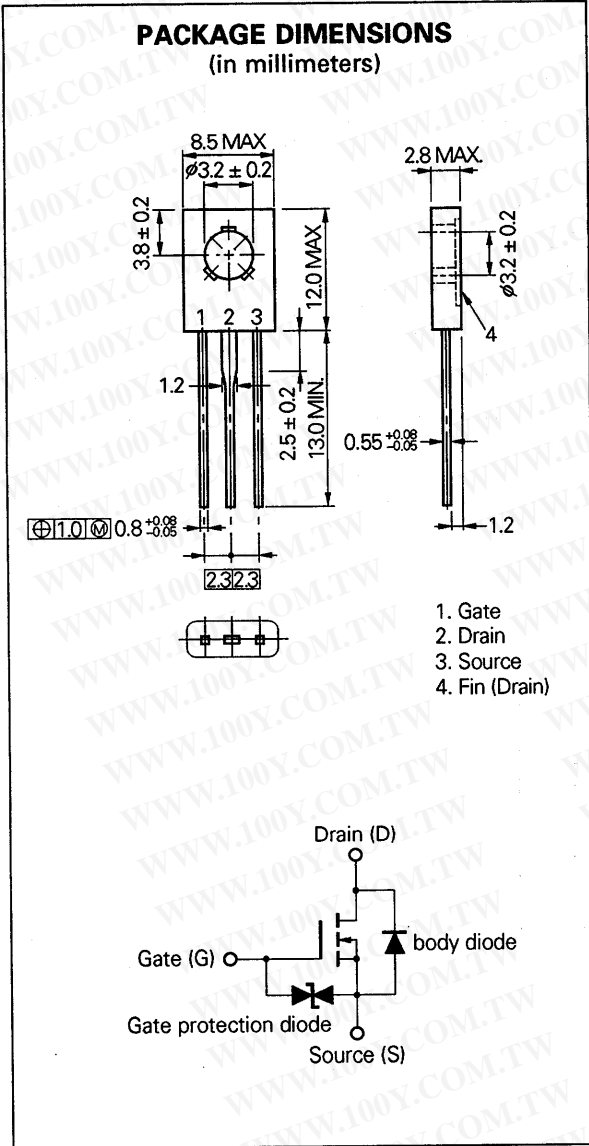


N-CHANNEL MOS FIELD EFFECT POWER TRANSISTOR
2SK1285

SWITCHING
N-CHANNEL POWER MOS FET
INDUSTRIAL USE



DESCRIPTION

The 2SK1285 is N-channel MOS Field Effect Transistor designed for solenoid, motor and lamp driver.

FEATURES

- Low On-state Resistance
 $R_{DS(on)} \leq 0.32 \Omega$ MAX. ($V_{GS} = 10 V, I_D = 2 A$)
 $R_{DS(on)} \leq 0.40 \Omega$ MAX. ($V_{GS} = 4 V, I_D = 2 A$)
- Low C_{iss} $C_{iss} = 500 pF$ TYP.
- Built-in G-S Gate Protection Diodes

QUALITY GRADE

Standard
 Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures			
Storage Temperature		-55 to +150	°C
Channel Temperature		150	°C MAX.
Maximum Power Dissipation			
Total Power Dissipation ($T_a = 25^\circ C$)	1.3		W
Total Power Dissipation ($T_c = 25^\circ C$)	20		W
Maximum Voltages and Currents ($T_a = 25^\circ C$)			
V_{DSS}	Drain to Source Voltage	100	V
$V_{GSS(AC)}$	Gate to Source Voltage	±20	V
$I_{D(DC)}$	Drain Current (DC)	±3.0	A
$I_{D(pulse)*}$	Drain Current (pulse)	±12	A

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

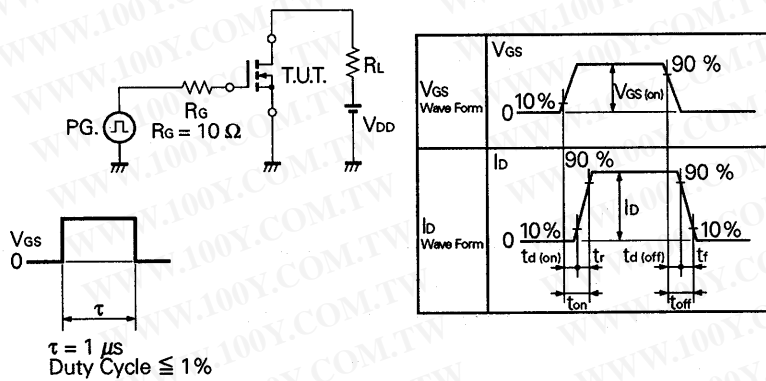
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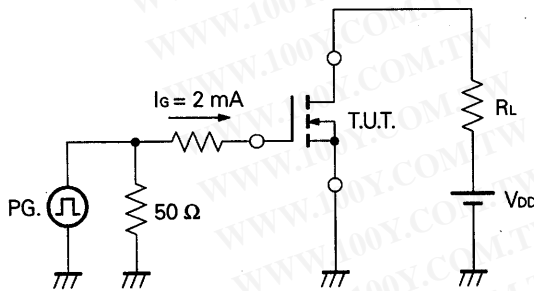
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source On-state Resistance	R _{DS(on)}		0.26	0.32	Ω	V _{GS} = 10 V, I _D = 2 A
Drain to Source On-state Resistance	R _{DS(on)}		0.32	0.40	Ω	V _{GS} = 4.0 V, I _D = 2 A
Gate to Source Cutoff Voltage	V _{GS(off)}	1.0		2.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance	y _{fs}	2.4			S	V _{DS} = 10 V, I _D = 2 A
Drain Leakage Current	I _{DSS}			10	μA	V _{DS} = 100 V, V _{GS} = 0
Gate to Source Leakage Current	I _{GSS}			±10	μA	V _{GS} = ±20 V, V _{DS} = 0
Input Capacitance	C _{iss}		500		pF	V _{DS} = 10 V
Output Capacitance	C _{oss}		160		pF	V _{GS} = 0
Reverse Transfer Capacitance	C _{rss}		20		pF	f = 1 MHz
Turn-On Delay Time	t _{d(on)}		40		ns	V _{GS(on)} = 10 V V _{DD} = 50 V I _D = 2 A, R _G = 10 Ω R _L = 25 Ω
Rise Time	t _r		55		ns	
Turn-Off Delay Time	t _{d(off)}		500		ns	
Fall Time	t _f		120		ns	
Total Gate Charge	Q _G		13		nC	V _{GS} = 10 V I _D = 3 A V _{DD} = 80 V
Gate to Source Charge	Q _{GS}		3		nC	
Gate to Drain Charge	Q _{GD}		2		nC	
Diode Forward Voltage	V _{SD}		0.9		V	I _{SD} = 3 A, V _{GS} = 0
Reverse Recovery Time	t _{rr}		140		ns	I _F = 3 A, V _{GS} = 0
Reverse Recovery Charge	Q _{rr}		250		nC	di/dt = 50 A/μs

Test Circuit 1: Switching Time



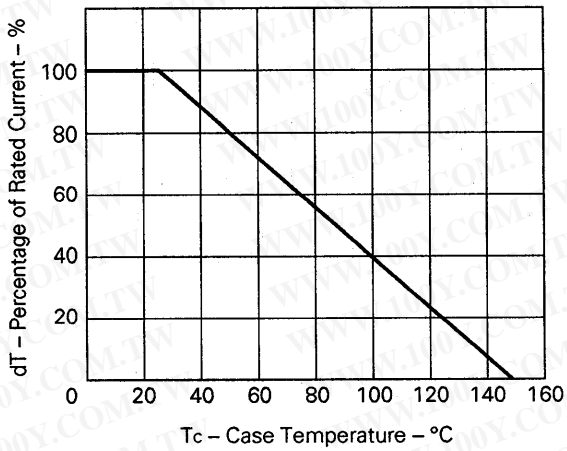
Test Circuit 2: Gate Charge



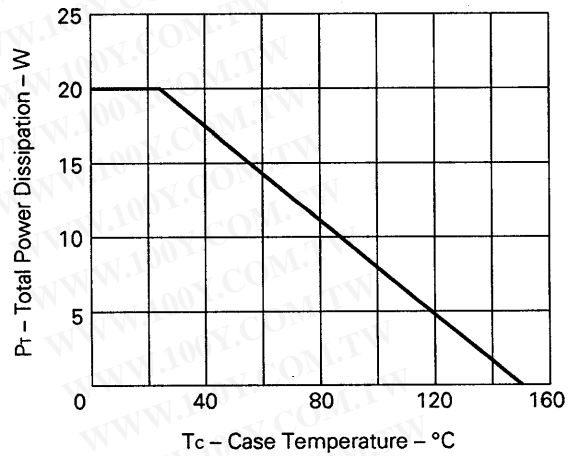
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TYPICAL CHARACTERISTICS (T_a = 25 °C)

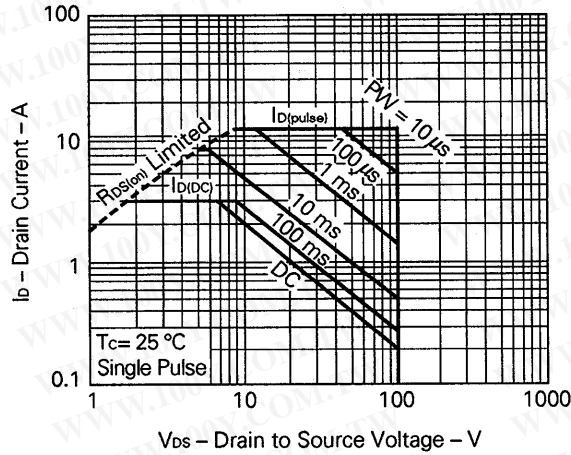
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



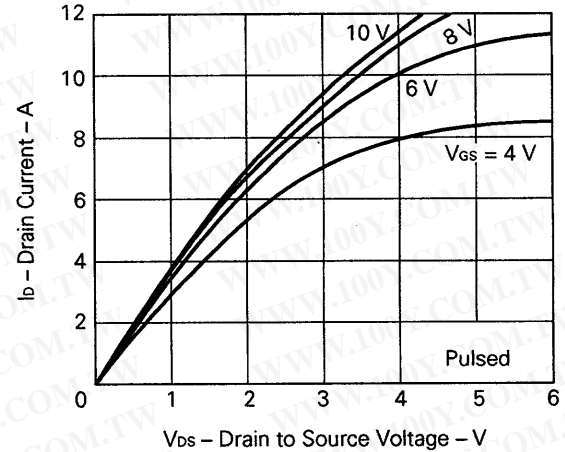
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



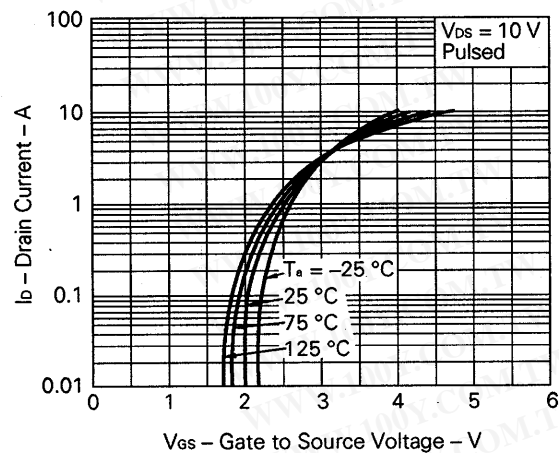
FORWARD BIAS SAFE OPERATING AREA



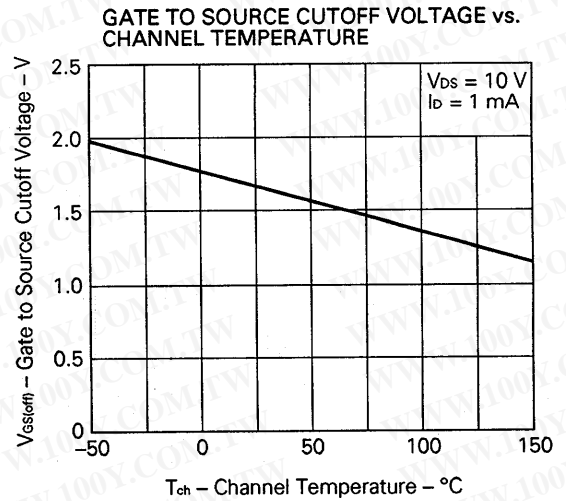
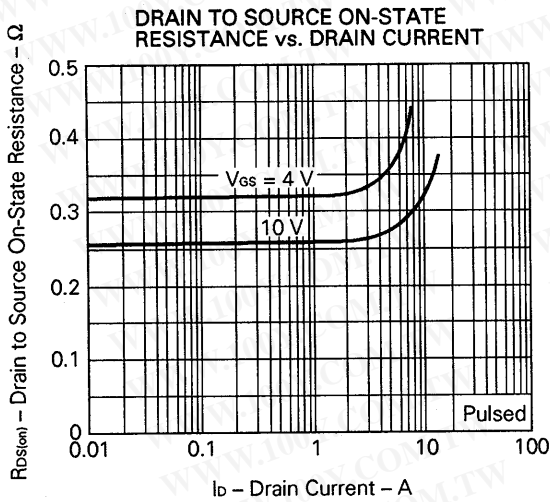
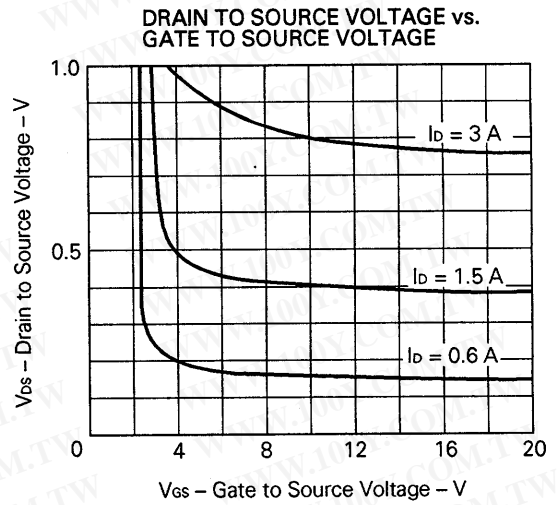
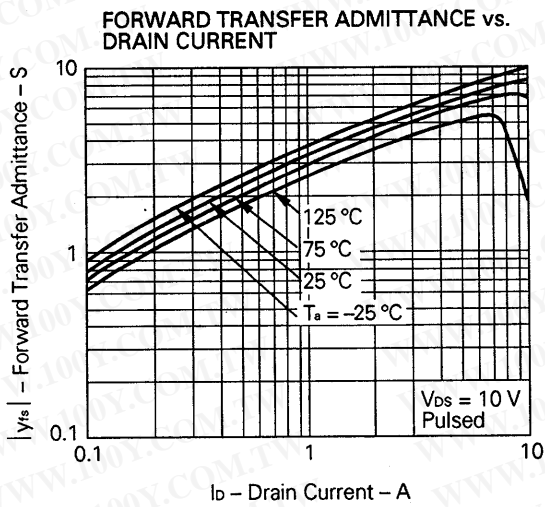
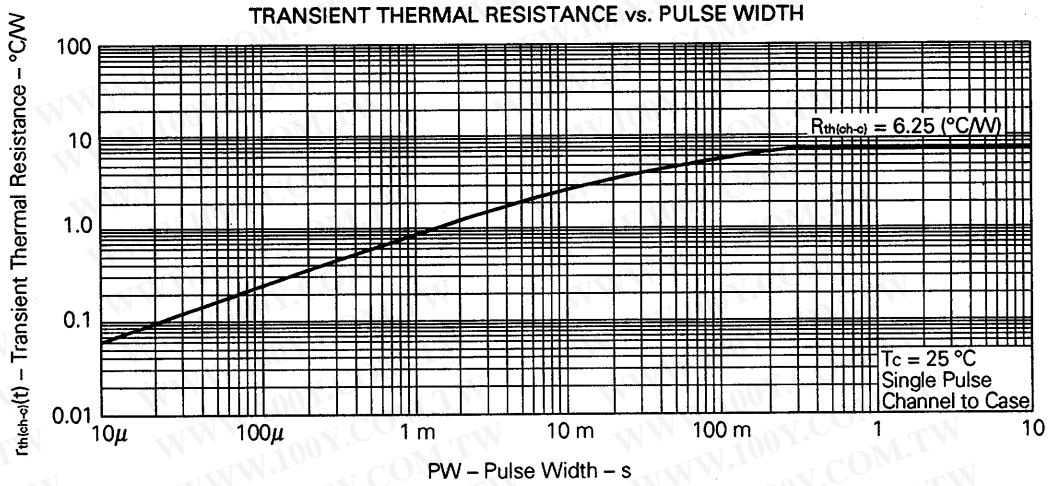
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



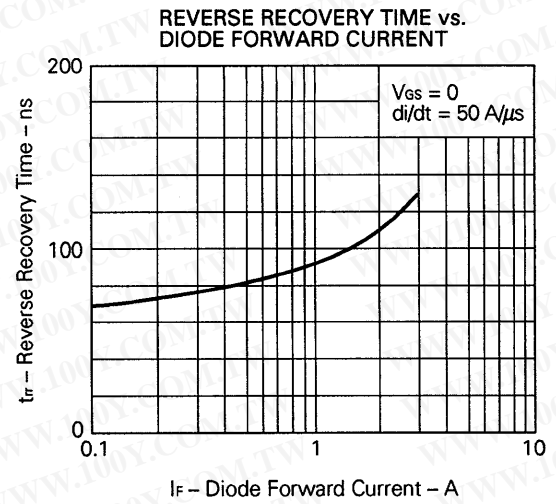
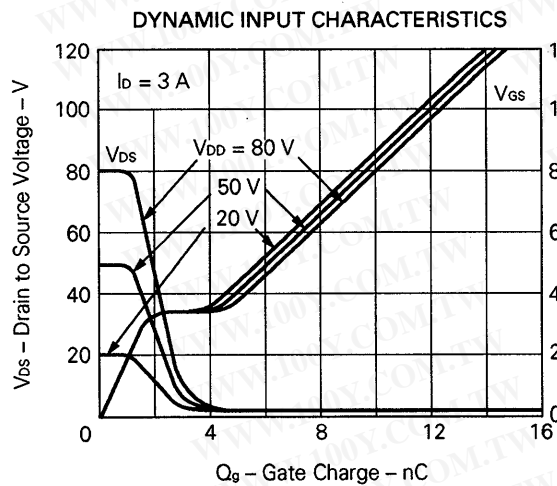
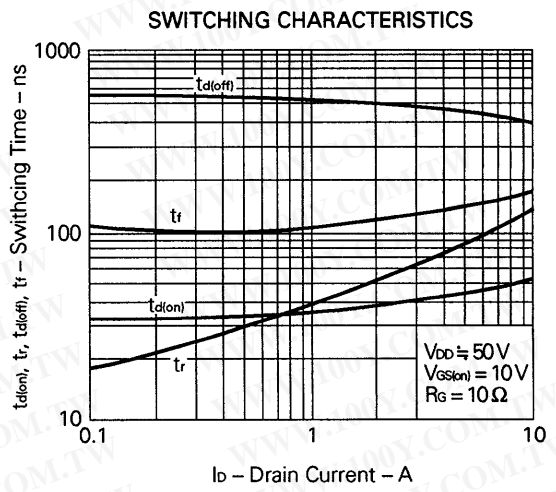
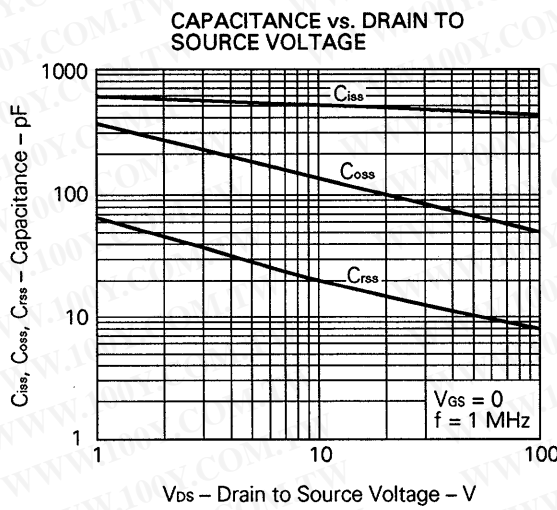
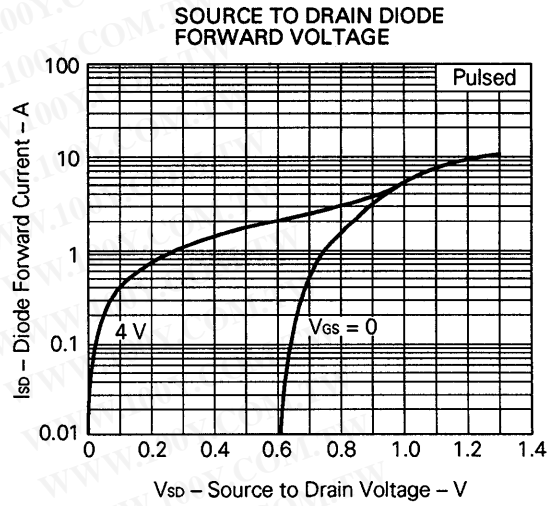
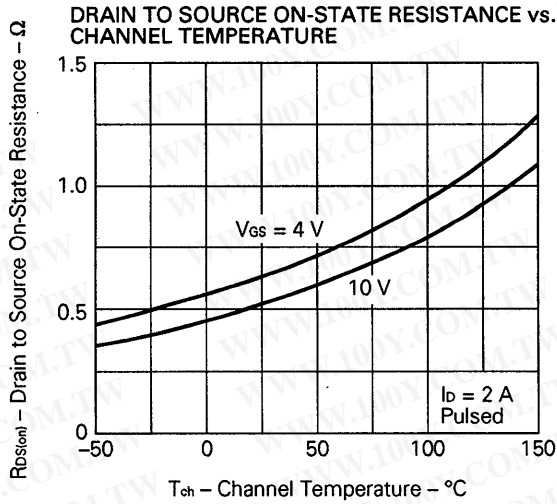
TRANSFER CHARACTERISTICS



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Reference

Application note name	No.
Safe operating area of Power MOS FET.	TEA-1034
Application circuit using Power MOS FET.	TEA-1035
Quality control of NEC semiconductors devices.	TEI-1202
Quality control guide of semiconductors devices.	MEI-1202
Assembly manual of semiconductors devices.	IEI-1207

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