

TOSHIBA

2SK2889

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (π -MOS V)

2SK2889

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.54 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 9.0 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DSS} = 600 V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0 V$
($V_{DS} = 10 V, I_D = 1 mA$)

MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	600	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)		V_{DGR}	600	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	10	A
	Pulse	I_{DP}	40	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	100	W
Single Pulse Avalanche Energy**		E_{AS}	363	mJ
Avalanche Current		I_{AR}	10	A
Repetitive Avalanche Energy*		E_{AR}	10	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.25	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^\circ C / W$

Note ;

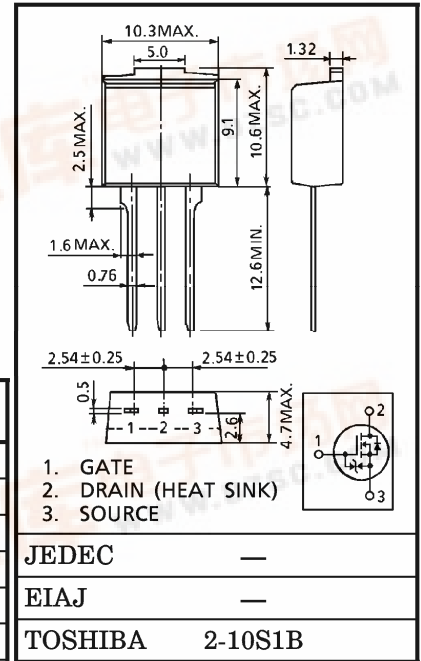
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = 90 V$, Starting $T_{ch} = 25^\circ C$, $L = 6.36 mH$
 $R_G = 25 \Omega$, $I_{AR} = 10 A$

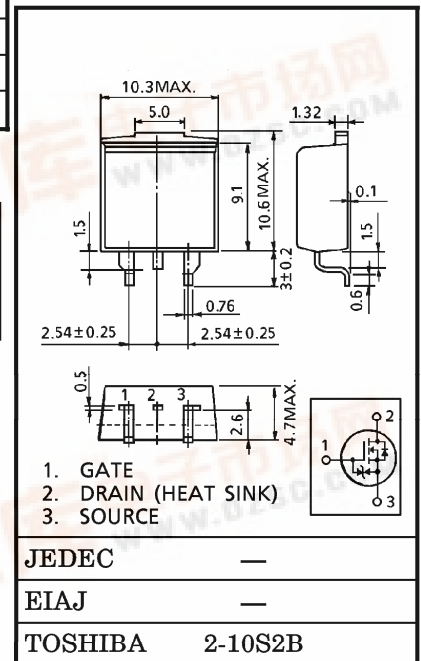
This transistor is an electrostatic sensitive device.
Please handle with caution.

INDUSTRIAL APPLICATIONS

Unit in mm



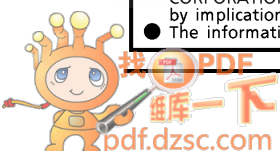
Weight : 1.5 g



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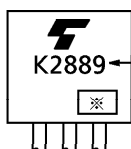
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±25 V, V _{DS} = 0 V	—	—	±10	μA
Gate-Source Breakdown Voltage		V (BR) GSS	I _G = ±10 μA, V _{DS} = 0 V	±30	—	—	V
Drain Cut-off Current		I _{DSS}	V _{DS} = 600 V, V _{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V (BR) DSS	I _D = 10 mA, V _{GS} = 0 V	600	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.0	—	4.0	V
Drain-Source ON Resistance		R _{DS (ON)}	V _{GS} = 10 V, I _D = 5 A	—	0.54	0.75	Ω
Forward Transfer Admittance		Y _{fs}	V _{DS} = 10 V, I _D = 5 A	3.0	9.0	—	S
Input Capacitance		C _{iSS}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	2040	—	pF
Reverse Transfer Capacitance		C _{rSS}		—	230	—	
Output Capacitance		C _{oss}		—	590	—	
Switching Time	Rise Time	t _r	<p>V_{GS} 10 V 0 V 50 Ω I_D = 5 A V_{out} R_L = 40 Ω V_{DD} ≅ 200 V</p>	—	22	—	ns
	Turn-on Time	t _{on}		—	58	—	
	Fall Time	t _f		—	36	—	
	Turn-off Time	t _{off}		—	190	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≅ 400 V, V _{GS} = 10 V, I _D = 10 A	—	45	—	nC
Gate-Source Charge		Q _{gs}		—	25	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	20	—	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	10	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	40	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 10 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = 10 A, V _{GS} = 0 V	—	1300	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} / dt = 100 A / μs	—	16	—	nC

MARKING

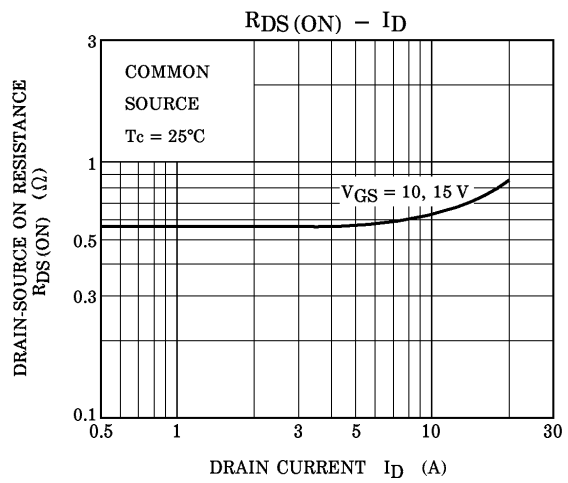
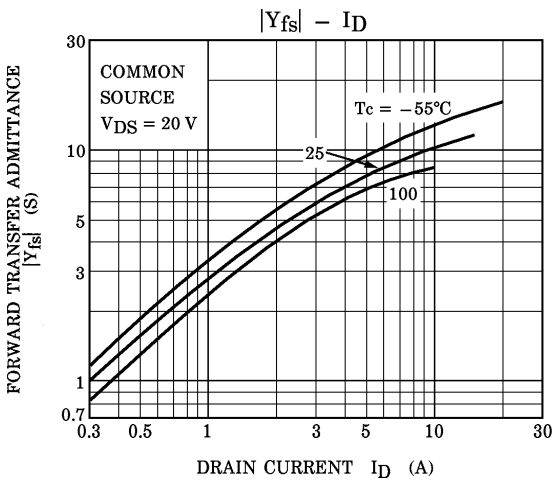
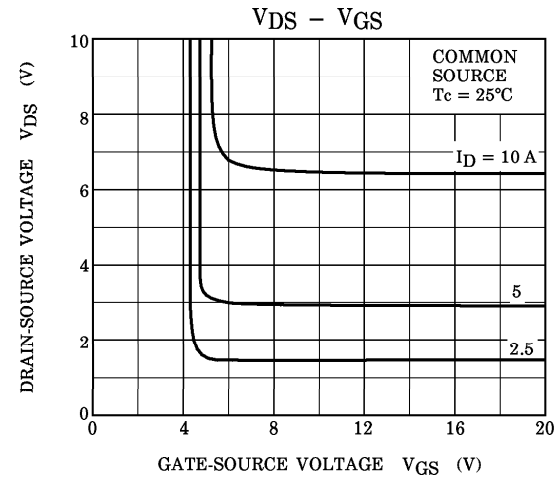
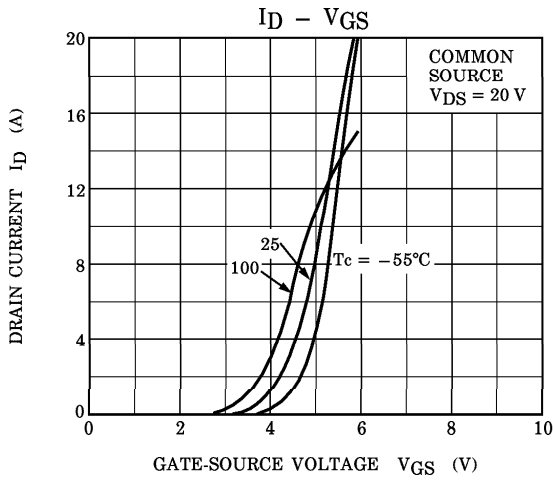
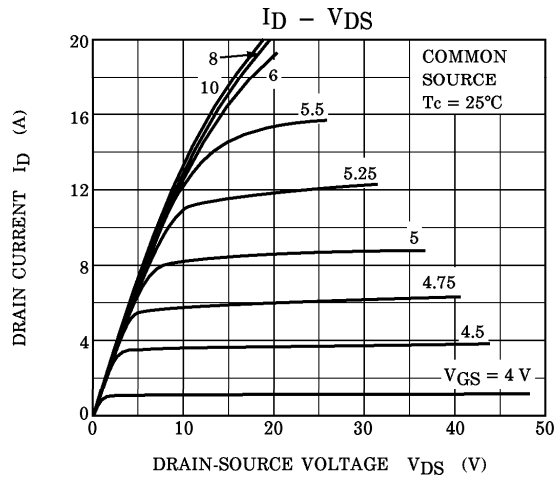
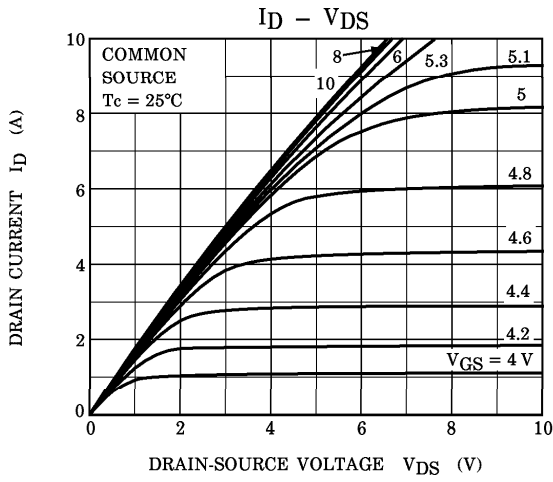


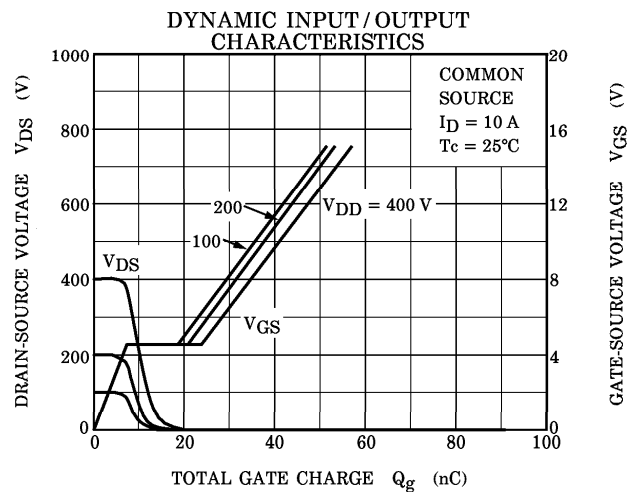
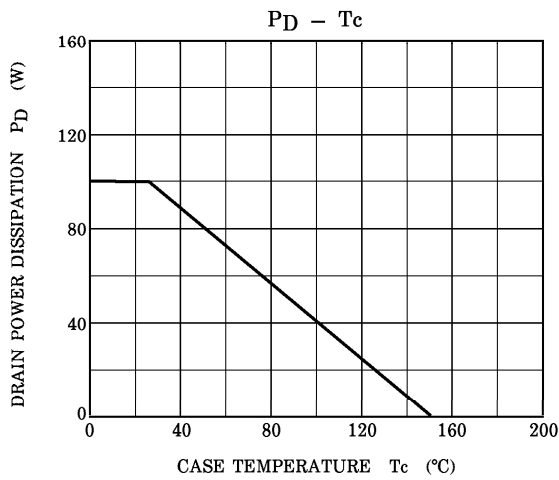
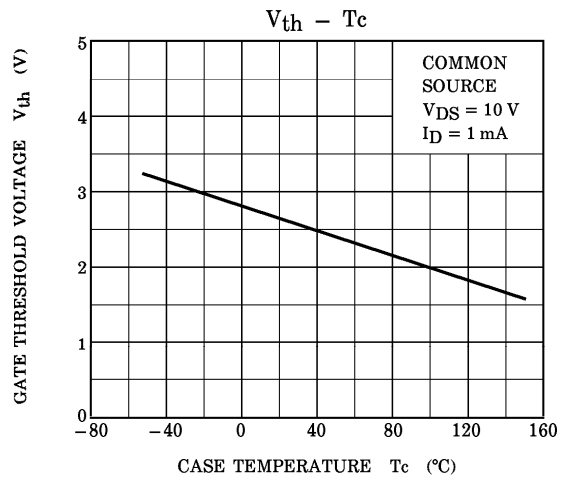
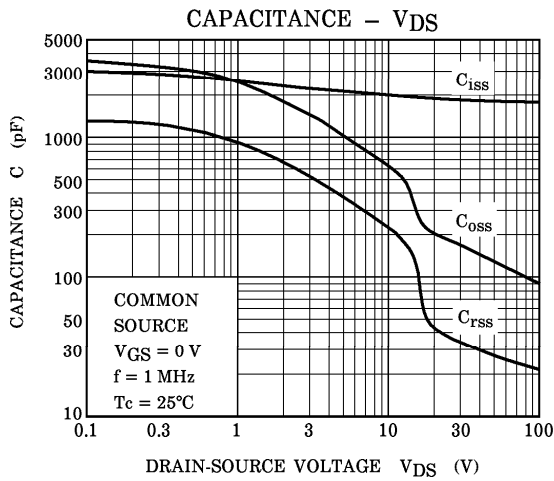
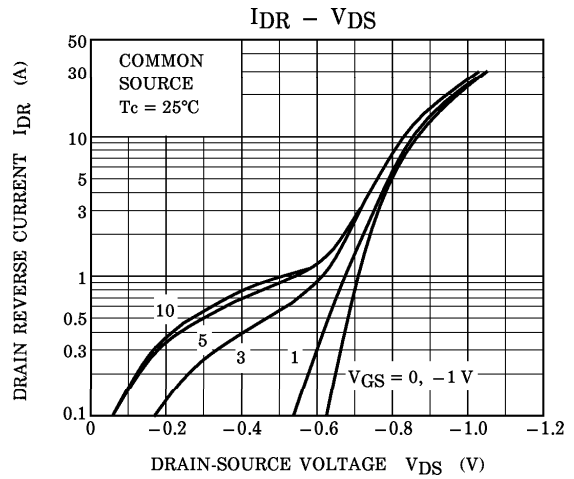
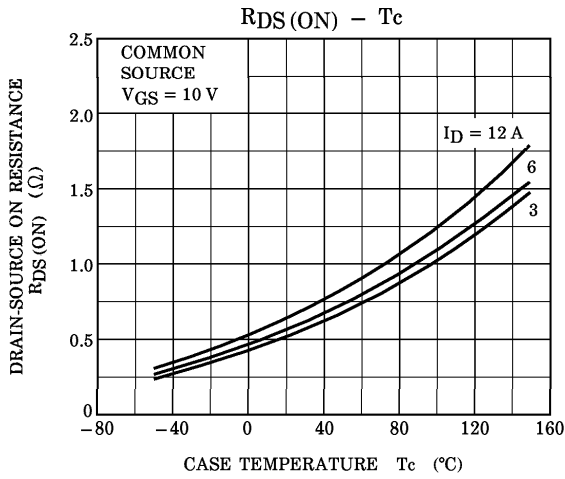
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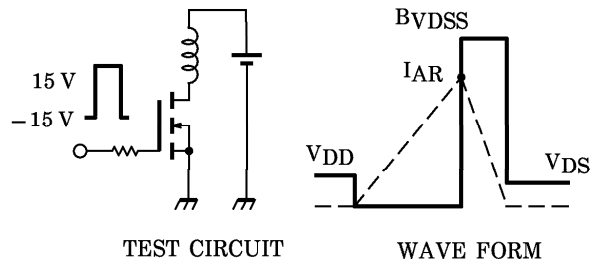
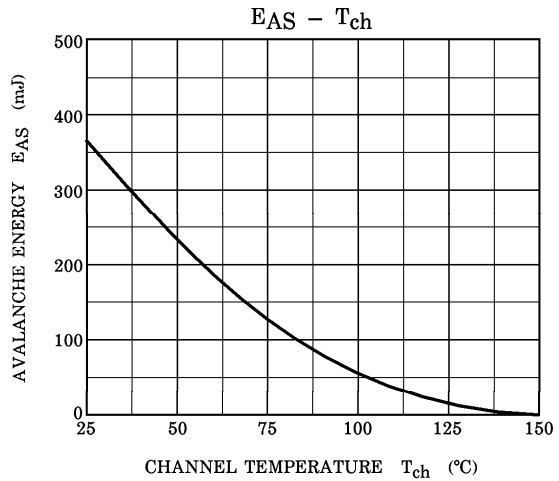
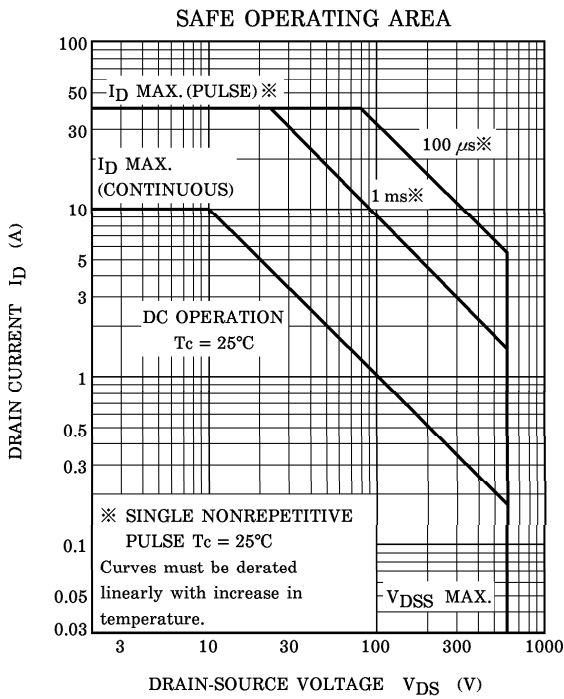
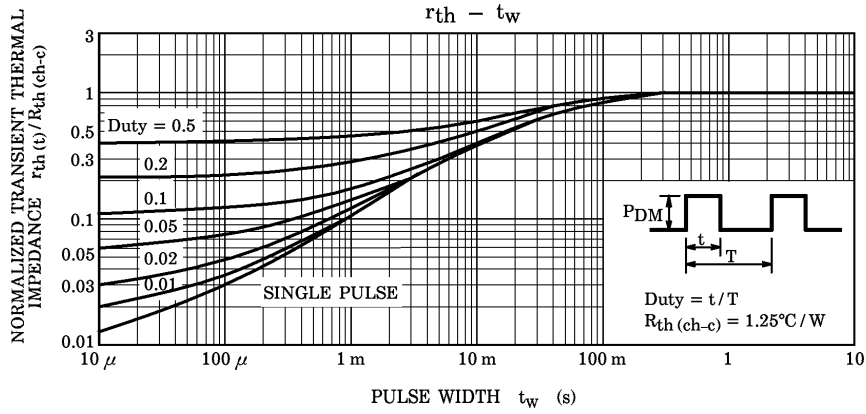
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 10\ \text{A}$, $R_G = 25\ \Omega$
 $V_{DD} = 90\ \text{V}$, $L = 6.36\ \text{mH}$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$