

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

2SK2886

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

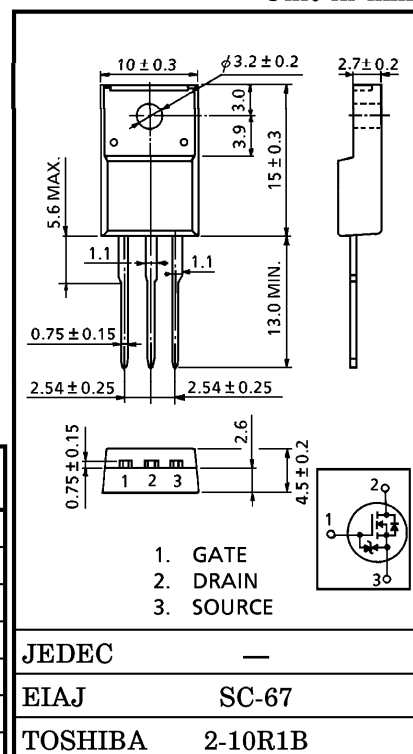
CHOPPER REGULATORS, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 14 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 31 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 50 \text{ V}$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0 \text{ V}$
($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	50	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)	V_{DGR}	50	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	45
	Pulse	I_{DP}	135
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)	P_D	40	W
Single Pulse Avalanche Energy**	E_{AS}	350	mJ
Avalanche Current	I_{AR}	45	A
Repetitive Avalanche Energy*	E_{AR}	4	mJ
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

INDUSTRIAL APPLICATIONS



Weight : 1.9 g (Typ.)

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.125	$^\circ\text{C/W}$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ\text{C/W}$

Note ;

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

** $V_{DD} = 25 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 213 \mu\text{H}$, $R_G = 25 \Omega$, $I_{AR} = 45 \text{ A}$

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

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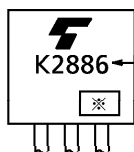
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0 V	—	—	±10	μA	
Drain Cut-off Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V	—	—	100	μA	
Drain-Source Breakdown Voltage	V _{(BR) DSS}	I _D = 10 mA, V _{GS} = 0 V	50	—	—	V	
Gate Threshold Voltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	0.8	—	2.0	V	
Drain-Source ON Resistance	R _{DS (ON)}	V _{GS} = 4 V, I _D = 25 A	—	27	36	mΩ	
	R _{DS (ON)}	V _{GS} = 10 V, I _D = 25 A	—	14	20		
Forward Transfer Admittance	Y _{fs}	V _{DS} = 10 V, I _D = 25 A	18	31	—	S	
Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	2200	—	pF	
Reverse Transfer Capacitance	C _{rss}		—	390	—		
Output Capacitance	C _{oss}		—	1090	—		
Switching Time	Rise Time	t _r		—	40	—	ns
	Turn-on Time	t _{on}		—	70	—	
	Fall Time	t _f		—	130	—	
	Turn-off Time	t _{off}		V _{IN} : t _r , t _f < 5 ns, Duty ≤ 1%, t _w = 10 μs	—	360	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q _g	V _{DD} ≐ 40 V, V _{GS} = 10 V, I _D = 45 A	—	66	—	nC	
Gate-Source Charge	Q _{gs}		—	43	—		
Gate-Drain ("Miller") Charge	Q _{gd}		—	23	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	45	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	135	A
Diode Forward Voltage	V _{DSSF}	I _{DR} = 45 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = 45 A, V _{GS} = 0 V	—	78	—	ns
Reverse Recovery Charge	Q _{rr}		dI _{DR} / dt = 50 A / μs	—	90	—

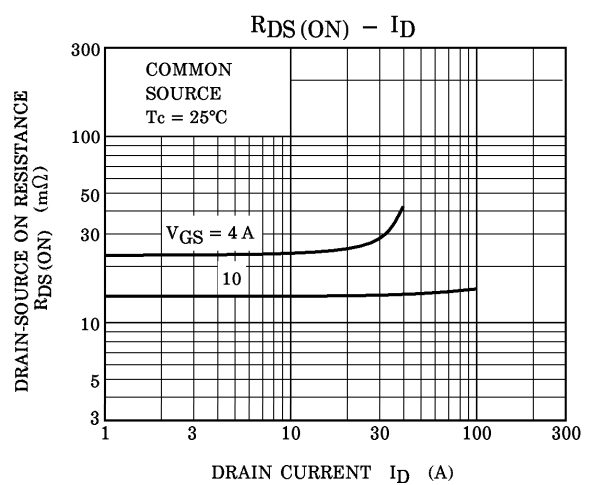
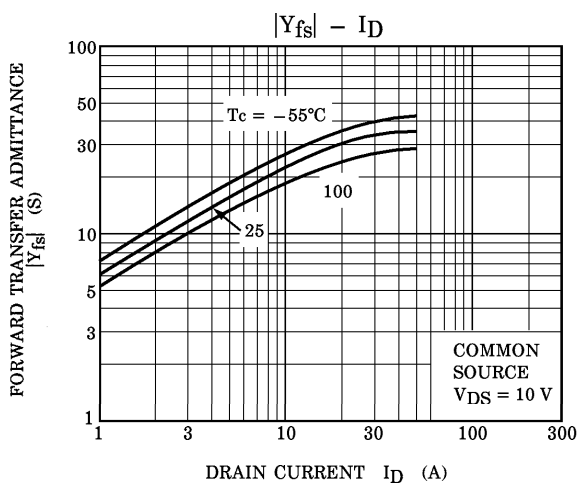
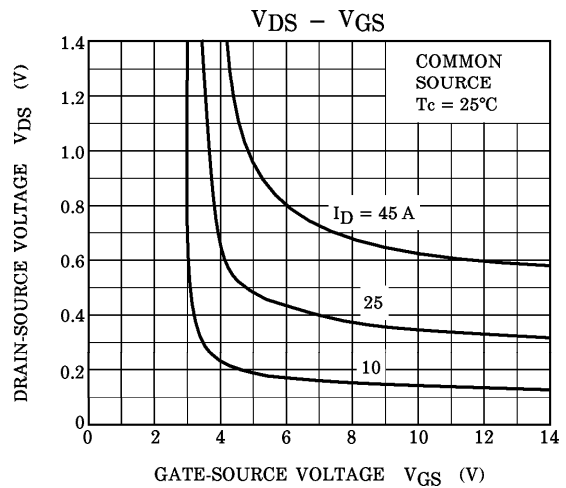
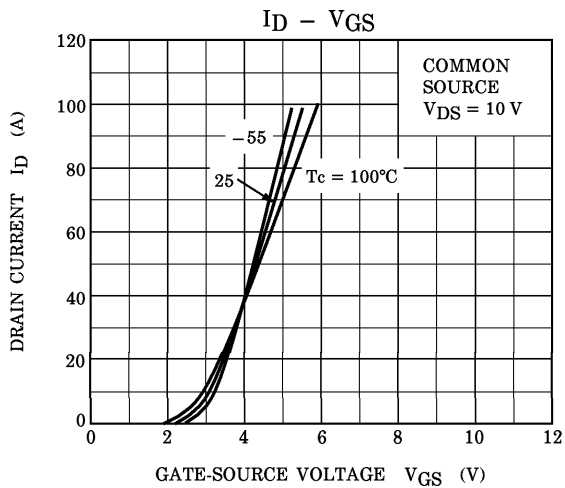
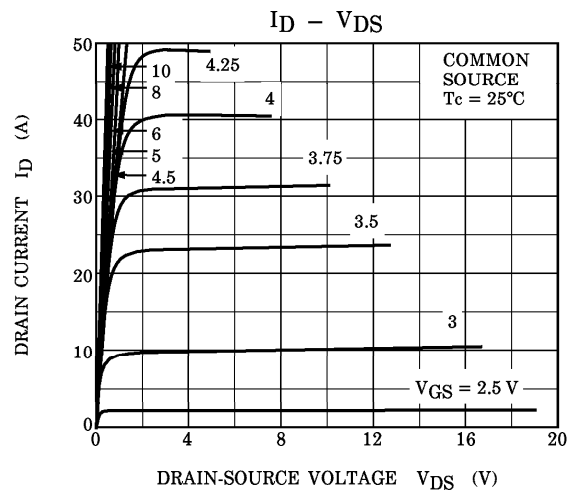
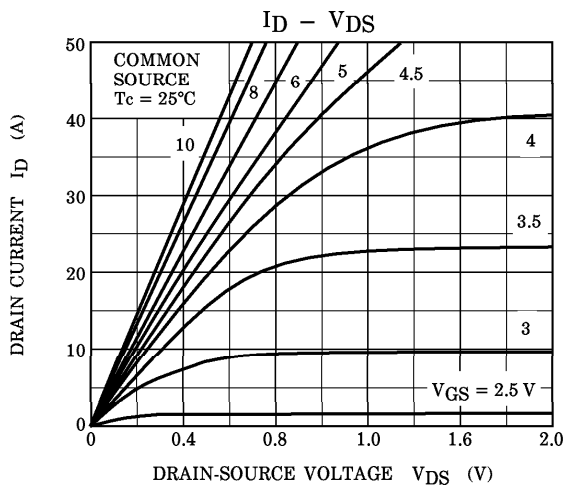
MARKING

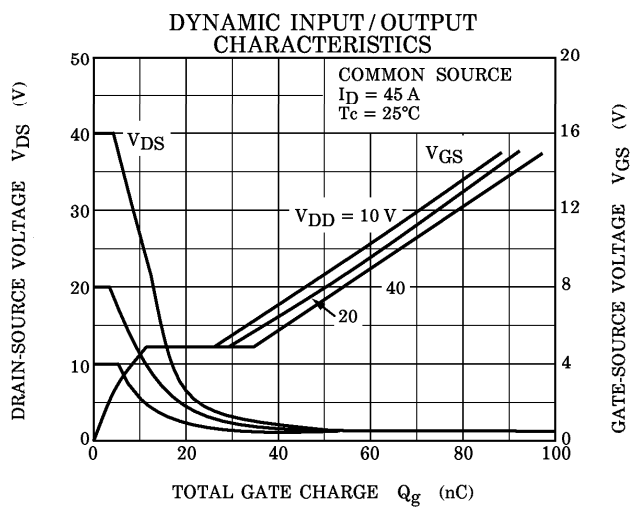
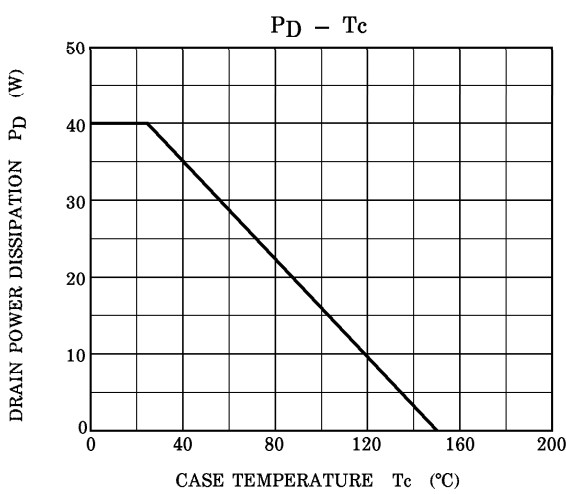
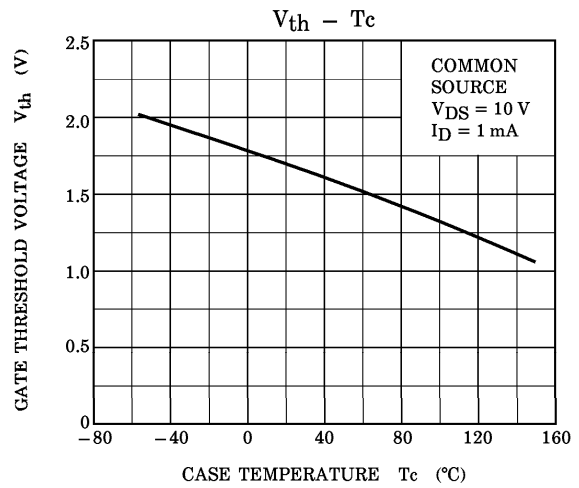
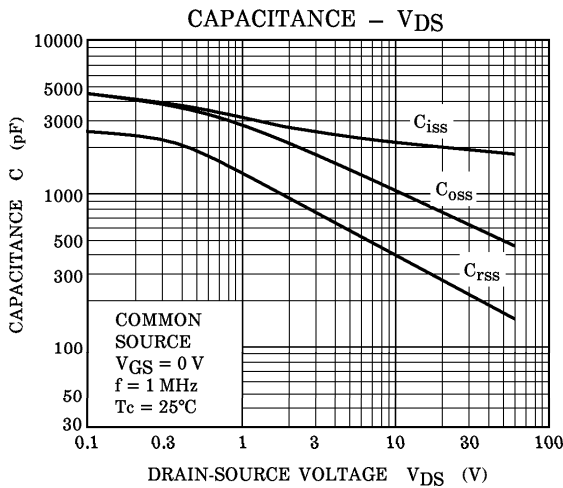
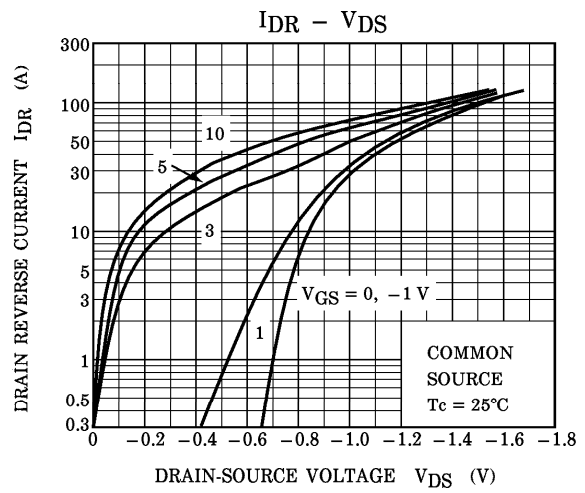
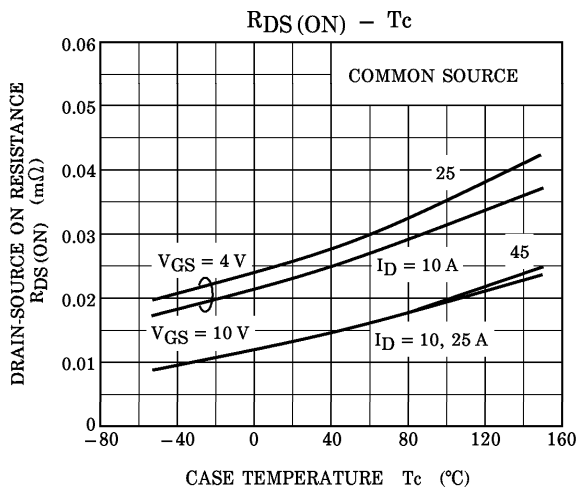


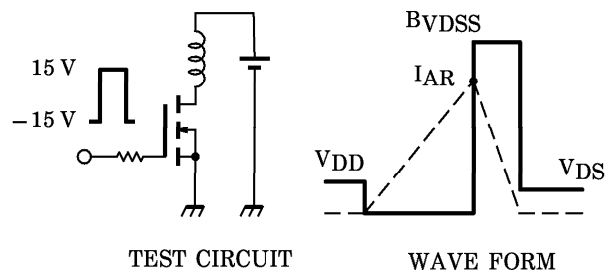
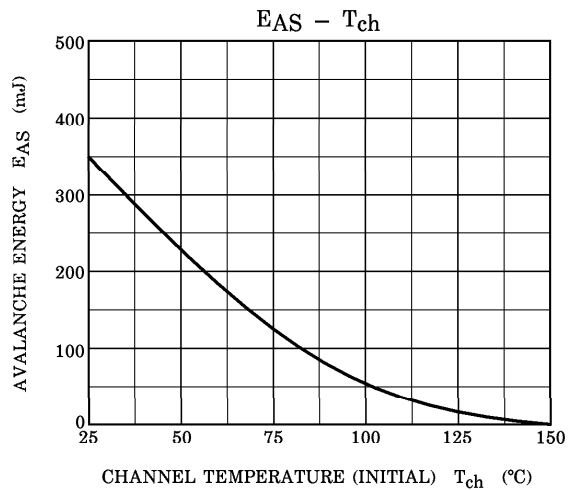
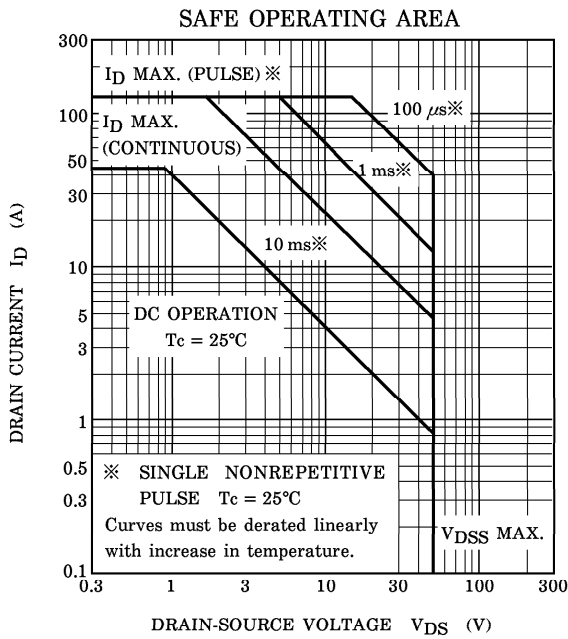
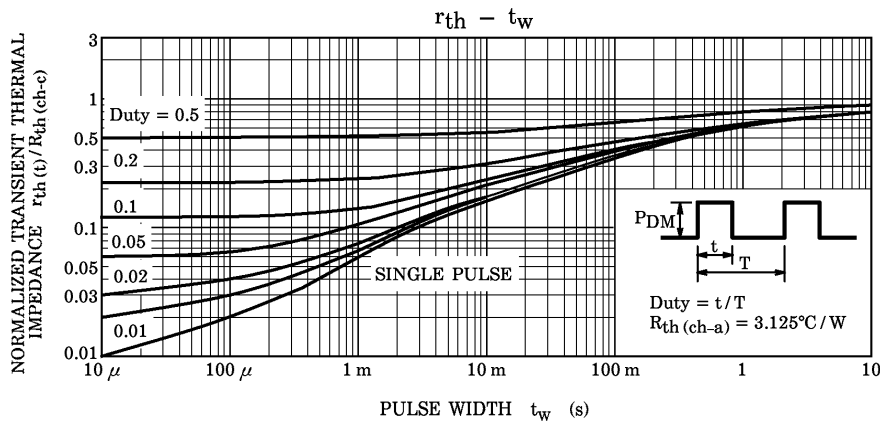
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 45 \text{ A}$, $R_G = 25 \Omega$, $V_{DD} = 25 \text{ V}$, $L = 213 \mu\text{H}$

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