

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-π-MOS V)

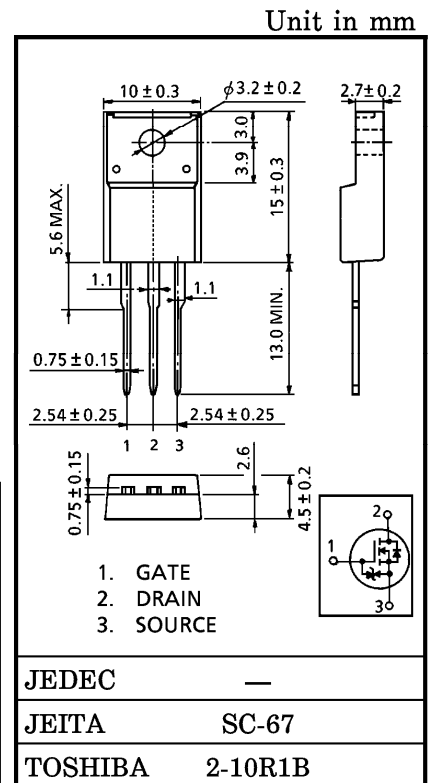
2SK2882

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- 4 V Gate Drive
- Low Drain-Source On Resistance : $R_{DS(ON)} = 0.08 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 17 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 150 V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0 V$
($V_{DS} = 10 V, I_D = 1 mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	150	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)		V_{DGR}	150	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC (Note 1)	I_D	18	A
	Pulse (Note 1)	I_{DP}	54	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	45	W
Single Pulse Avalanche Energy (Note 2)		E_{AS}	176	mJ
Avalanche Current		I_{AR}	18	A
Repetitive Avalanche Energy (Note 3)		E_{AR}	4.5	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$



Weight : 1.9 g (Typ.)

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	2.78	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C / W$

(Note 1) : Please use devices on condition that the channel temperature is below 150°C.
 (Note 2) : $V_{DD} = 50 V, T_{ch} = 25^\circ C$ (initial), $L = 0.8 mH, R_G = 25 \Omega, I_{AR} = 18 A$
 (Note 3) : Repetitive rating ; Pulse Width Limited by maximum junction temperature.

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

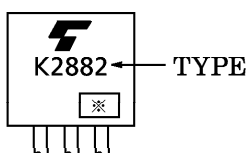
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 150\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	150	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4\text{ V}, I_D = 9\text{ A}$	—	0.09	0.18	Ω
			$V_{GS} = 10\text{ V}, I_D = 9\text{ A}$	—	0.08	0.12	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 9\text{ A}$	10	17	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	1380	—	pF
Reverse Transfer Capacitance		C_{rss}		—	200	—	
Output Capacitance		C_{oss}		—	610	—	
Switching Time	Rise Time	t_r		—	12	—	ns
	Turn-on Time	t_{on}		—	24	—	
	Fall Time	t_f		—	56	—	
	Turn-off Time	t_{off}		Duty $\leq 1\%$, $t_w = 10\ \mu\text{s}$	—	130	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \approx 120\text{ V}, V_{GS} = 10\text{ V}, I_D = 18\text{ A}$	—	57	—	nC
Gate-Source Charge		Q_{gs}		—	43	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	14	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current (Note 1)	I_{DR}	—	—	—	18	A
Pulse Drain Reverse Current (Note 1)	I_{DRP}	—	—	—	54	A
Forward Voltage (Diode)	V_{DSF}	$I_{DR} = 18\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 18\text{ A}, V_{GS} = 0\text{ V}$	—	185	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	1.3	—	μC

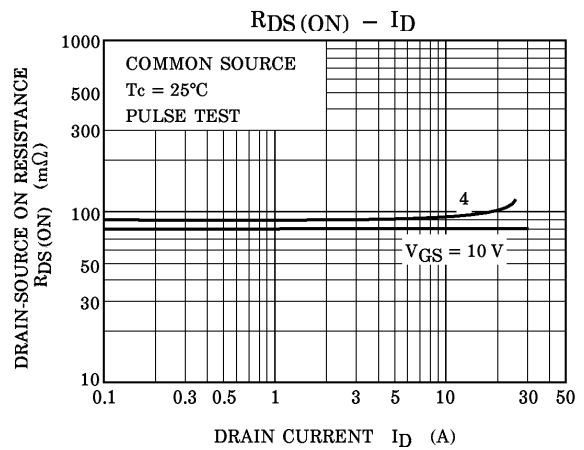
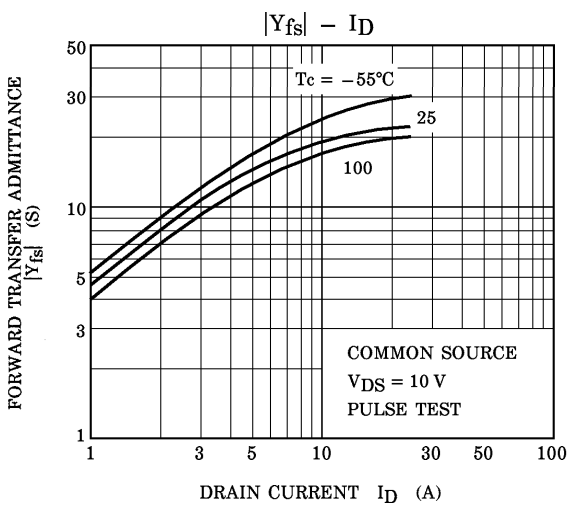
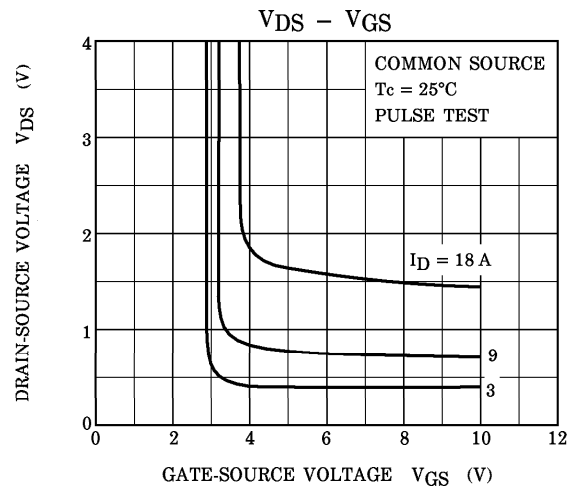
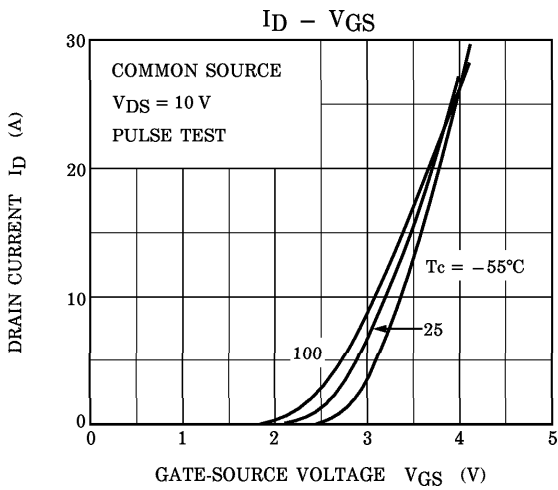
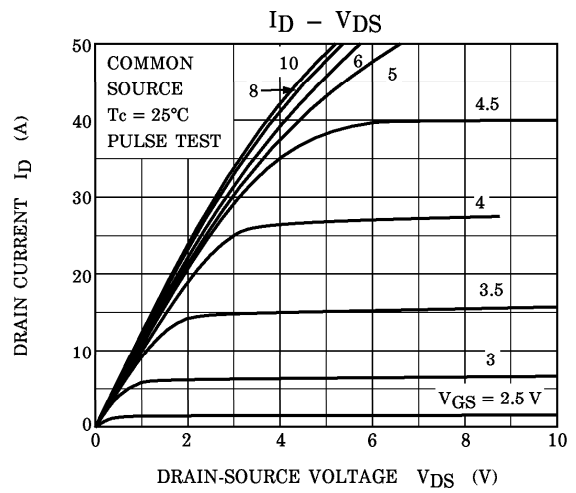
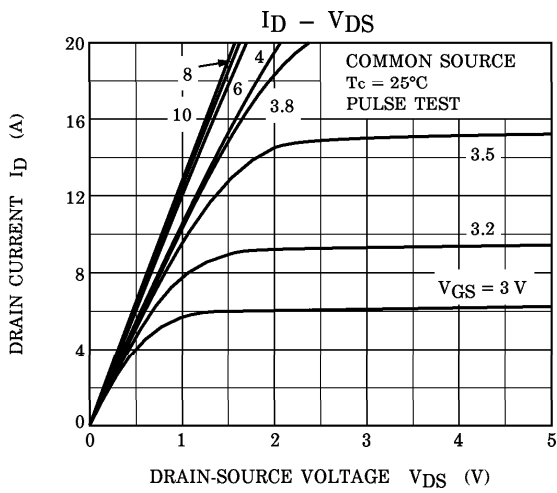
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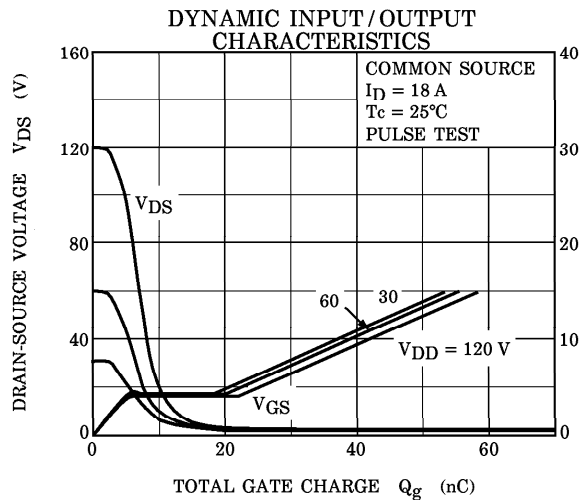
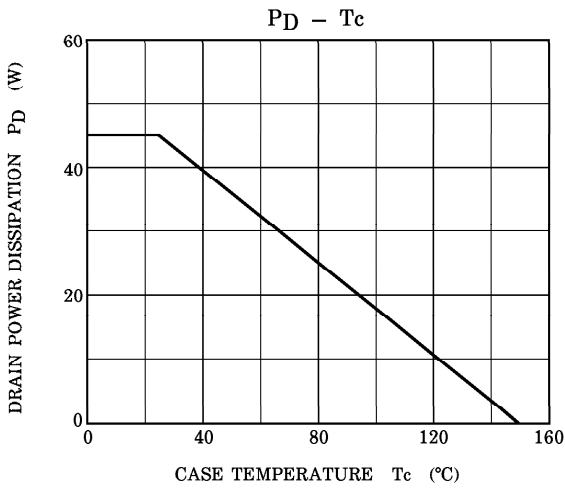
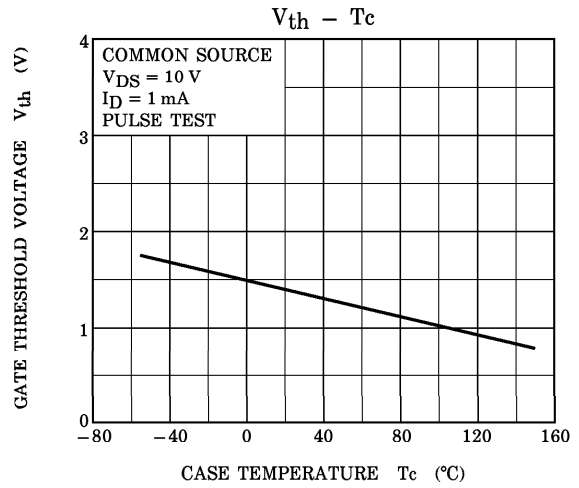
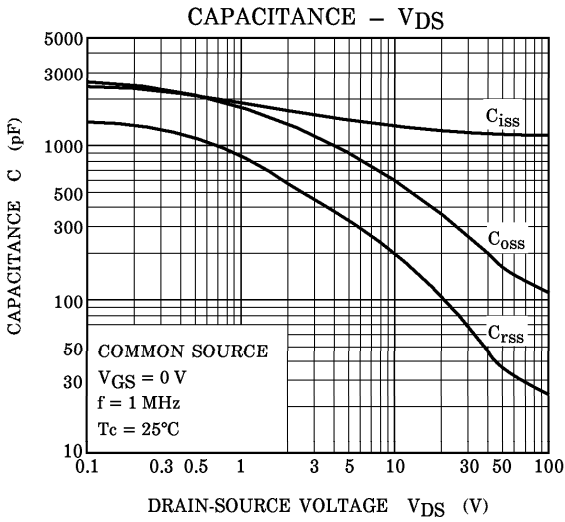
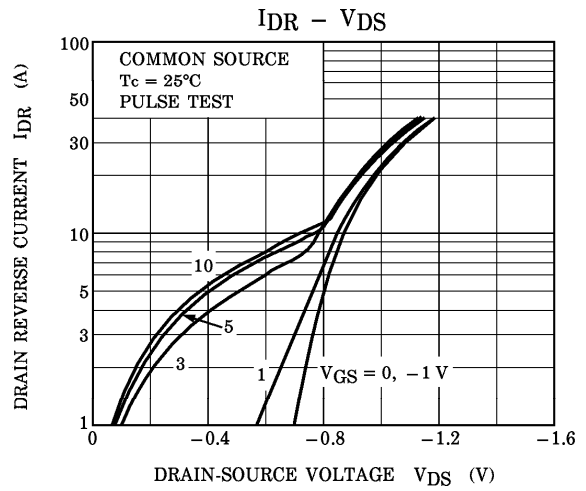
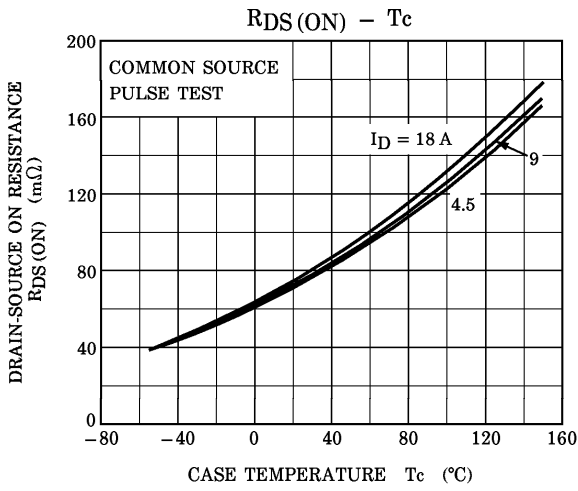


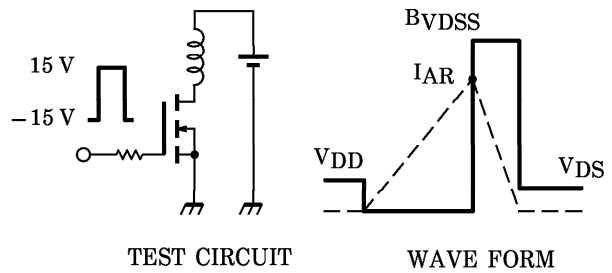
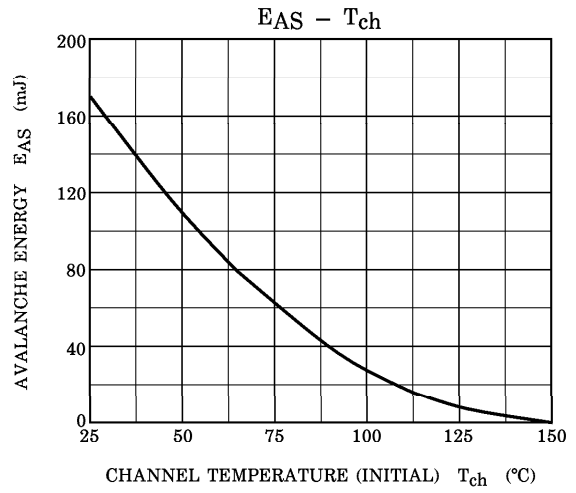
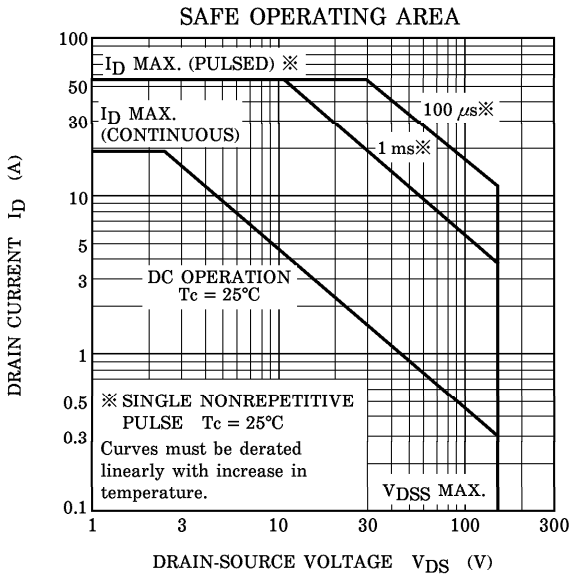
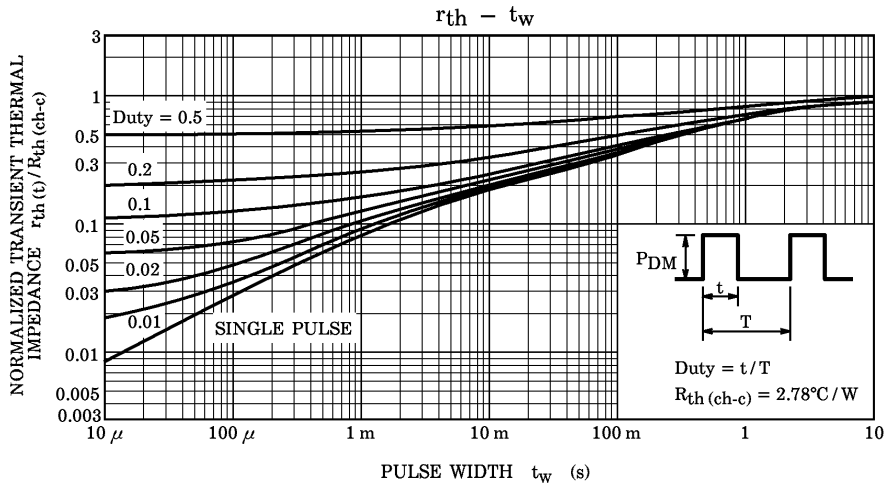
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







$$R_G = 25 \Omega$$

$$V_{DD} = 50 \text{ V}, L = 0.8 \text{ mH} \quad E_{AS} = \frac{1}{2} \cdot L \cdot I_{AR}^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$

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