

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

2SK2782

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.039\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 11S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 60V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0V$ ($V_{DS} = 10V, I_D = 1mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	20 A
	Pulse	I_{DP}	50 A
Drain Power Dissipation (Tc = 25°C)	P_D	40	W
Single Pulse Avalanche Energy**	E_{AS}	156	mJ
Avalanche Current	I_{AR}	20	A
Repetitive Avalanche Energy*	E_{AR}	4	mJ
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.125	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	°C/W

Note ;

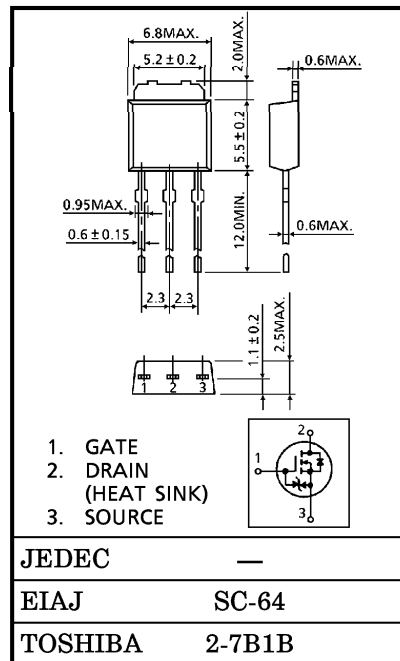
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = 25V$, Starting $T_{ch} = 25^\circ C$, $L = 530\mu H$, $R_G = 25\Omega$, $I_D = 20A$

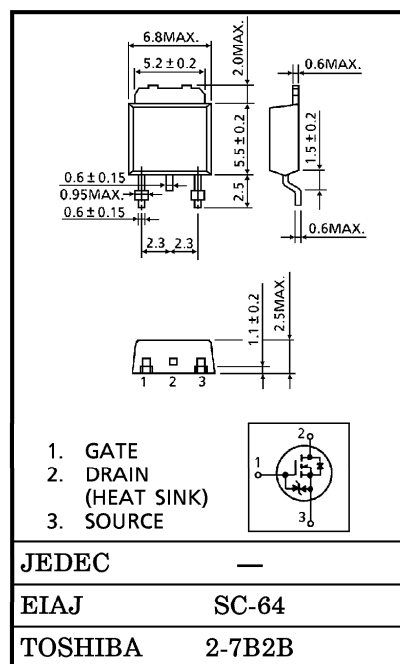
This transistor is an electrostatic sensitive device. Please handle with caution.

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 0.36g



Weight : 0.36g

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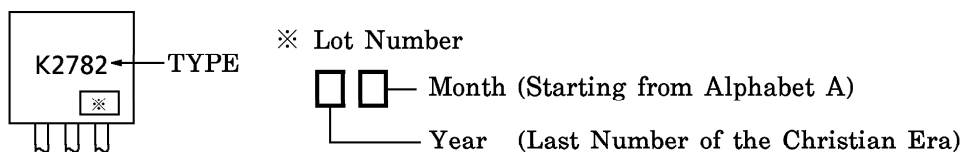
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

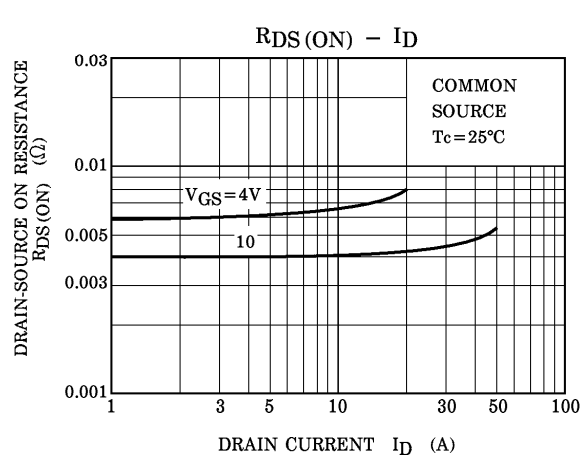
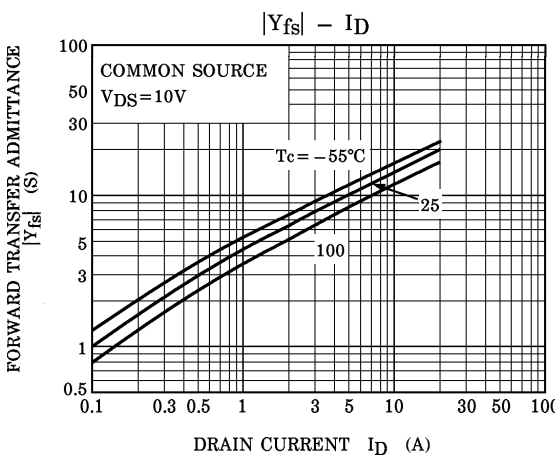
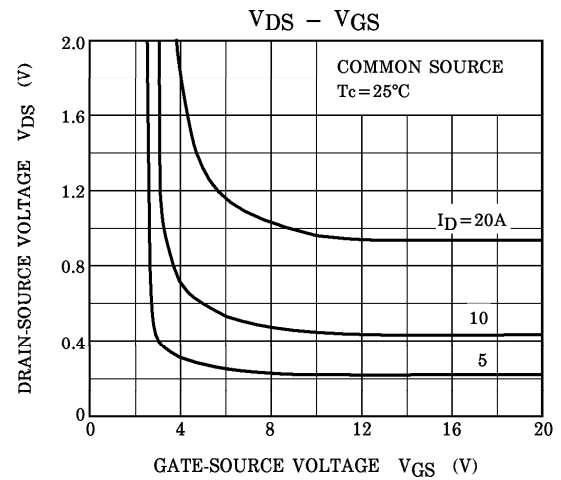
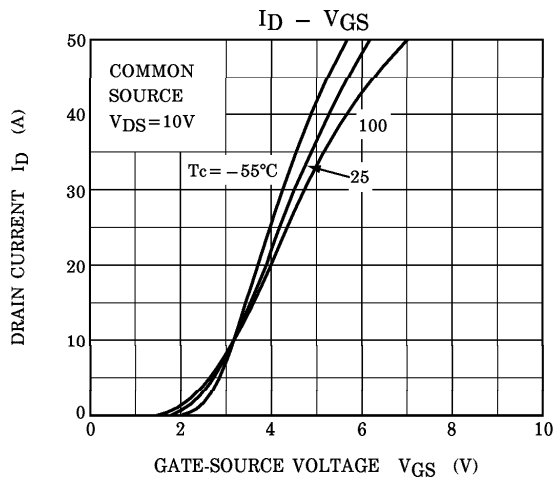
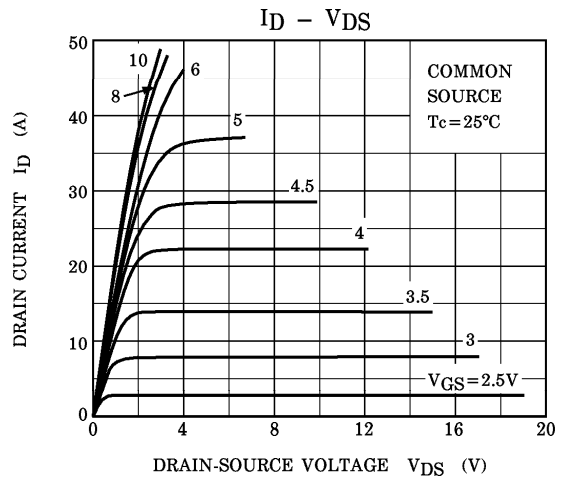
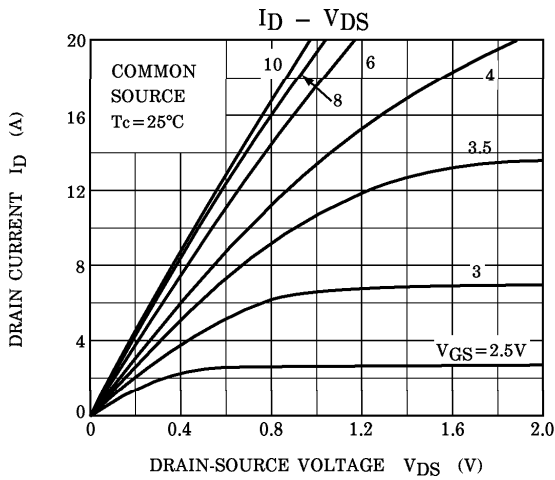
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 60V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	60	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 4V, ID = 5A	—	0.06	0.09	Ω
			VGS = 10V, ID = 10A	—	0.039	0.055	
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 10A	7	11	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	880	—	pF
Reverse Transfer Capacitance		Crss		—	90	—	
Output Capacitance		Coss		—	330	—	
Switching Time	Rise Time	tr	<p>VGS 10V 0V, ID = 10A, VDD ≐ 30V, RL = 3.0Ω</p> <p>VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs</p>	—	15	—	ns
	Turn-on Time	ton		—	25	—	
	Fall Time	tf		—	30	—	
	Turn-off Time	toff		—	100	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 48V, VGS = 10V, ID = 20A	—	25	—	nC
Gate-Source Charge		Qgs		—	19	—	
Gate-Drain ("Miller") Charge		Qgd		—	6	—	

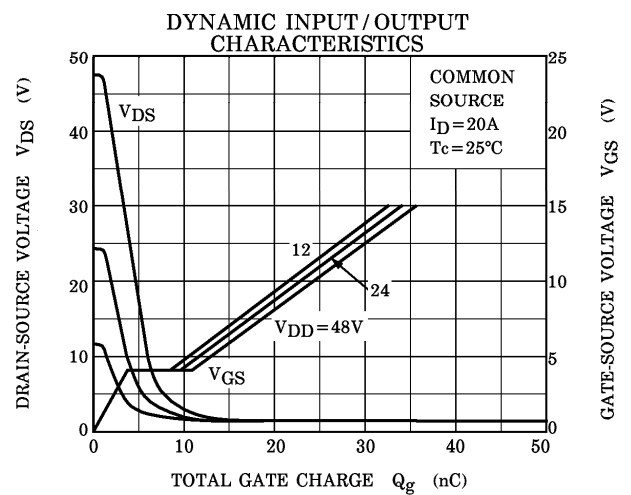
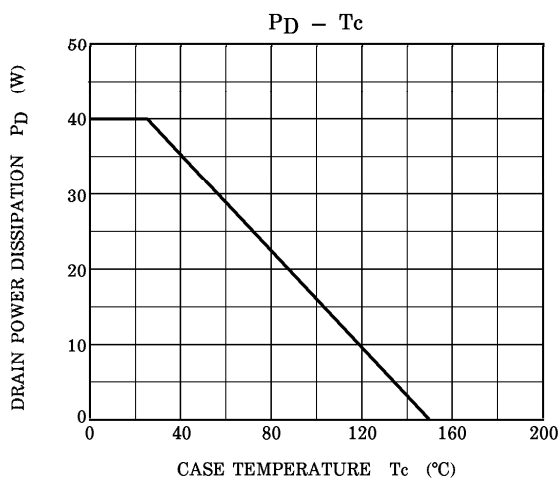
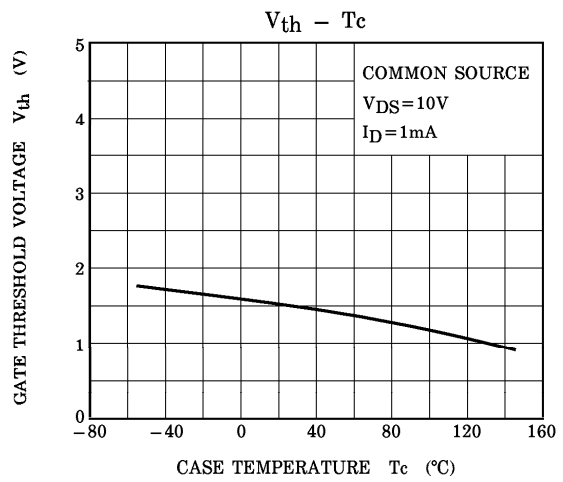
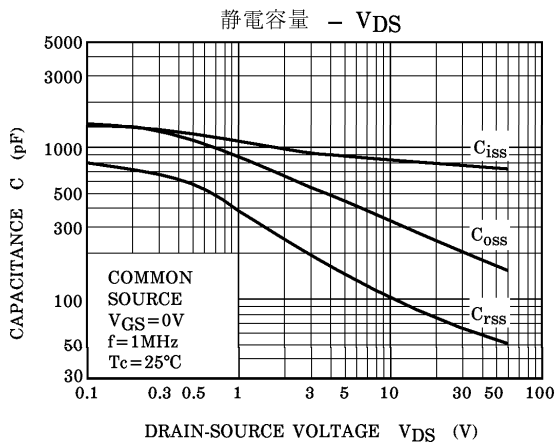
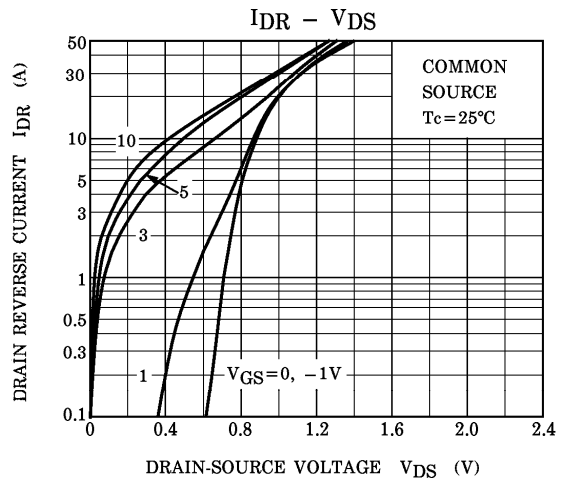
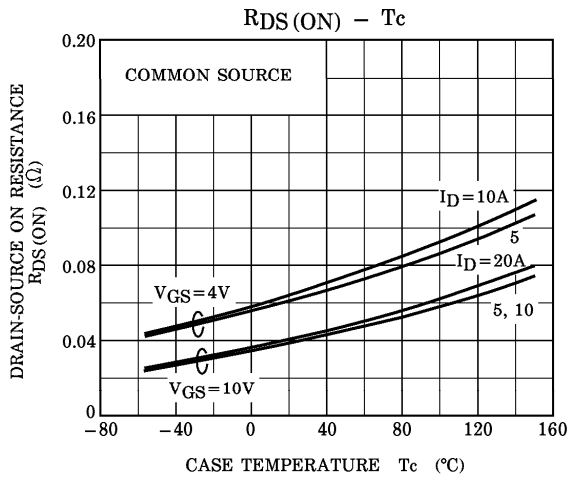
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

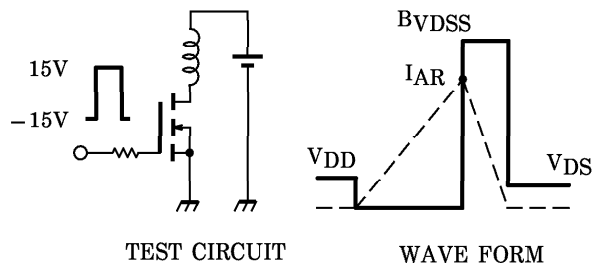
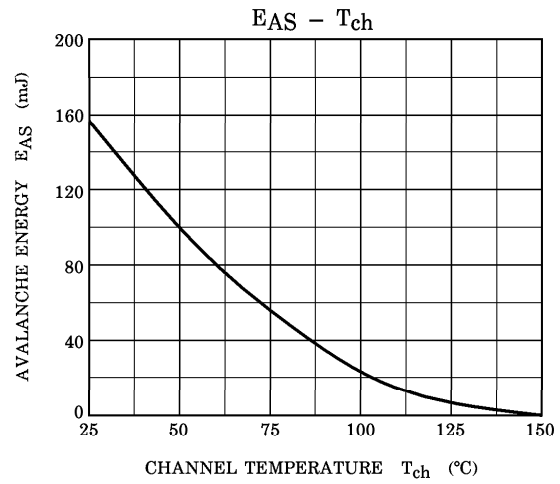
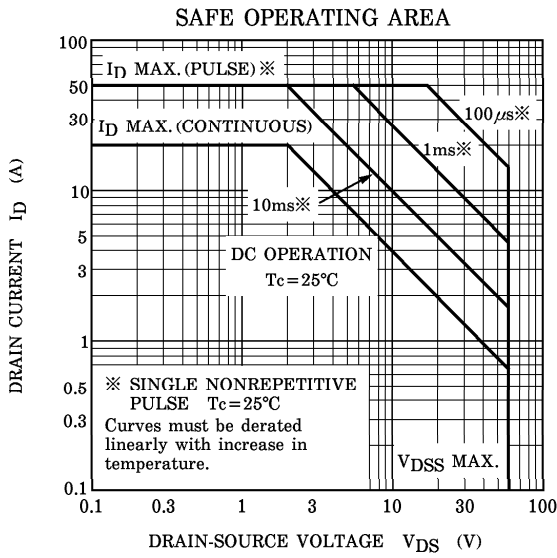
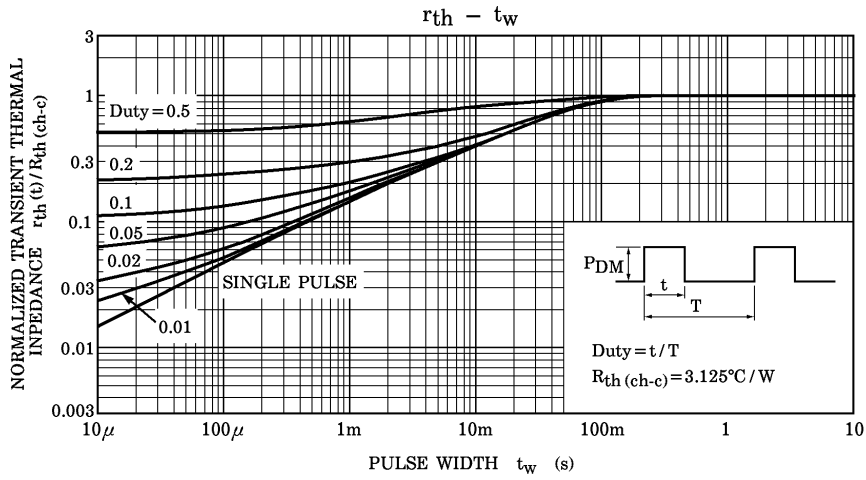
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	20	A
Pulse Drain Reverse Current	IDRP	—	—	—	50	A
Diode Forward Voltage	VDSF	IDR = 20A, VGS = 0V	—	—	-2.0	V
Reverse Recovery Time	trr	IDR = 20A, VGS = 0V	—	60	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50A / μs	—	45	—	μC

MARKING









Peak $I_{AR} = 20A$, $R_G = 25\Omega$
 $V_{DD} = 25V$, $L = 530\mu H$

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