

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

2SK2745

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 7.0m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 50S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 50V$)
- 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}	50	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	50	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	50 A
	Pulse	I_{DP}	200 A
Drain Power Dissipation (Tc = 25°C)	P_D	150	W
Single Pulse Avalanche Energy**	E_{AS}	747	mJ
Avalanche Current	I_{AR}	50	A
Repetitive Avalanche Energy*	E_{AR}	15	mJ
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C

HERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	°C/W

Note ;

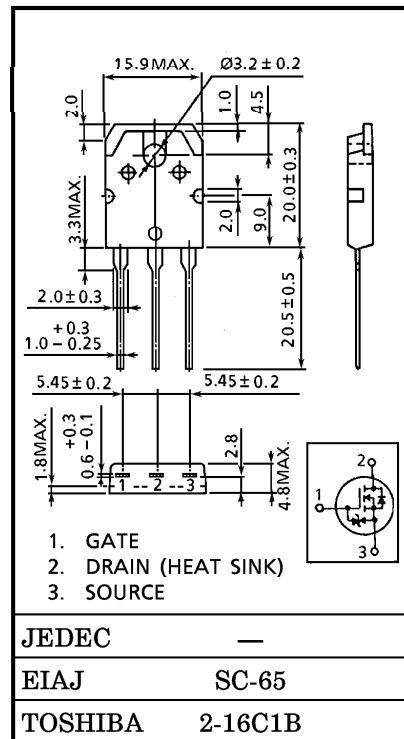
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = 25V$, Starting $T_{ch} = 25^\circ C$, $L = 368\mu H$, $R_G = 25\Omega$, $I_{AR} = 50A$

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

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 4.6g

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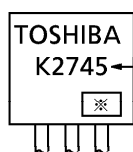
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 50V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	50	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 4V, ID = 25A	—	11	16	mΩ
			VGS = 10V, ID = 25A	—	7	9.5	
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 25A	30	50	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	4000	—	pF
Reverse Transfer Capacitance		Crss		—	800	—	
Output Capacitance		Coss		—	2000	—	
Switching Time	Rise Time	tr	<p> $I_D = 25A$ $V_{GS} = 10V$ $V_{DS} = 0V$ $R_L = 1.0\Omega$ $V_{DD} = 25V$ </p>	—	25	—	ns
	Turn-on Time	ton		—	40	—	
	Fall Time	tf		—	120	—	
	Turn-off Time	toff		$V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$	—	360	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = 40V, VGS = 10V	—	130	—	nC
Gate-Source Charge		Qgs	ID = 50A	—	90	—	
Gate-Drain ("Miller") Charge		Qgd		—	40	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	50	A
Pulse Drain Reverse Current	IDRP	—	—	—	200	A
Diode Forward Voltage	VDSF	IDR = 50A, VGS = 0V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	IDR = 50A, VGS = 0V	—	140	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 50A / μs	—	80	—	nC

MARKING

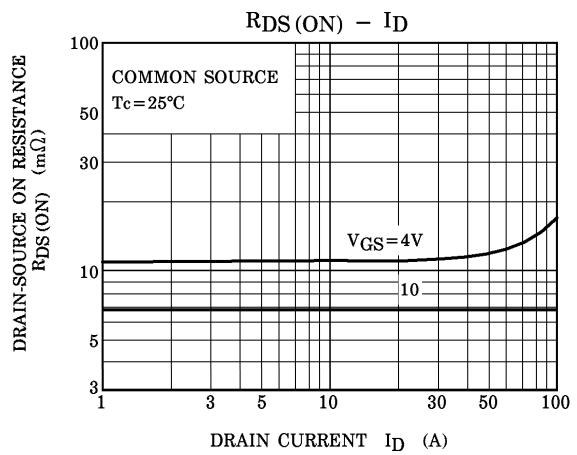
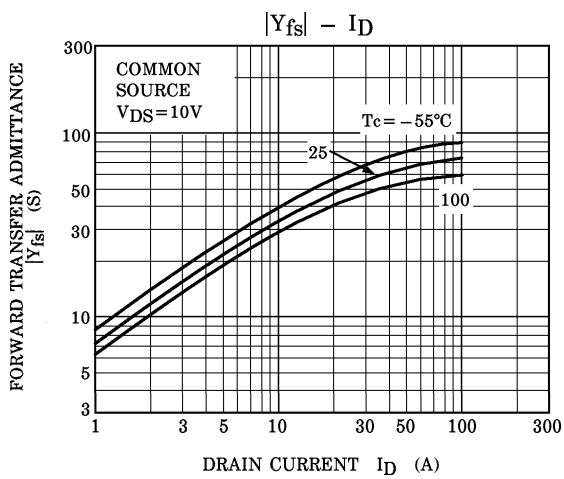
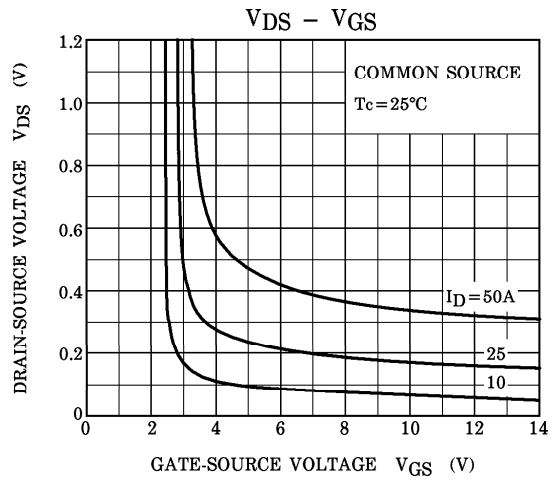
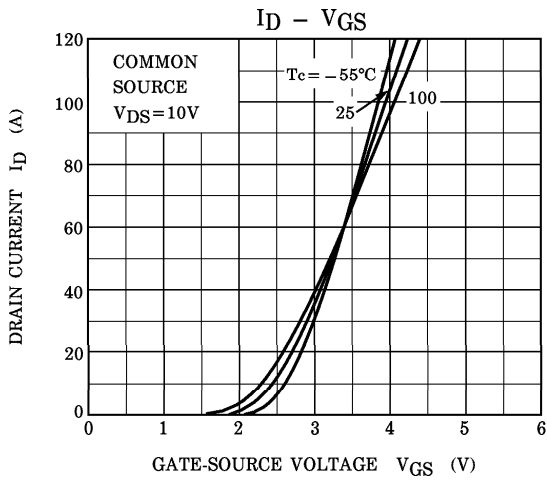
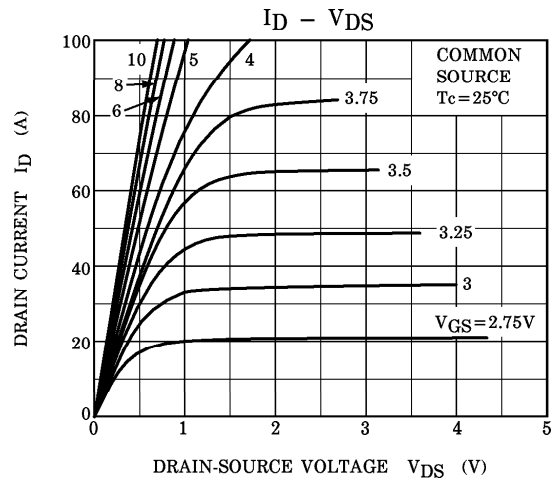
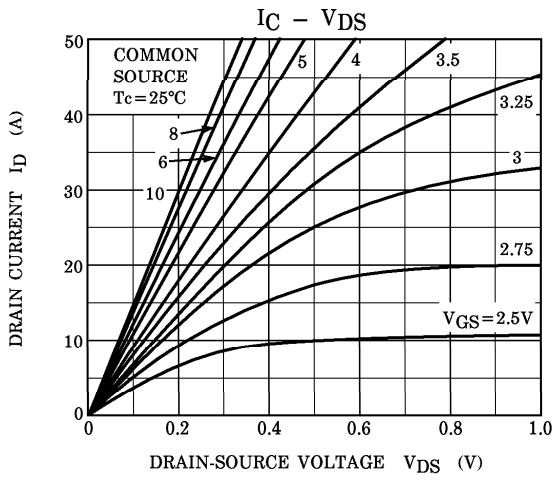


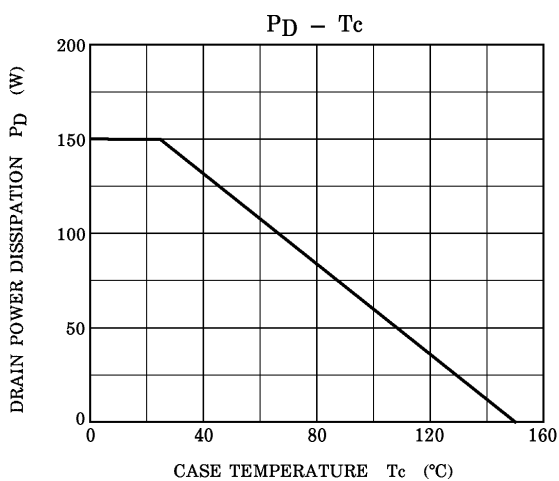
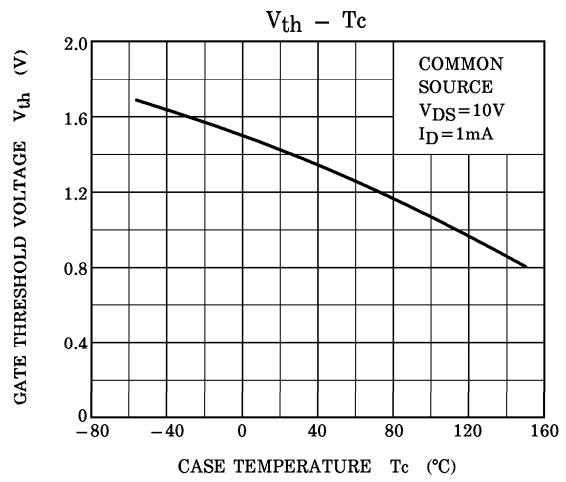
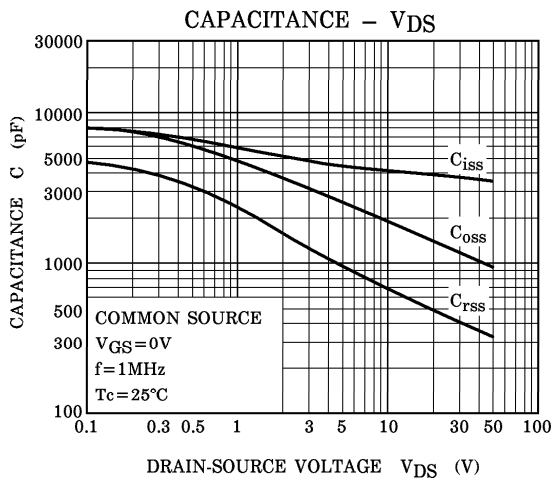
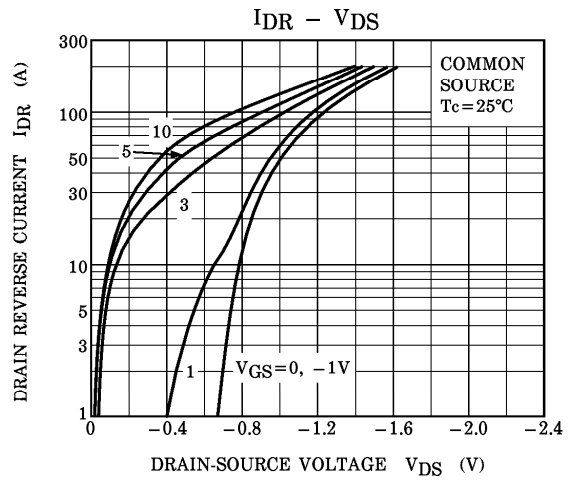
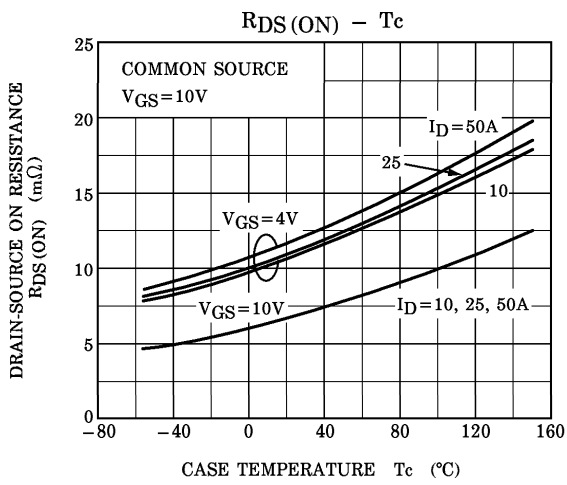
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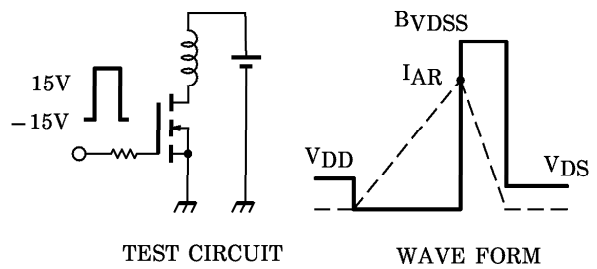
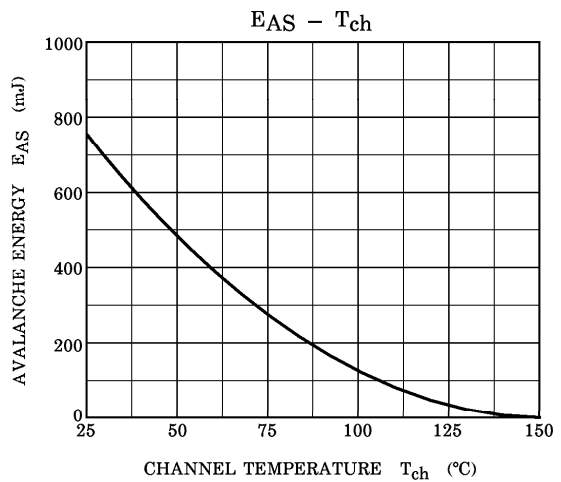
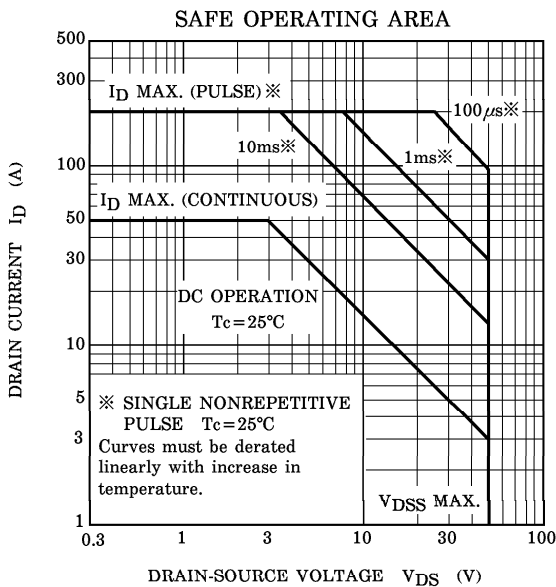
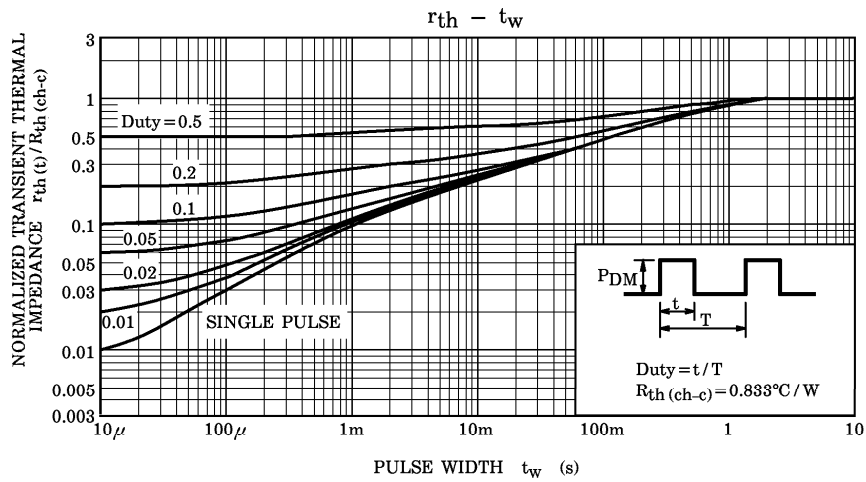
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 50A$, $R_G = 25\Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = 25V$, $L = 368\mu H$