

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

2SK2698

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

DC-DC CONVERTER, RELAY DRIVE AND MOTOR DRIVE APPLICATIONS

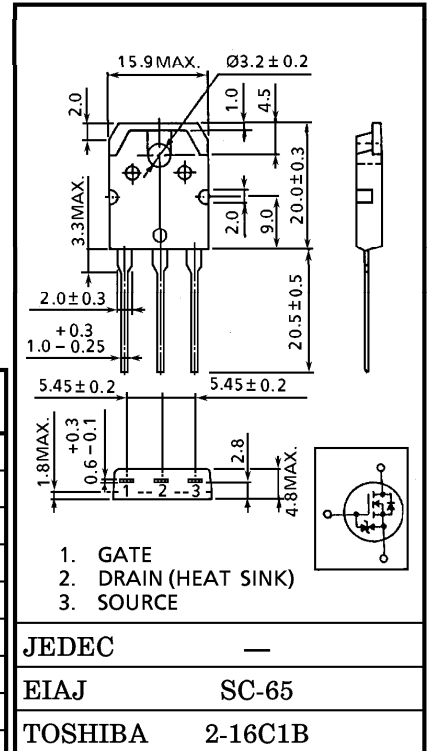
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.35 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 11 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 500 \text{ V}$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0 \text{ V}$
($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	500	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	15	A
	Pulse	I_{DP}	60	A
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)		P_D	150	W
Single Pulse Avalanche Energy**		E_{AS}	630	mJ
Avalanche Current		I_{AR}	15	A
Repetitive Avalanche Energy*		E_{AR}	15	mJ
Channel Temperature		T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ\text{C}$



Weight : 4.6 g

THERMAL CHARACTERISTICS

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

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 90 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 4.76 \text{ mH}$, $R_G = 25 \Omega$, $I_{AR} = 15 \text{ A}$

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

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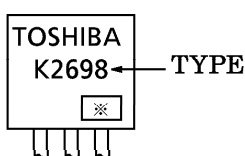
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I _{GSS}	V _{GS} = ±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} = 500 V, V _{GS} = 0 V	—	—	100	μA	
Drain-Source Breakdown Voltage	V _{(BR)DSS}	I _D = 10 mA, V _{GS} = 0 V	500	—	—	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 = 7.0 A	—	0.35	0.4	Ω	
Forward Transfer Admittance	Y _{fs}	V _{DS} = 10 V, I _D = 7.0 A	6	11	—	S	
Input Capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	2600	—	pF	
Reverse Transfer Capacitance	C _{rss}		—	280	—		
Output Capacitance	C _{oss}		—	880	—		
Switching Time	Rise Time	t _r	<p>V_{GS} 10 V 0 V 50 Ω I_D = 7 A R_L = 30 Ω V_{OUT} V_{DD} ≅ 210 V</p>	—	50	—	ns
	Turn-on Time	t _{on}		—	85	—	
	Fall Time	t _f		—	65	—	
	Turn-off Time	t _{off}		—	260	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q _g	V _{DD} ≅ 400 V, V _{GS} = 10 V, I _D = 15 A	—	58	—	nC	
Gate-Source Charge	Q _{gs}		—	36	—		
Gate-Drain ("Miller") Charge	Q _{gd}		—	22	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	15	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	60	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 15 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = 15 A, V _{GS} = 0 V dI _{DR} / dt = 100 A / μs	—	400	—	ns
Reverse Recovery Charge	Q _{rr}		—	4.3	—	μC

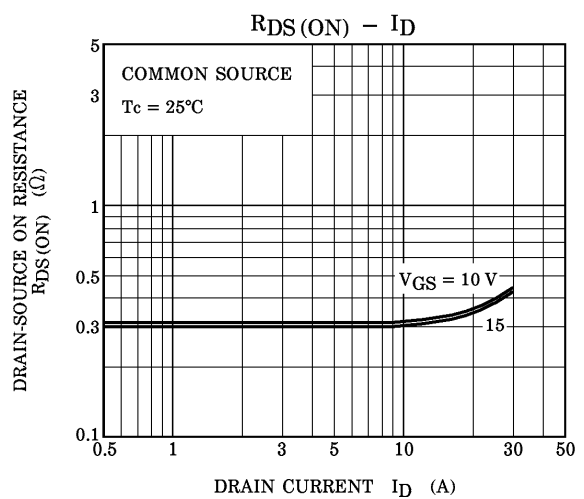
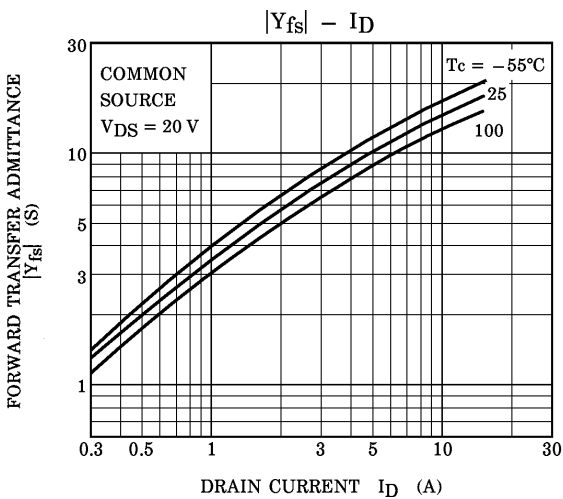
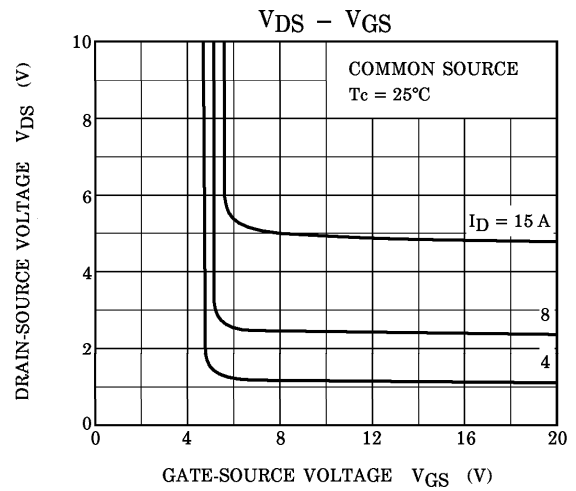
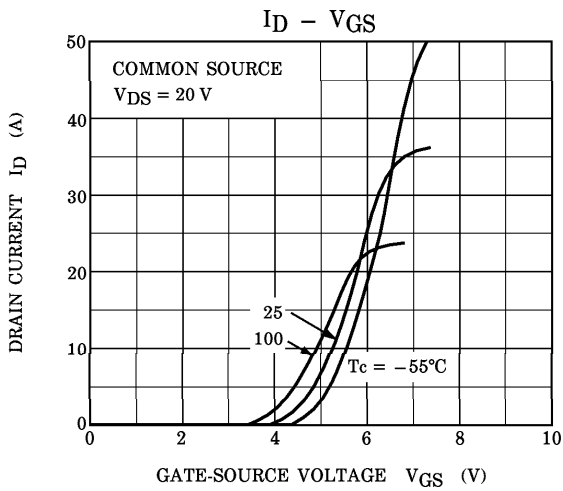
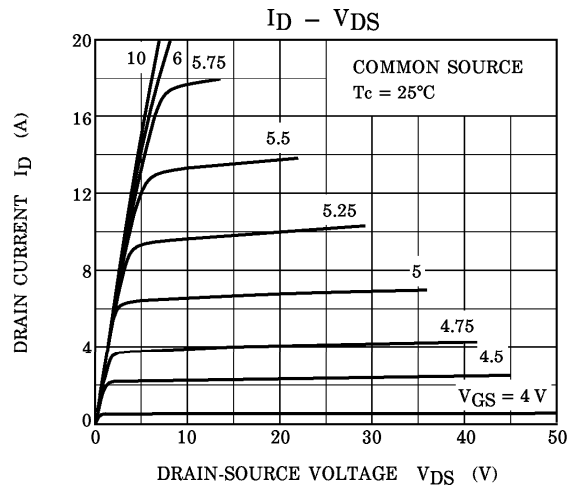
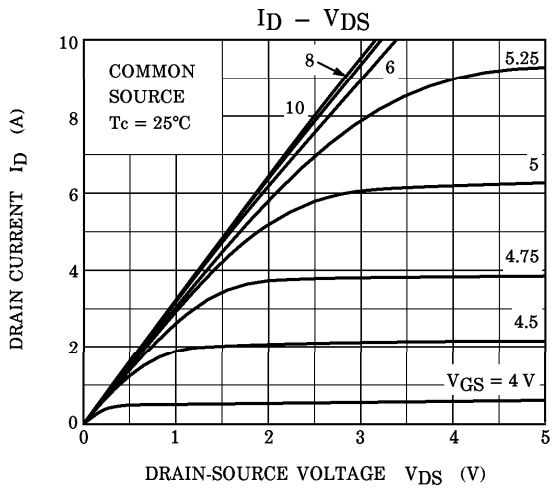
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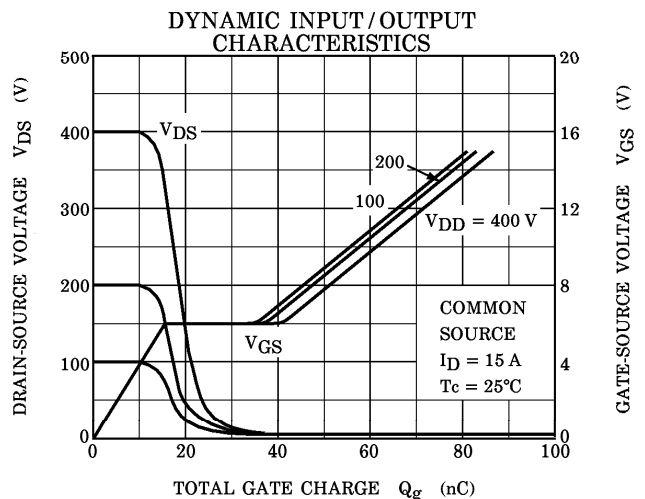
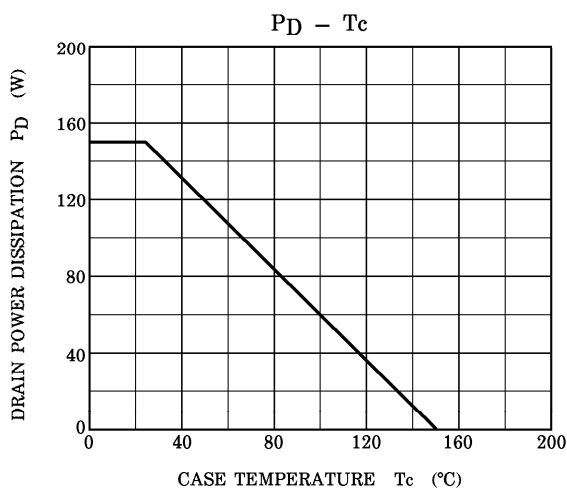
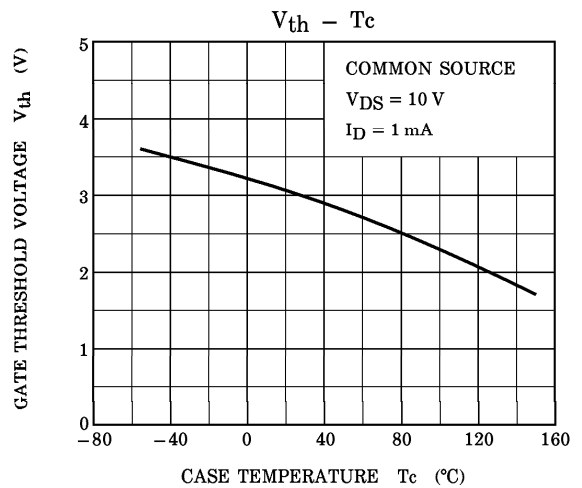
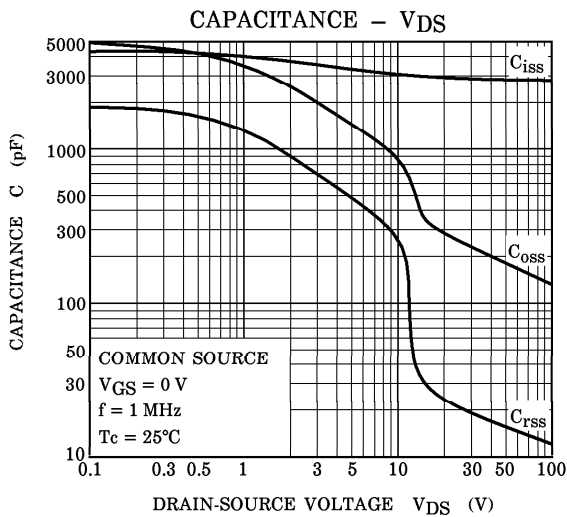
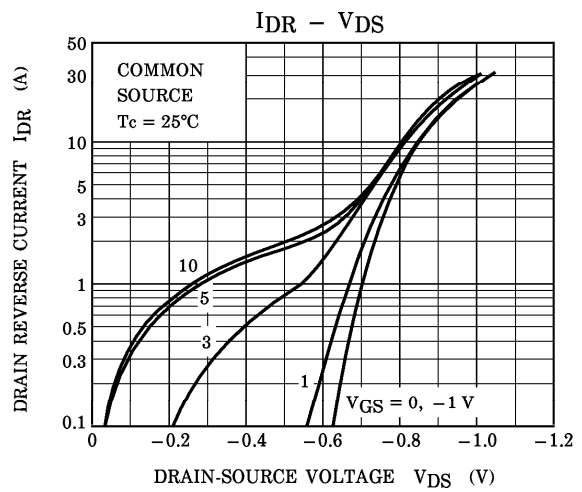
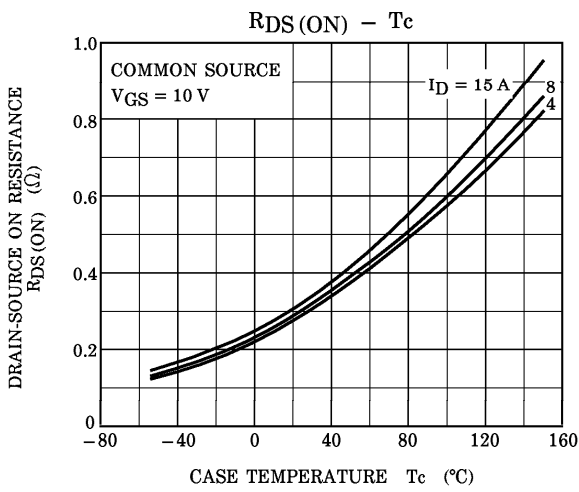


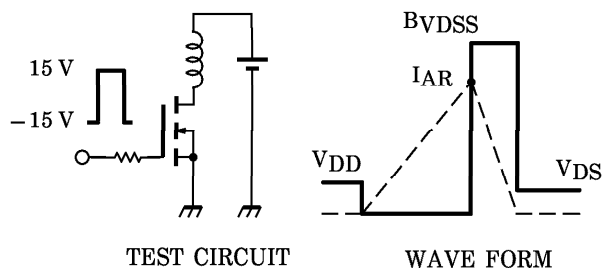
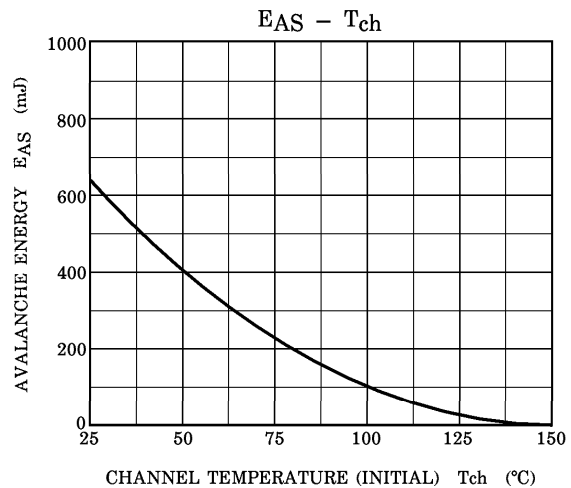
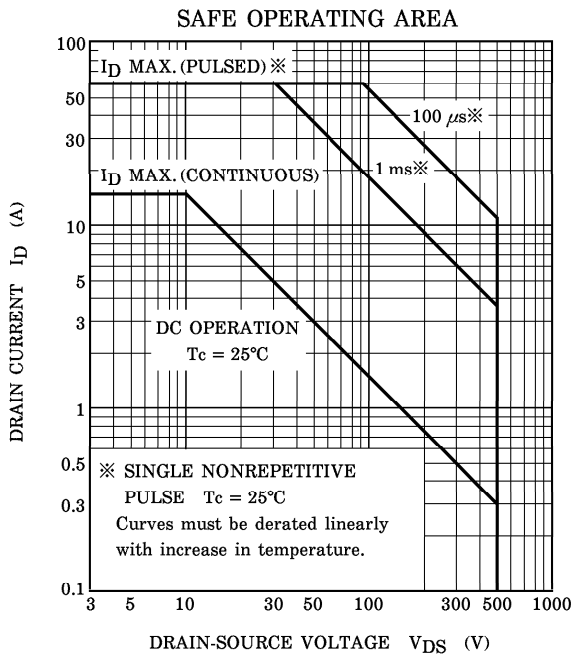
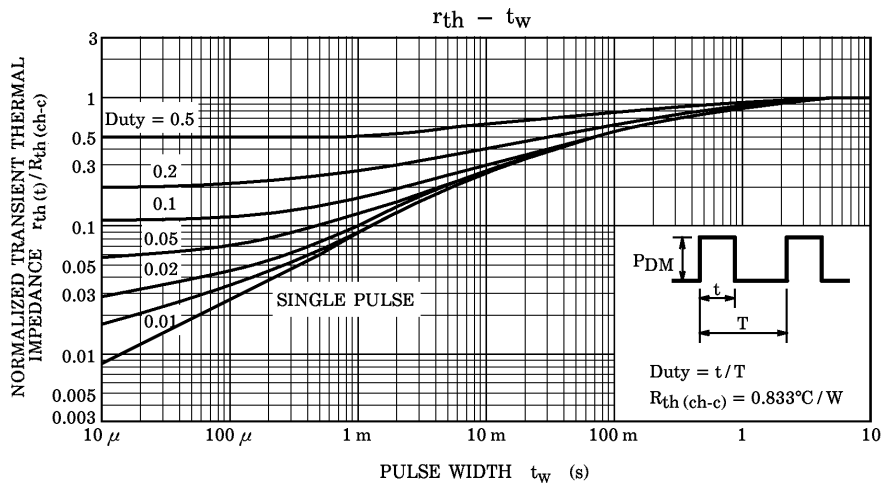
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 15 \text{ A}$, $R_G = 25 \Omega$
 $V_{DD} = 90 \text{ V}$, $L = 4.76 \text{ mH}$

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