

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

2SK2381

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

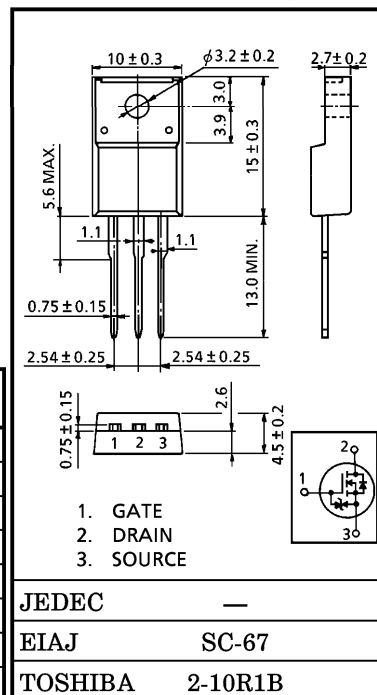
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.56\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.5S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 200V$)
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.5V$ ($V_{DS} = 10V, I_D = 1mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	200	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	5	A
	Pulse	I_{DP}	20	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	25	W
Single Pulse Avalanche Energy**		E_{AS}	65	mJ
Avalanche Current		I_{AR}	5	A
Repetitive Avalanche Energy*		E_{AR}	2.5	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$



Weight : 1.9g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	5.0	$^\circ C/W$
Thermal Resistance, Channel To Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$

Note ;

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

** $V_{DD} = 50V$, Starting $T_{ch} = 25^\circ C$, $L = 4.2mH$, $R_G = 25\Omega$, $I_{AR} = 5A$

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

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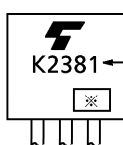
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA	
Drain Cut-off Current	IDSS	VDS = 200V, VGS = 0V	—	—	100	μA	
Drain-Source Breakdown Voltage	V(BR)DSS	ID = 10mA, VGS = 0V	200	—	—	V	
Gate Threshold Voltage	Vth	VDS = 10V, ID = 1mA	1.5	—	3.5	V	
Drain-Source ON Resistance	RDS(ON)	VGS = 10V, ID = 2.5A	—	0.56	0.8	Ω	
Forward Transfer Admittance	Yfs	VDS = 10V, ID = 2.5A	2.0	4.5	—	S	
Input Capacitance	Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	440	—	pF	
Reverse Transfer Capacitance	Crss		—	35	—		
Output Capacitance	Coss		—	120	—		
Switching Time	Rise Time	tr		—	15	—	ns
	Turn-on Time	ton		—	20	—	
	Fall Time	tf		—	15	—	
	Turn-off Time	toff		—	60	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Qg	VDD = 100V, VGS = 10V	—	10	—	nC	
Gate-Source Charge	Qgs	ID = 5A	—	6	—		
Gate-Drain ("Miller") Charge	Qgd		—	4	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	5	A
Pulse Drain Reverse Current	IDRP	—	—	—	20	A
Diode Forward Voltage	VDSF	IDR = 5A, VGS = 0V	—	—	-2.0	V
Reverse Recovery Time	trr	IDR = 5A, VGS = 0V	—	150	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 100A / μs	—	0.45	—	μC

MARKING

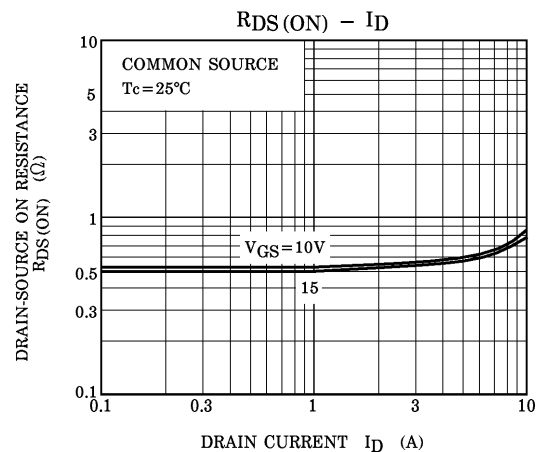
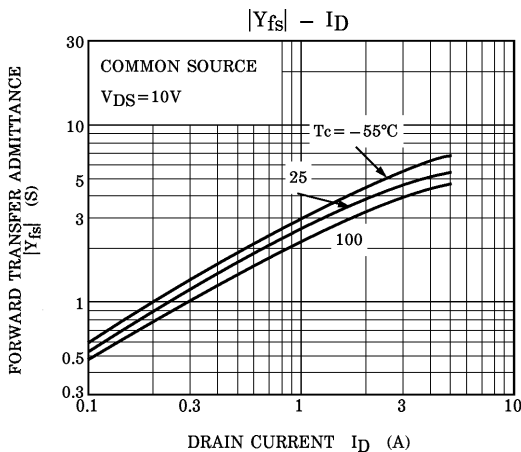
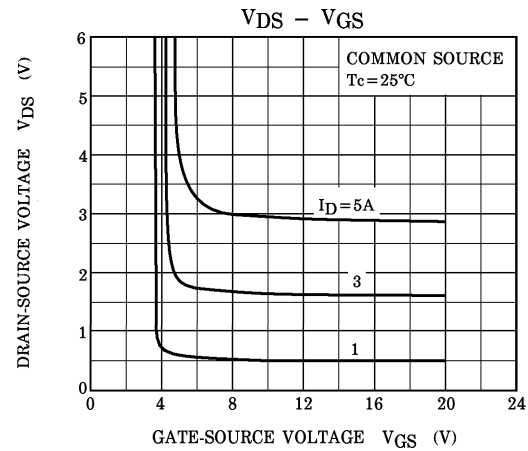
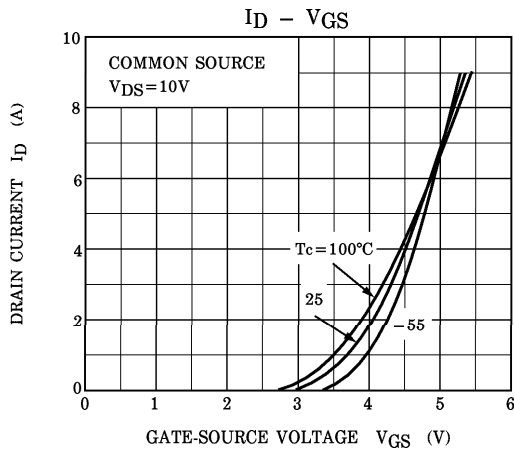
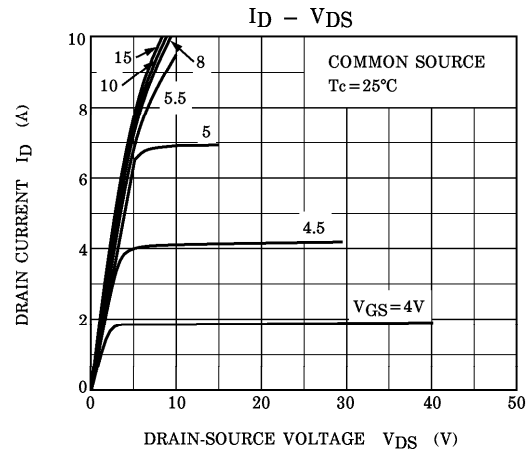
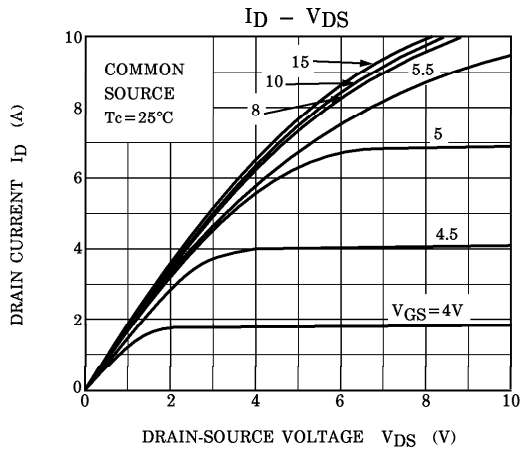


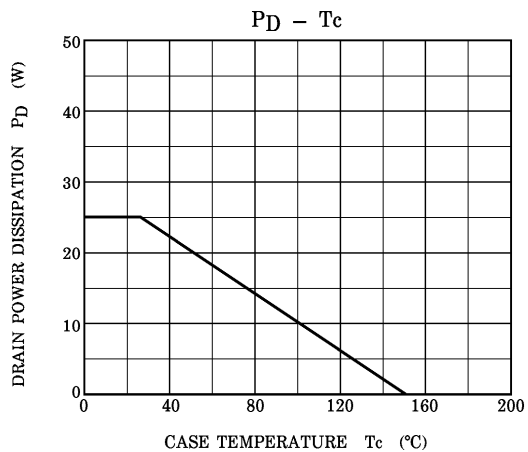
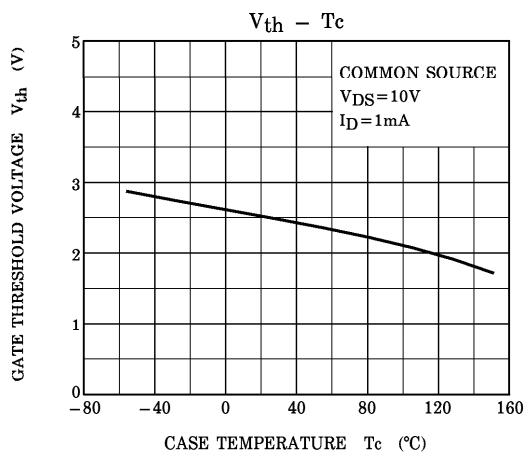
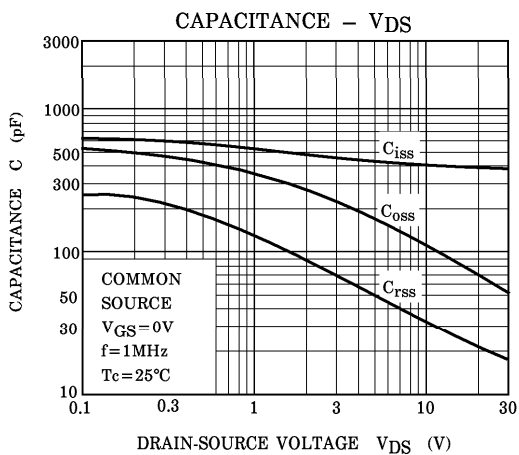
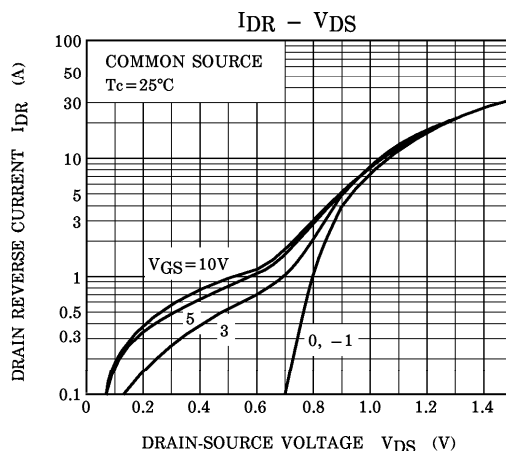
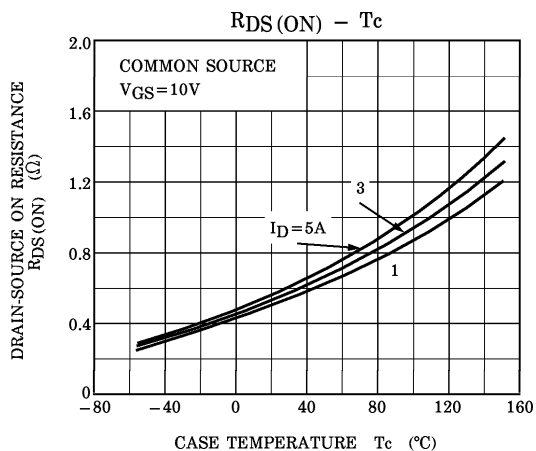
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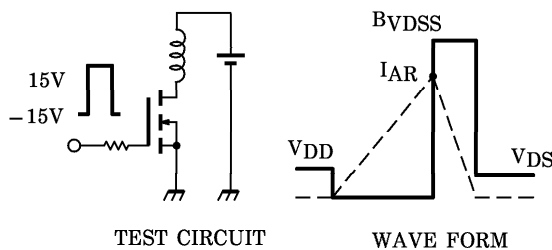
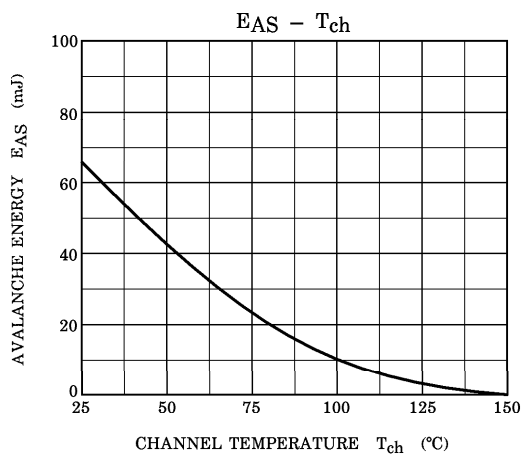
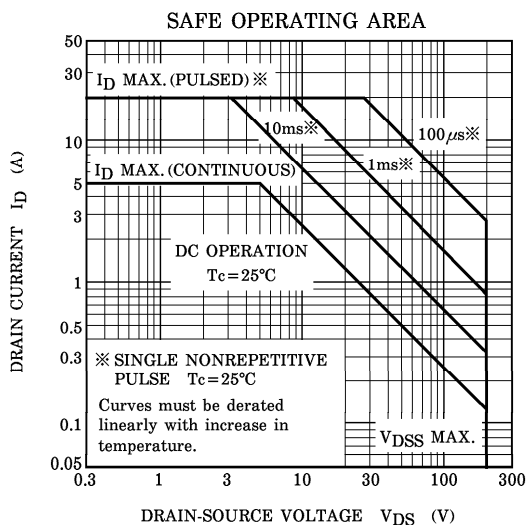
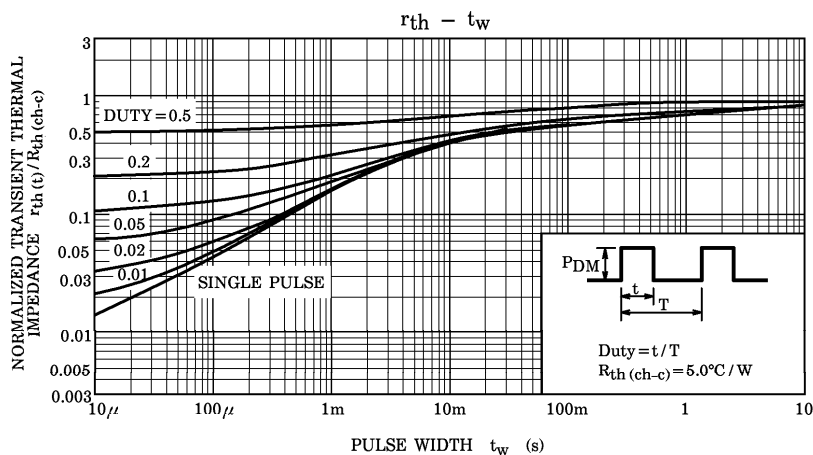
※ Lot Number

□ □ Month (Starting from Alphabet A)

□ Year (Last Number of the Christian Era)







Peak $I_{AR} = 5A$, $R_G = 25\Omega$
 $V_{DD} = 50V$, $L = 4.2mH$

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