

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L<sup>2</sup>-π-MOSV)

# 2SK2385

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

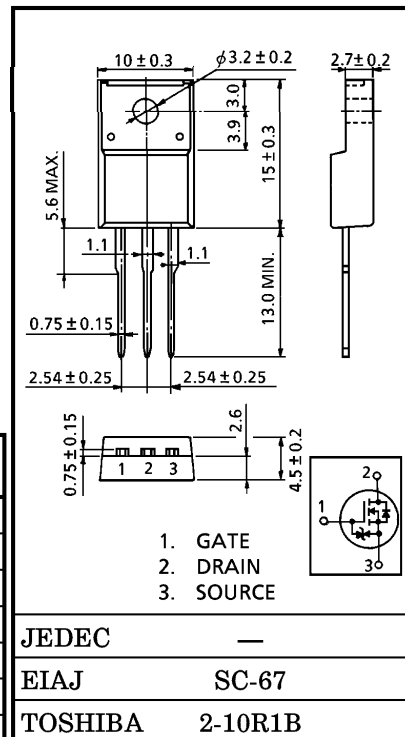
INDUSTRIAL APPLICATIONS

Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 22m\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 27S$  (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	$I_D$	36
	Pulse	$I_{DP}$	144
Drain Power Dissipation (Tc = 25°C)	$P_D$	40	W
Single Pulse Avalanche Energy**	$E_{AS}$	365	mJ
Avalanche Current	$I_{AR}$	36	A
Repetitive Avalanche Energy*	$E_{AR}$	4	mJ
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C



Weight : 1.9g

OTHER CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	3.125	°C/W
Thermal Resistance, Channel To Ambient	$R_{th(ch-a)}$	62.5	°C/W

Note ;

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

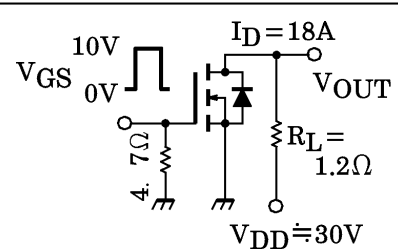
\*\*  $V_{DD} = 25V$ , Starting  $T_{ch} = 25°C$ ,  $L = 383\mu H$ ,  $R_G = 25\Omega$ ,  $I_{AR} = 36A$

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

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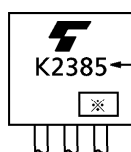
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA	
Drain Cut-off Current	IDSS	VDS = 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 = 15A	—	40	55	mΩ	
		VDS = 10V, ID = 18A	—	22	30		
Forward Transfer Admittance	Yfs	VDS = 10V, ID = 18A	15	27	—	S	
Input Capacitance	Ciss	VDS = 10V, VGS = 0V, f = 1MHz	—	1800	—	pF	
Reverse Transfer Capacitance	Crss		—	350	—		
Output Capacitance	Coss		—	900	—		
Switching Time	Rise Time	tr		—	20	—	ns
	Turn-on Time	ton		—	30	—	
	Fall Time	tf		—	40	—	
	Turn-off Time	t <sub>off</sub>		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	130	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Qg	VDD ≐ 48V, VGS = 10V	—	60	—	nC	
Gate-Source Charge	Qgs	ID = 36A	—	40	—		
Gate-Drain ("Miller") Charge	Qgd		—	20	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	36	A
Pulse Drain Reverse Current	IDRP	—	—	—	144	A
Diode Forward Voltage	VDSF	IDR = 36A, VGS = 0V	—	—	-1.8	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 36A, VGS = 0V	—	60	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dIDR / dt = 50A / μs	—	51	—	nC

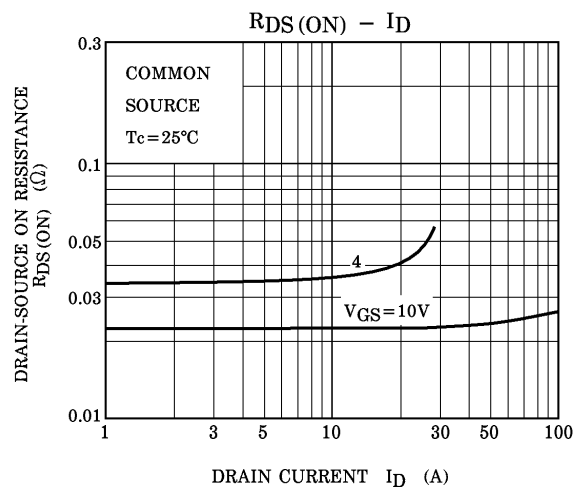
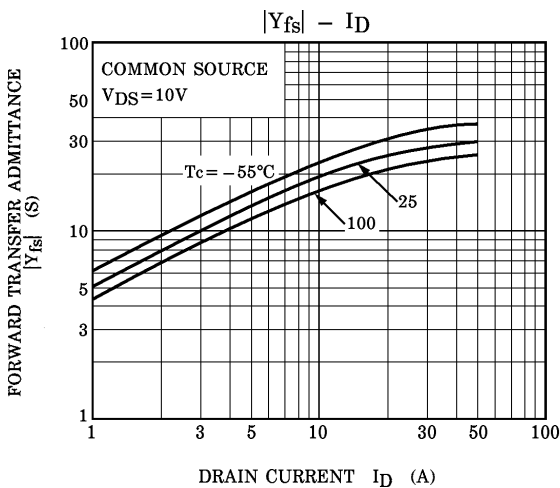
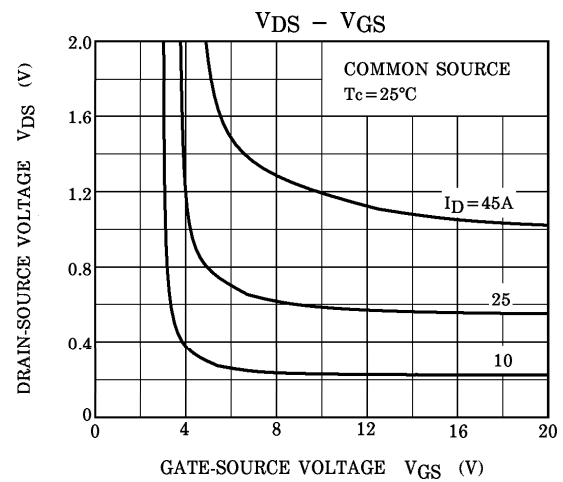
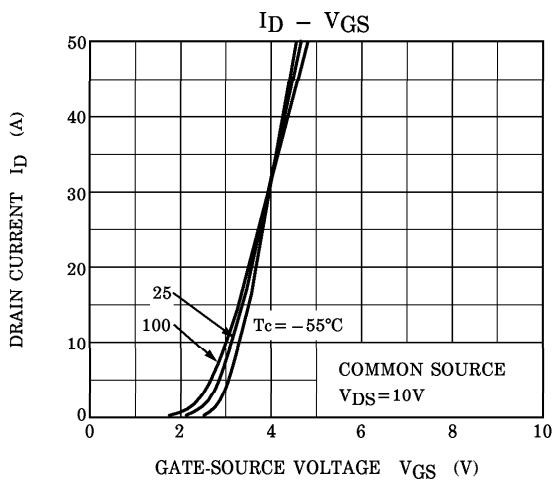
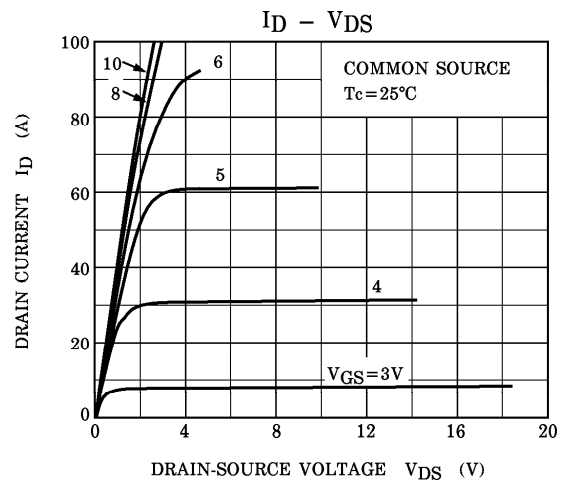
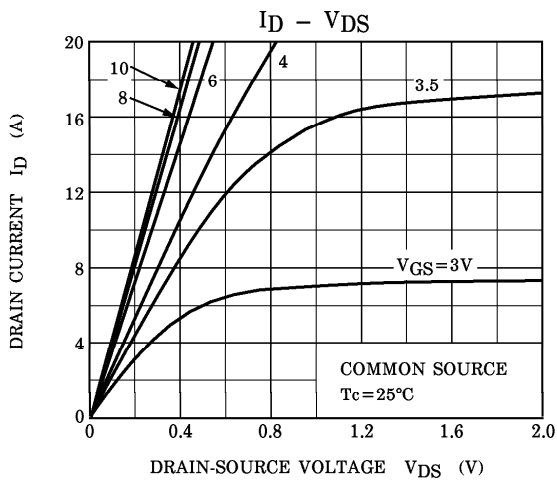
MARKING

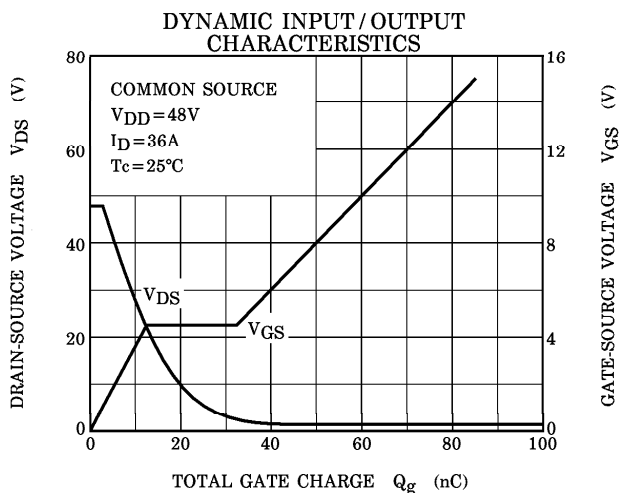
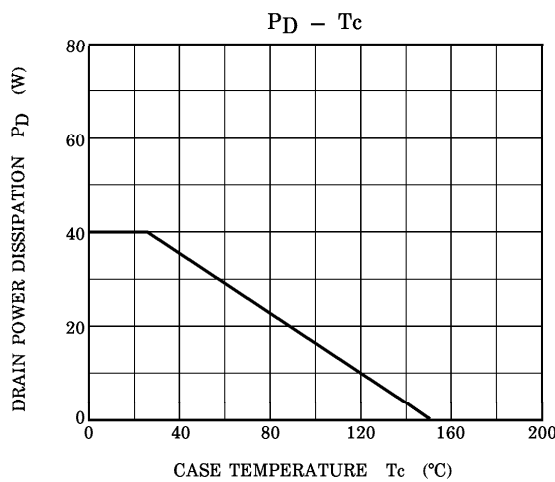
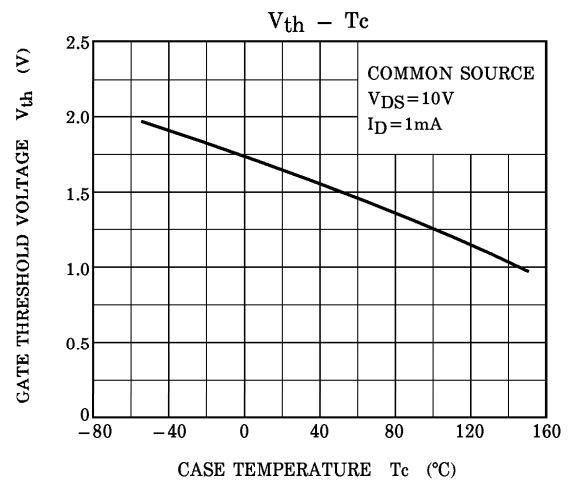
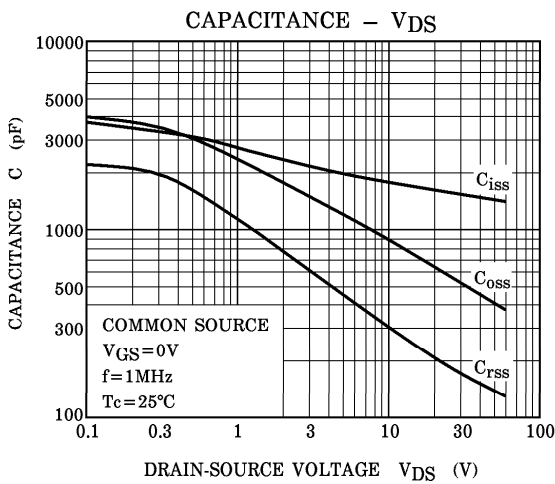
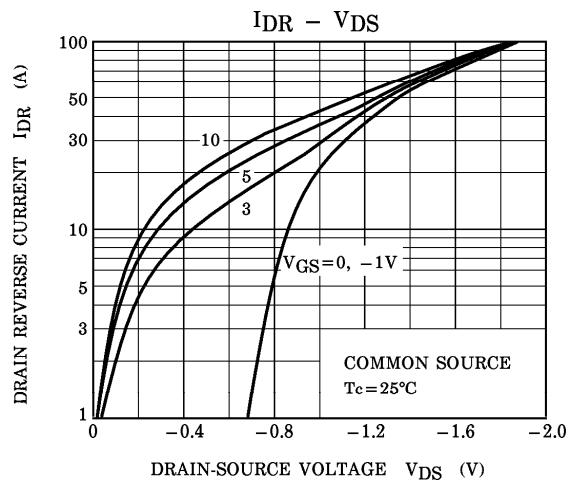
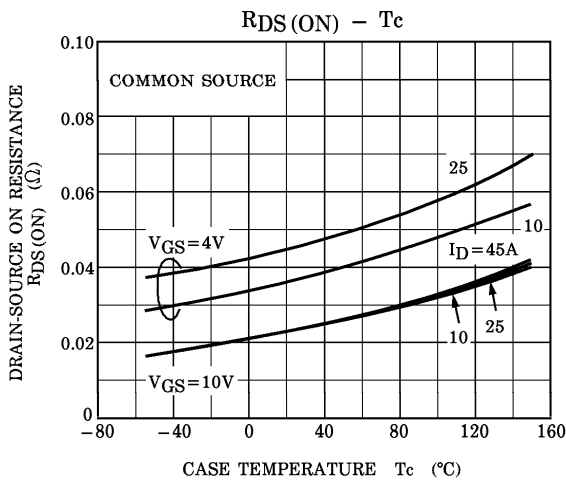


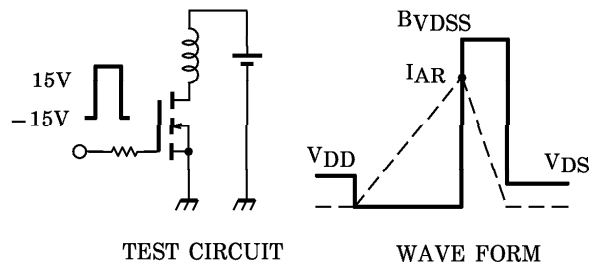
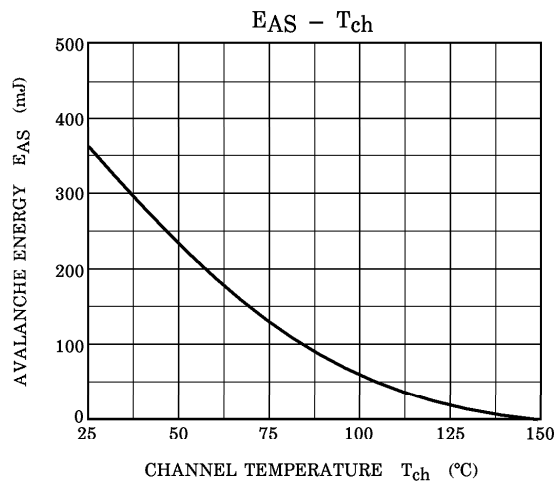
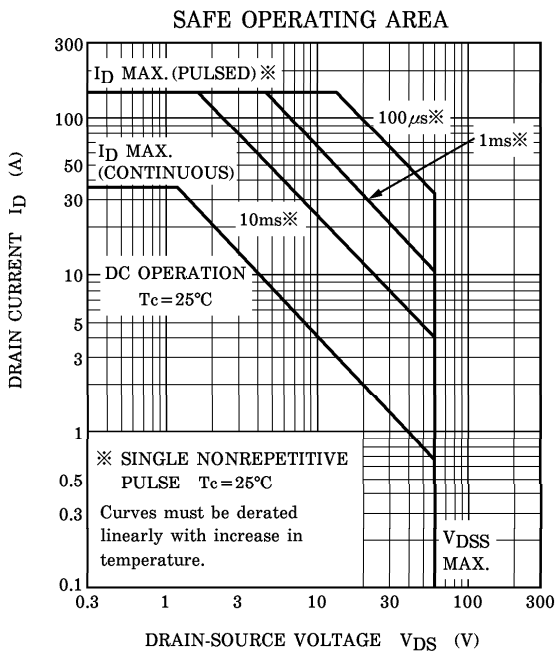
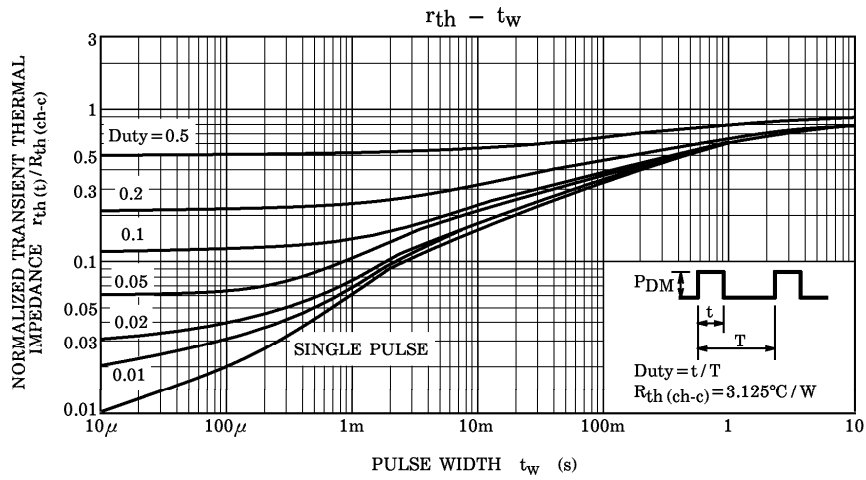
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 36A$ ,  $R_G = 25\Omega$   $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left( \frac{BVDSS}{BVDSS - V_{DD}} \right)$   
 $V_{DD} = 25V$ ,  $L = 383\mu H$

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