

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

2SK2385

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

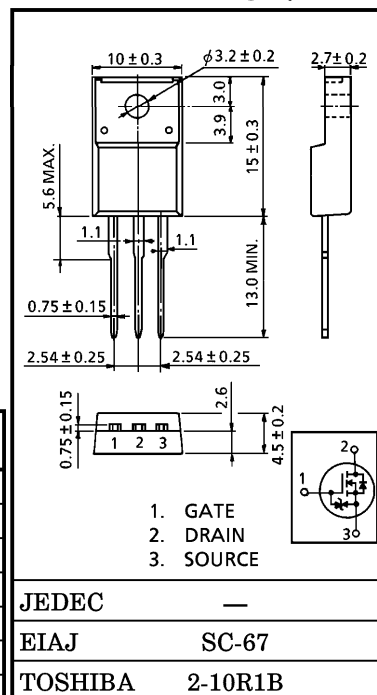
INDUSTRIAL APPLICATIONS

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 A
	Pulse	I_{DP}	144 A
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

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	3.125	°C/W
Thermal Resistance, Channel To Ambient	$R_{th(ch-a)}$	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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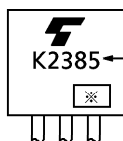
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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 _{off}		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 _{rr}	IDR = 36A, VGS = 0V	—	60	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 50A / μs	—	51	—	nC

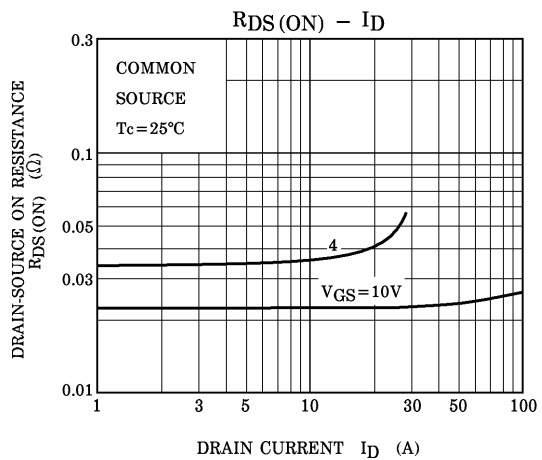
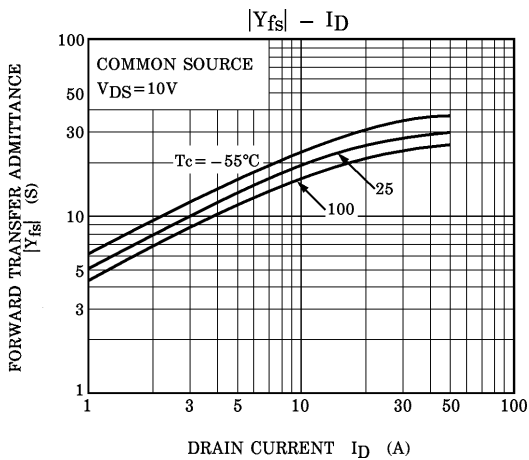
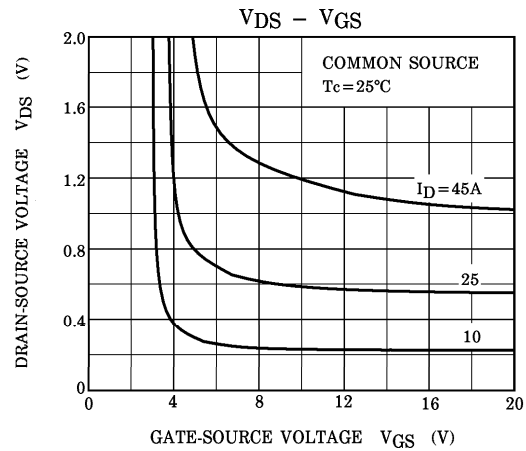
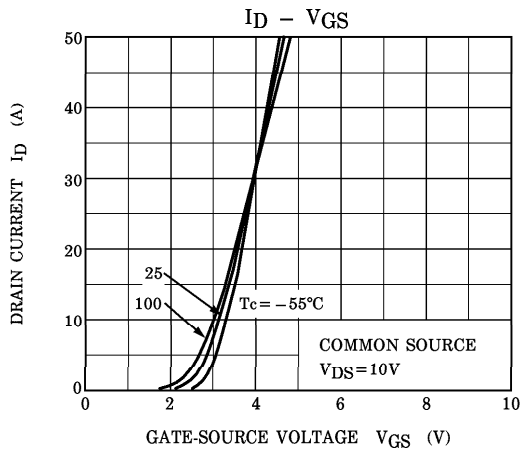
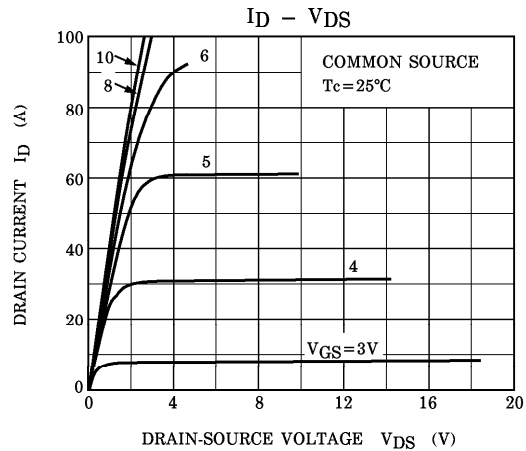
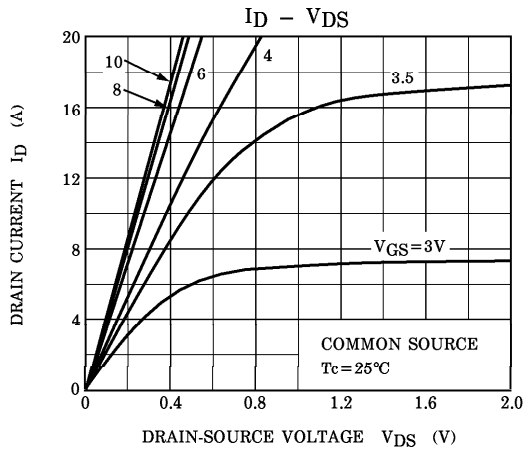
MARKING

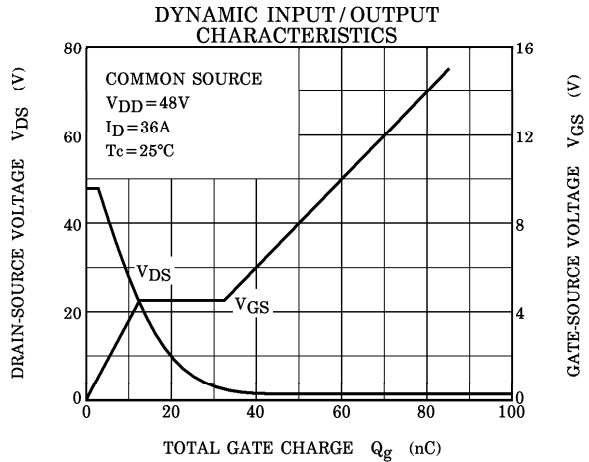
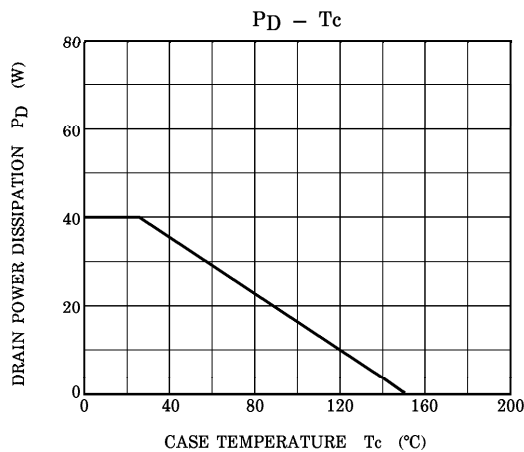
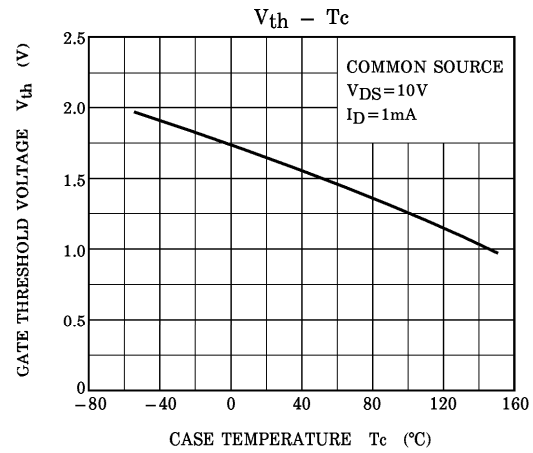
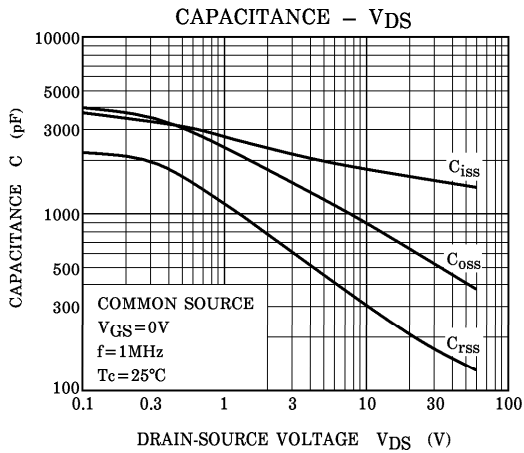
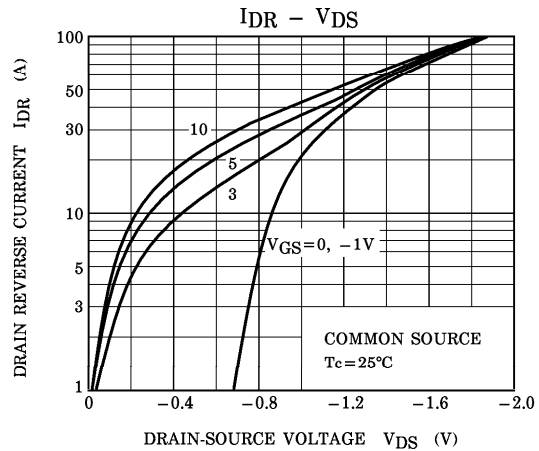
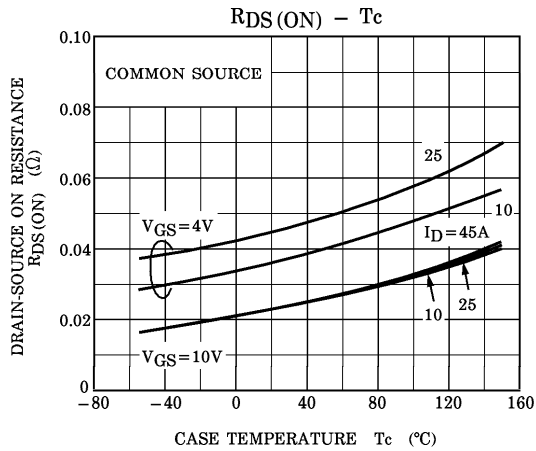


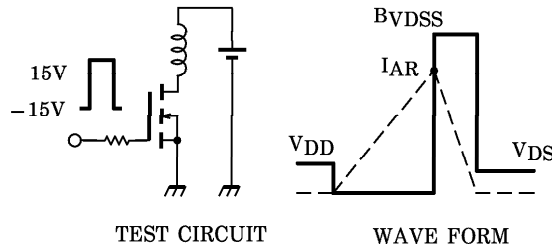
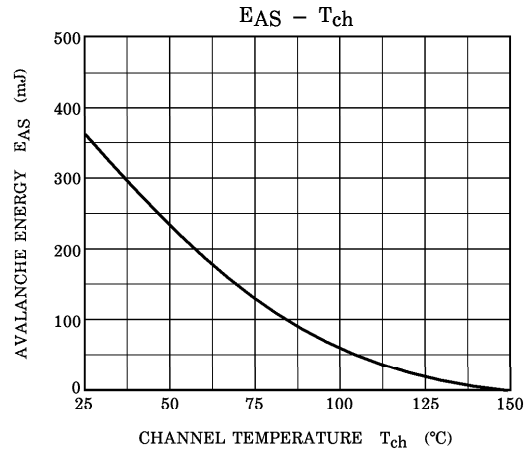
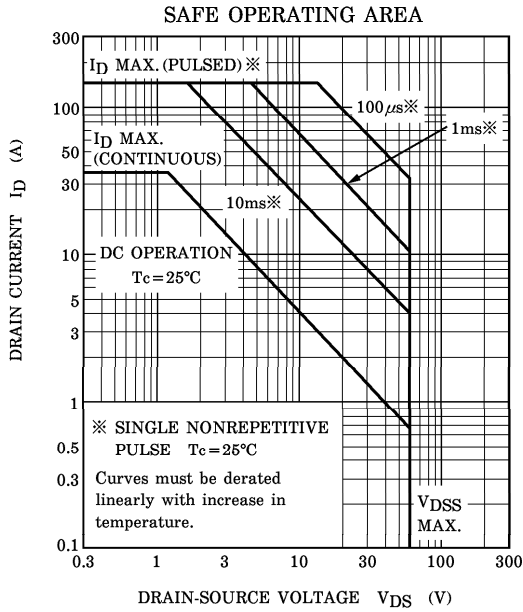
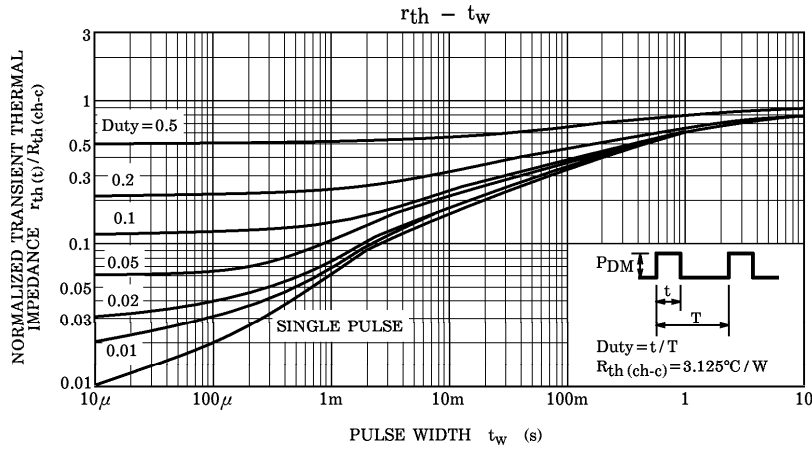
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 36A$, $R_G = 25\Omega$
 $V_{DD} = 25V$, $L = 383\mu H$

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