

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

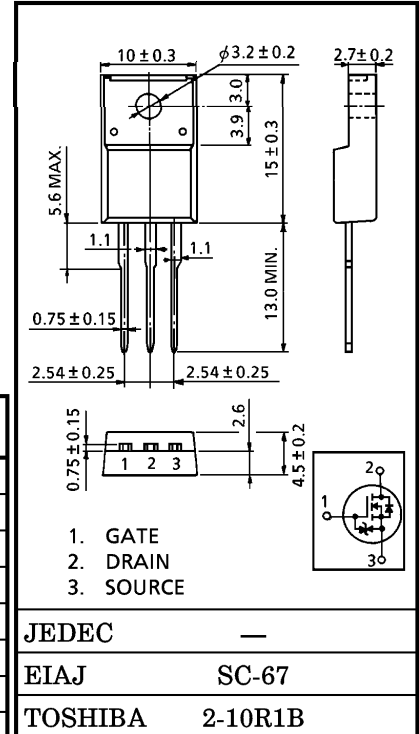
2SK2232

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 : $R_{DS(ON)} = 36m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 16S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 60V$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0V$ ($V_{DS} = 10V, I_D = 1mA$)



Weight : 1.9g

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	25
	Pulse	I_{DP}	100
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	35	W
Single Pulse Avalanche Energy**	E_{AS}	156	mJ
Avalanche Current	I_{AR}	25	A
Repetitive Avalanche Energy*	E_{AR}	3.5	mJ
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel To Case	$R_{th(ch-c)}$	3.57	°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 $T_{ch} = 25^\circ C$, $L = 339\mu H$, $R_G = 25\Omega$, $I_{AR} = 25A$

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

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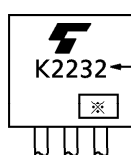
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±16V, V _{DS} = 0V	—	—	±10	μA
Drain Cut-off Current		I _{DSS}	V _{DS} = 60V, V _{GS} = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V (BR) DSS	I _D = 10mA, V _{GS} = 0V	60	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} = 10V, I _D = 1mA	0.8	—	2.0	V
Drain-Source ON Resistance		R _{DS (ON)}	V _{GS} = 4V, I _D = 12A	—	0.057	0.08	Ω
			V _{GS} = 10V, I _D = 12A	—	0.036	0.046	
Forward Transfer Admittance		Y _{fs}	V _{DS} = 10V, I _D = 12A	10	16	—	S
Input Capacitance		C _{iss}	V _{DS} = 10V, V _{GS} = 0V f = 1MHz	—	1000	—	pF
Reverse Transfer Capacitance		C _{rss}		—	200	—	
Output Capacitance		C _{oss}		—	550	—	
Switching Time	Rise Time	t _r		—	20	—	ns
	Turn-on Time	t _{on}		—	30	—	
	Fall Time	t _f		—	55	—	
	Turn-off Time	t _{off}		V _{IN} : t _r , t _f < 5ns Duty ≤ 1%, t _w = 10μs	—	130	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≐ 48V, V _{GS} = 10V I _D = 25A	—	38	—	nC
Gate-Source Charge		Q _{gs}		—	25	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	13	—	

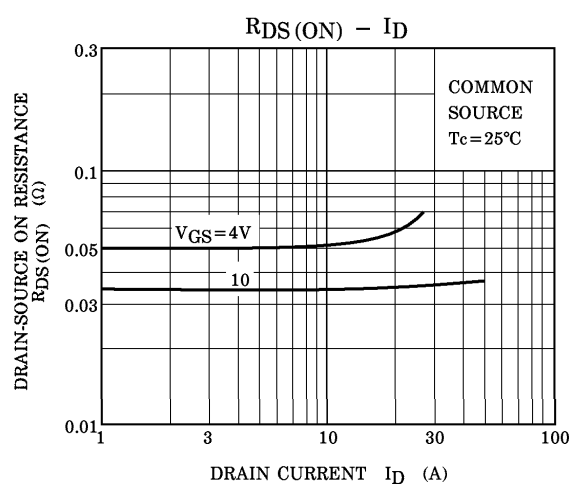
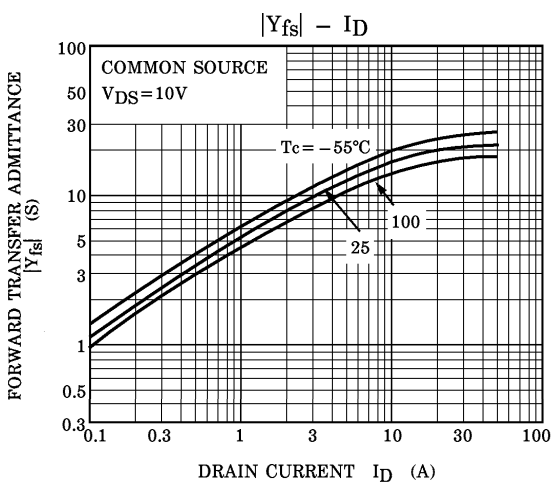
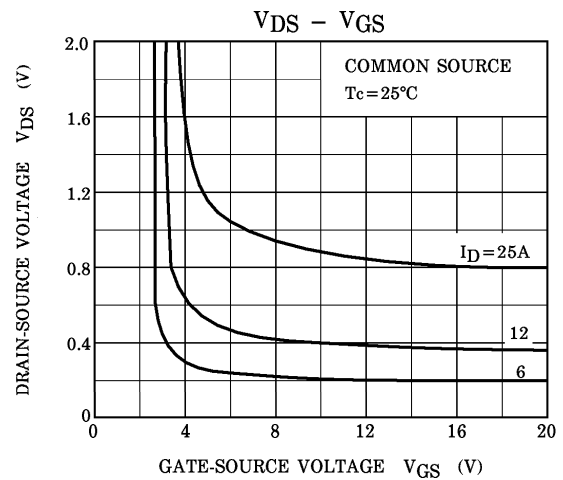
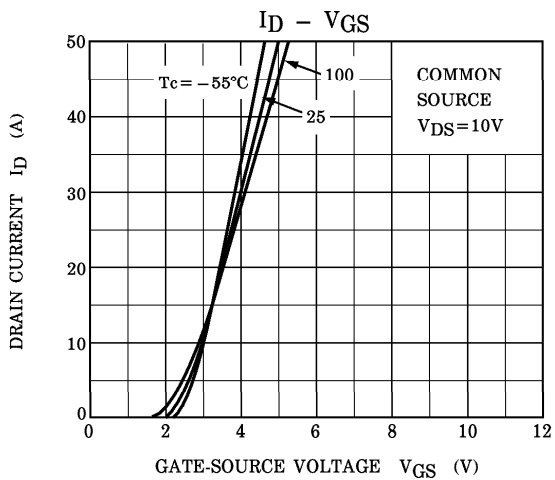
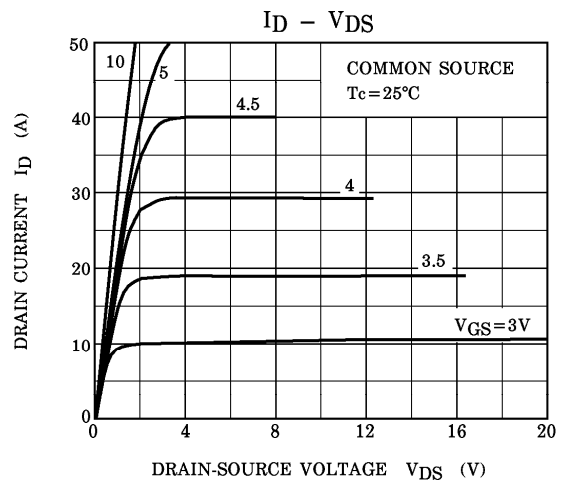
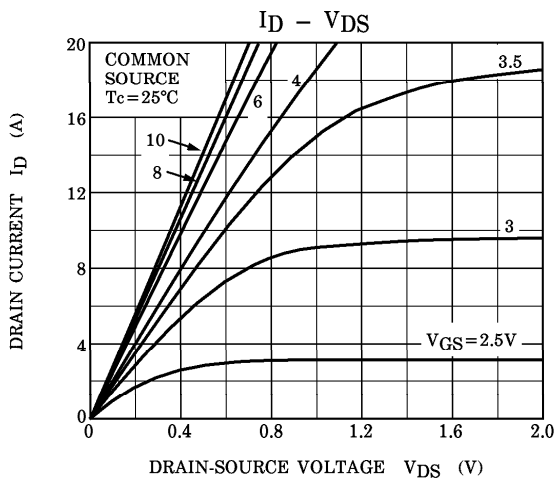
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

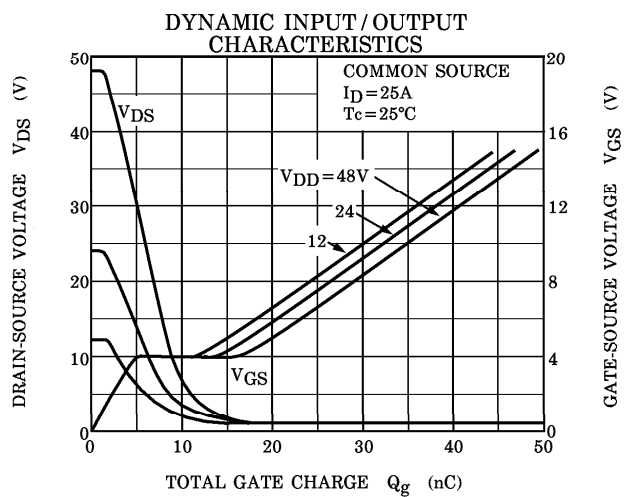
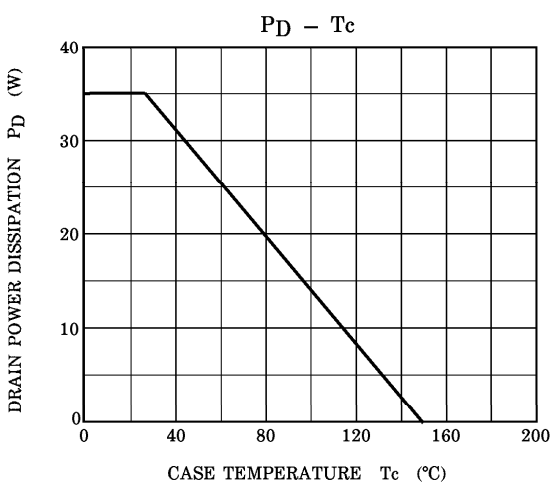
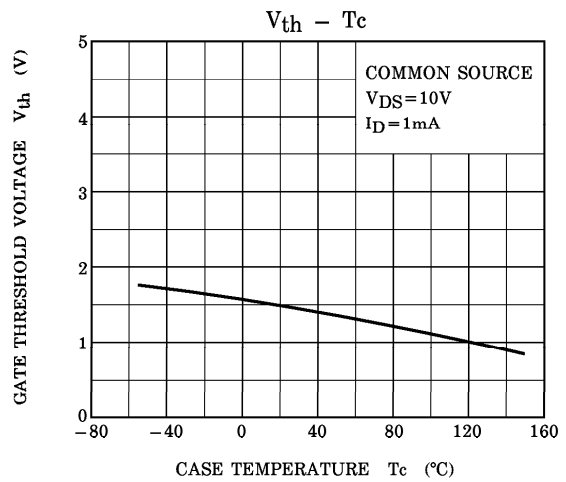
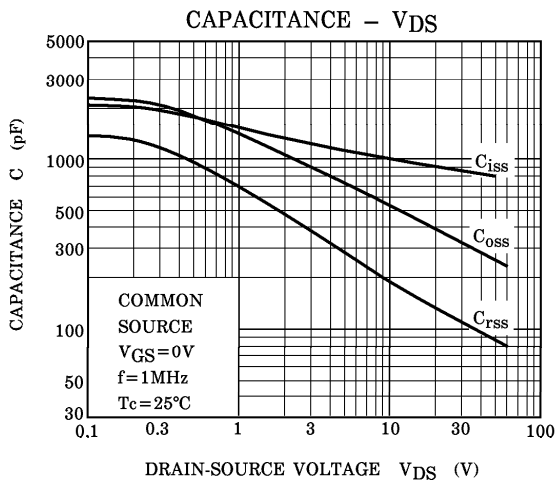
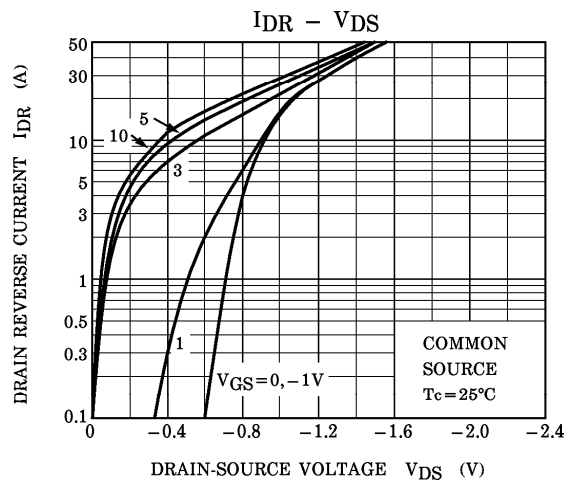
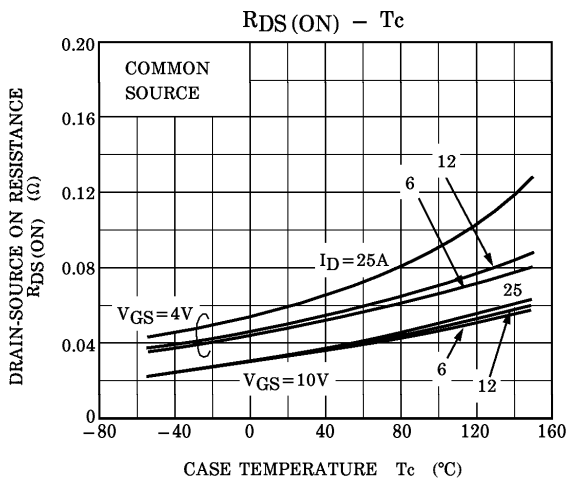
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	25	A
Pulse Drain Reverse Current	I _{D RP}	—	—	—	100	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 25A, V _{GS} = 0V	—	—	-1.8	V
Reverse Recovery Time	t _{rr}	I _{DR} = 25A, V _{GS} = 0V	—	50	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} / dt = 50A / μs	—	35	—	nC

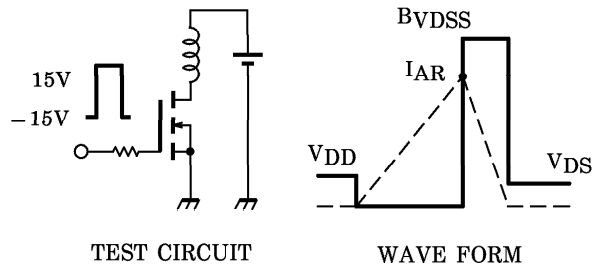
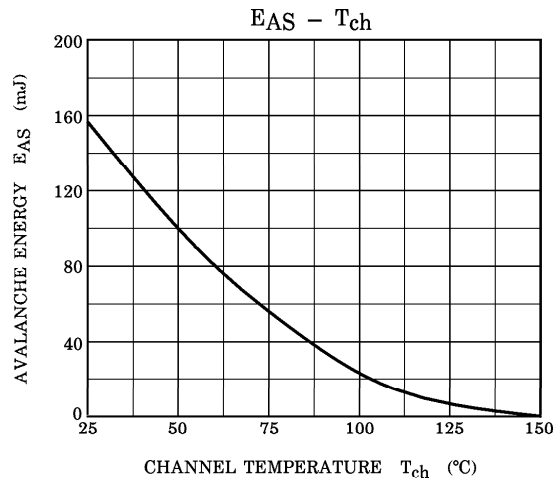
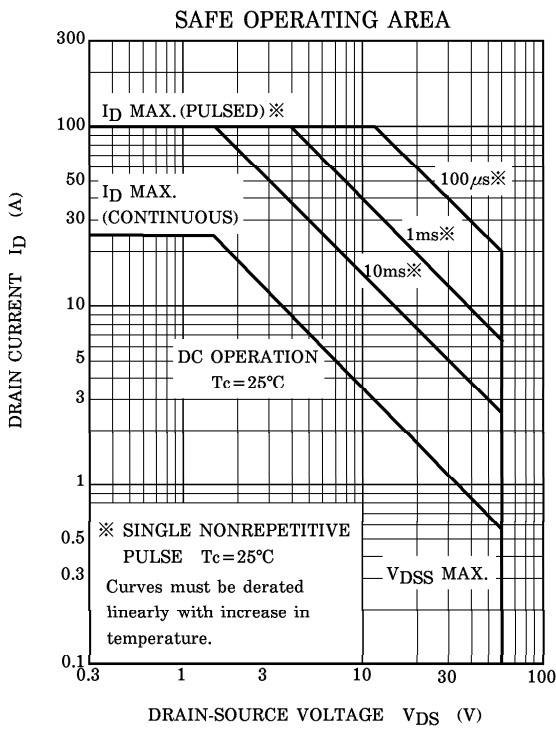
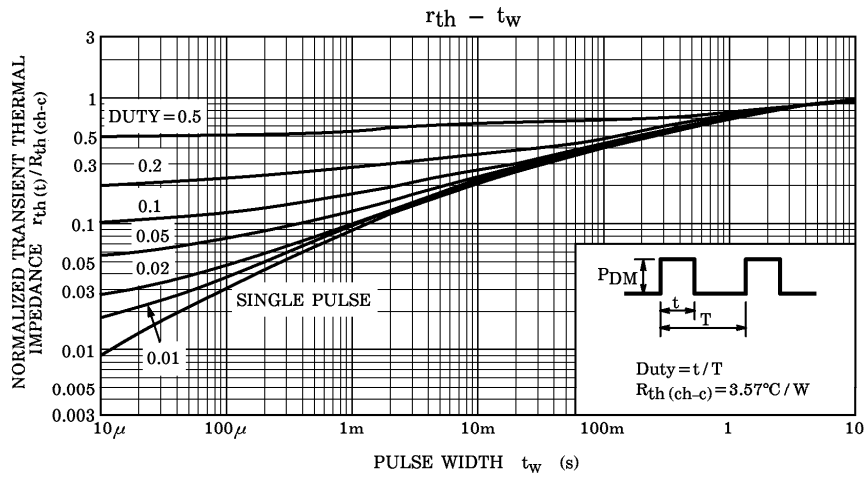
MARKING



TYPE ← K2232
 ※ Lot Number
 □ □ — Month (Starting from Alphabet A)
 — Year (Last Number of the Christian Era)







Peak $I_{AR} = 25A$, $R_G = 25\Omega$
 $V_{DD} = 25V$, $L = 339\mu H$

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