

TENTATIVE TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (U-MOSII)

TPC8303

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 : $R_{DS(ON)} = 27m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 7S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -10\mu A$ (Max.) ($V_{DS} = -30V$)
- Enhancement-Mode : $V_{th} = -0.8 \sim -2.0V$
($V_{DS} = -10V$, $I_D = -1mA$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-30	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)		V_{DGR}	-30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	-4.5	A
	Pulse	I_{DP}	-18	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	2.0	W
Single Pulse Avalanche Energy**		E_{AS}	26	mJ
Avalanche Current		I_{AR}	-4.5	A
Repetitive Avalanche Energy*		E_{AR}	0.2	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$

THERMAL CHARACTERISTICS

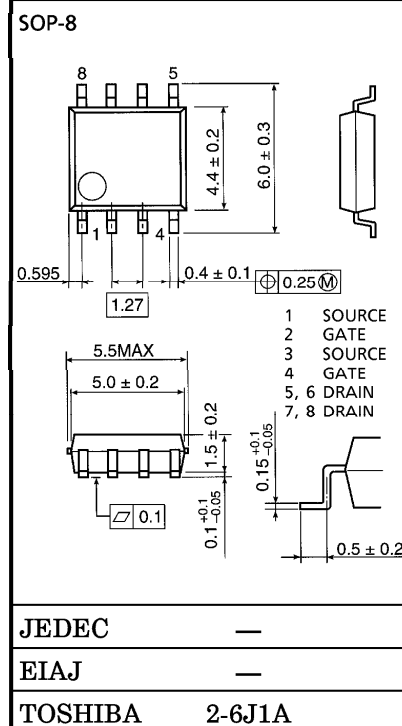
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C/W$

Note ;

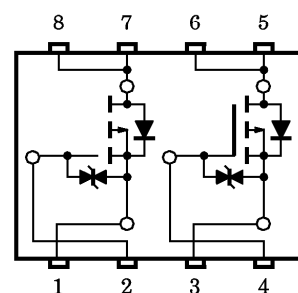
* Repetitive rating ; Pulse Width Limited by Max. Junction temperature.

** $V_{DD} = 24V$, Starting $T_{ch} = 25^\circ C$, $L = 1.0mH$, $R_G = 25\Omega$, $I_{AR} = 4.5A$

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



CIRCUIT CONFIGURATION



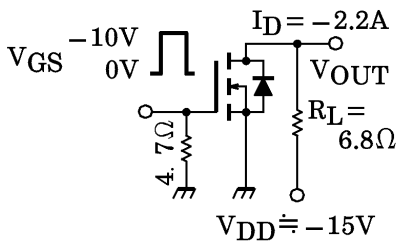
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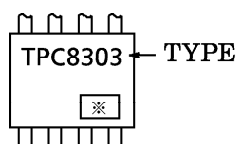
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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} = −30V, V _{GS} = 0V	—	—	−10	μA
Drain-Source Breakdown Voltage	V (BR) DSS	I _D = −10mA, V _{GS} = 0V	−30	—	—	V	
	V (BR) DSX	I _D = 10mA, V _{GS} = 20V	15	—	—		
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 = −2.2A	—	55	65	mΩ	
	R _{DS (ON)}	V _{GS} = −10V, I _D = −2.2A	—	27	35		
Forward Transfer Admittance		Y _{fs}	V _{DS} = −10V, I _D = −2.2A	3.5	7	—	S
Input Capacitance		C _{iss}	V _{DS} = −10V, V _{GS} = 0V, f = 1MHz	—	970	—	pF
Reverse Transfer Capacitance		C _{rss}		—	180	—	
Output Capacitance		C _{oss}		—	370	—	
Switching Time	Rise Time	t _r		—	17	—	ns
	Turn-On Time	t _{on}		—	20	—	
	Fall Time	t _f		—	75	—	
	Turn-Off Time	t _{off}		—	160	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≐ −24V, V _{GS} = −10V I _D = −4.5A	—	28	—	nC
Gate-Source Charge		Q _{gs}		—	16	—	
Gate-Drain (“Miller”) Charge		Q _{gd}		—	12	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-4.5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-18	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -4.5A, V_{GS} = 0V$	—	—	1.2	V

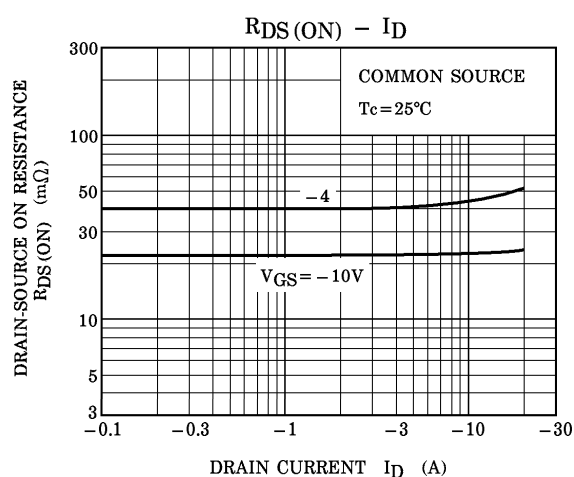
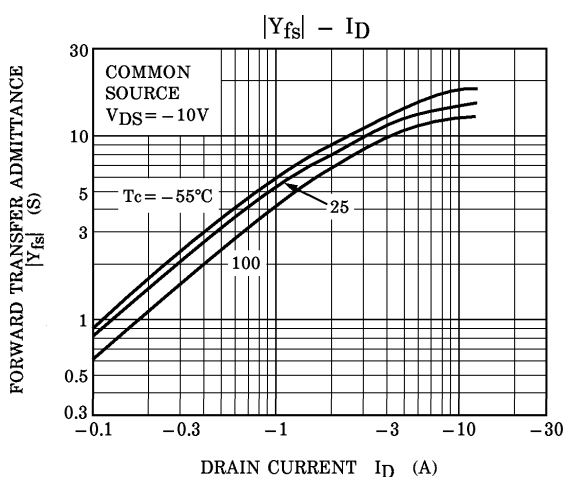
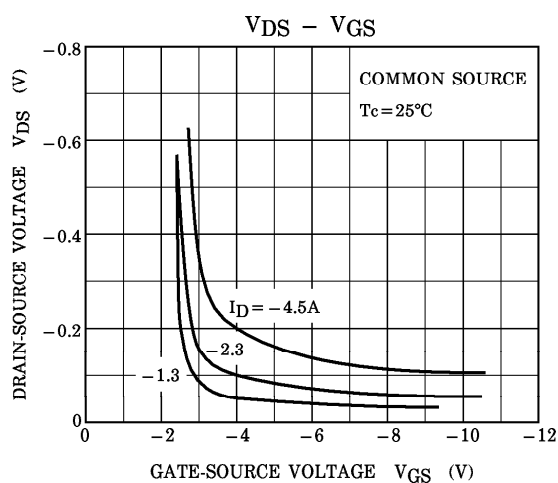
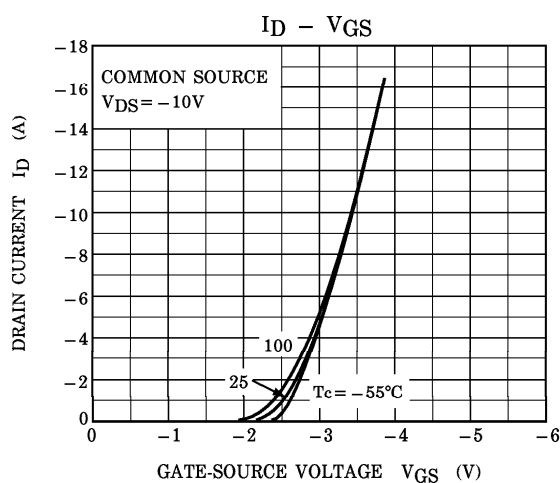
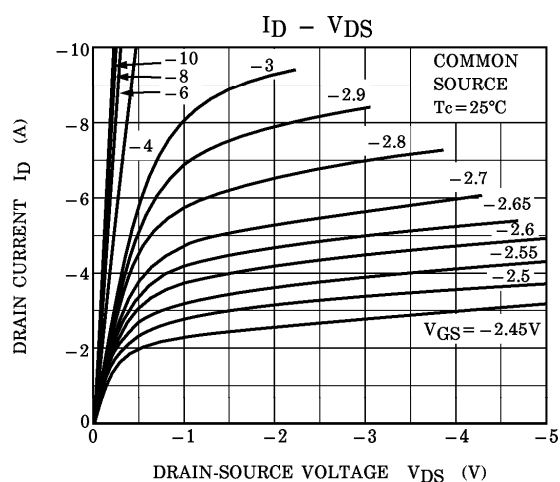
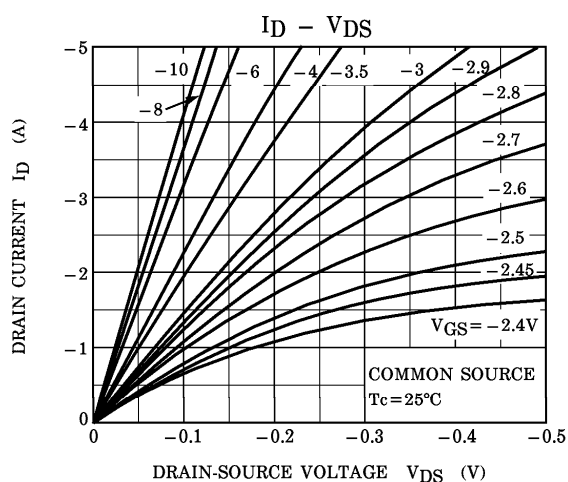
MARKING

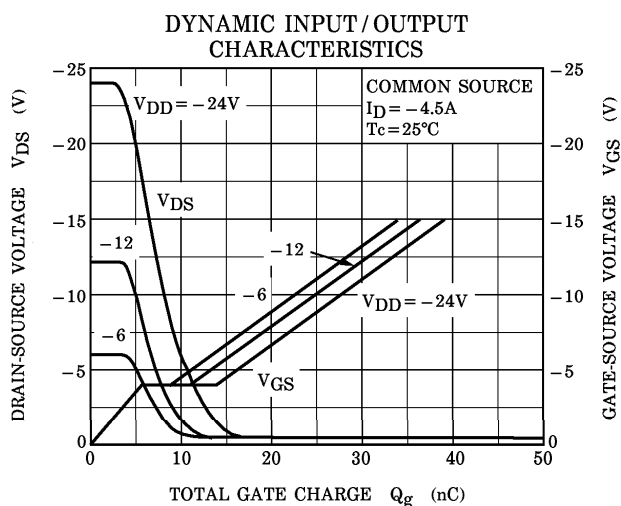
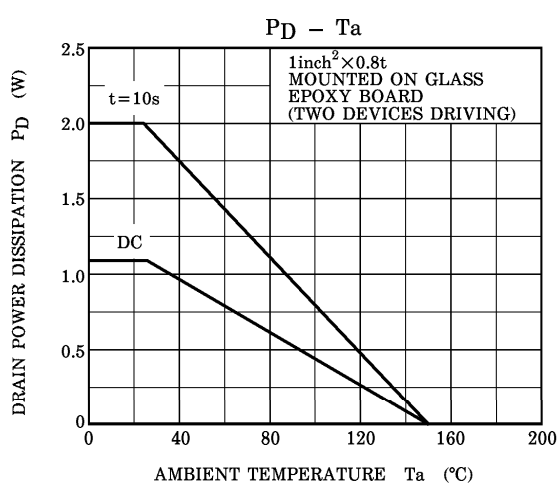
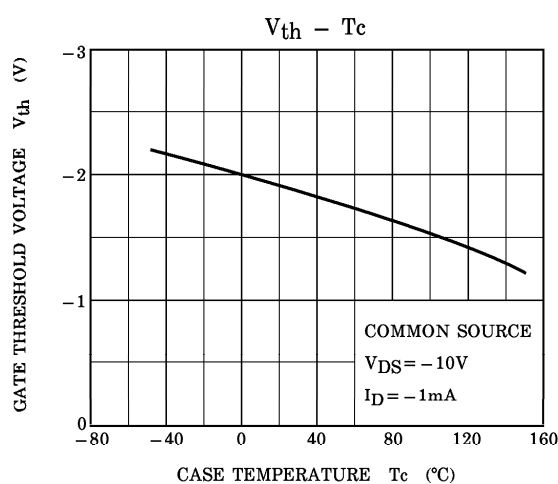
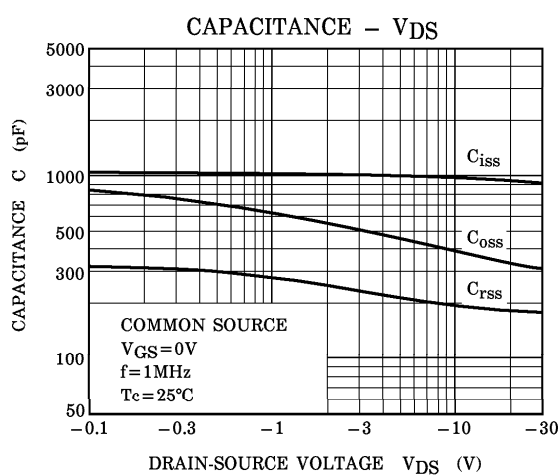
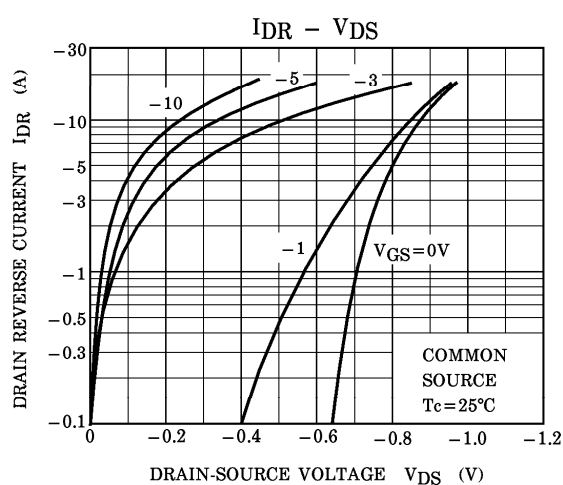
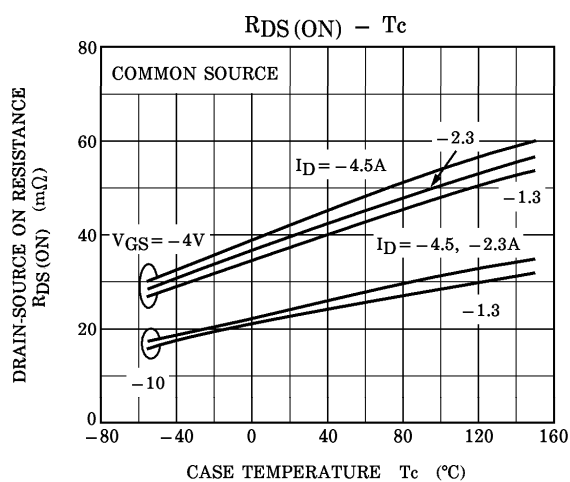


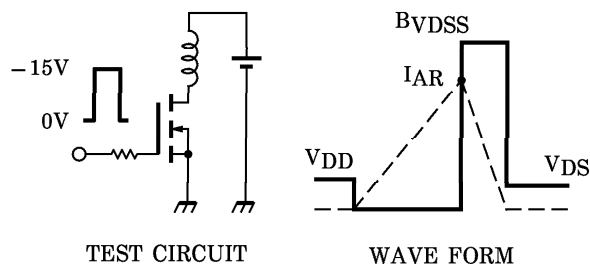
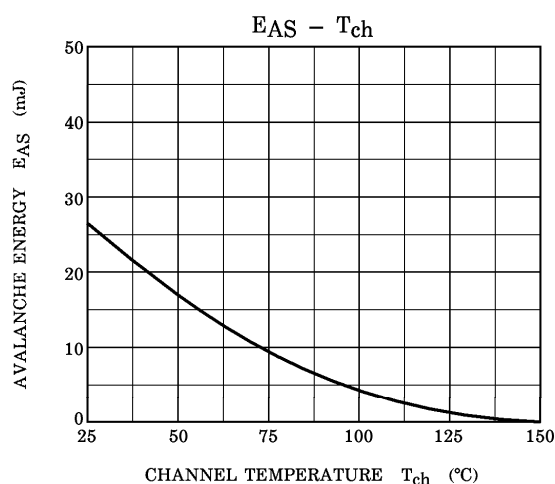
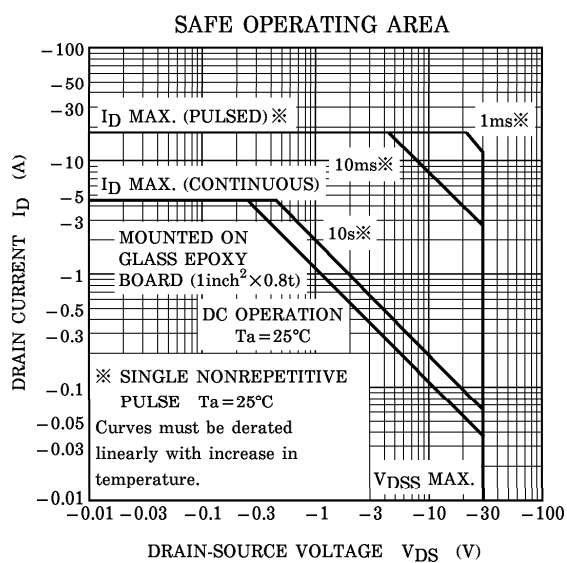
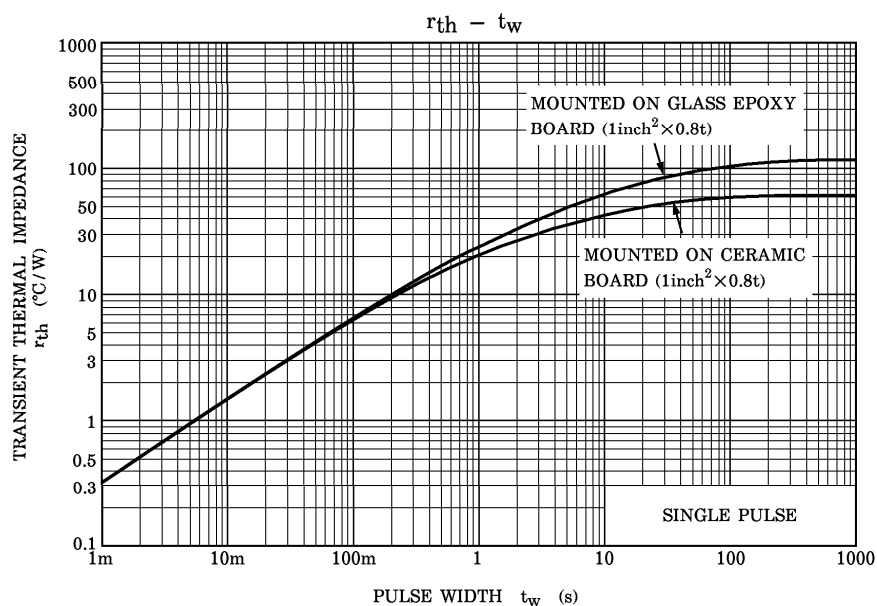
※ Lot Number

 Month (Starting from Alphabet A)

 Year (Last Number of the Christian Era)







Peak $I_{AR} = -4.5A$, $R_G = 25\Omega$
 $V_{DD} = -24V$, $L = 1.0mH$

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