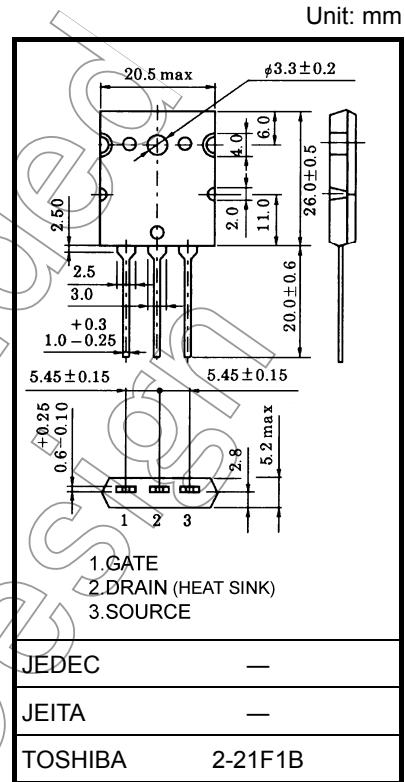


TOSHIBA Field Effect Transistor Silicon N Channel MOS Type ( $\pi$ -MOSII)<sup>5</sup>

## 2SK1489

## Chopper Regulator Applications

- Low drain-source ON resistance :  $R_{DS(ON)} = 0.8 \Omega$  (typ.)
- High forward transfer admittance :  $|Y_{fs}| = 6.0 S$  (typ.)
- Low leakage current :  $I_{DSS} = 300 \mu A$  (max) ( $V_{DS} = 800 V$ )
- Enhancement mode :  $V_{th} = 1.5$  to  $3.5 V$  ( $V_{DS} = 10 V$ ,  $I_D = 1 mA$ )

Absolute Maximum Ratings ( $T_a = 25^\circ C$ )

Characteristics	Symbol	Rating	Unit
Drain-source voltage	$V_{DSS}$	1000	V
Drain-gate voltage ( $R_{GS} = 20 k\Omega$ )	$V_{DGR}$	1000	V
Gate-source voltage	$V_{GSS}$	$\pm 30$	V
Drain current	DC (Note 1)	$I_D$	A
	Pulse (Note 1)	$I_{DP}$	
Drain power dissipation ( $T_c = 25^\circ C$ )	$P_D$	200	W
Channel temperature	$T_{ch}$	150	$^\circ C$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ C$

Weight: 9.75 g (typ.)

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to case	$R_{th}(ch-c)$	0.625	$^\circ C / W$
Thermal resistance, channel to ambient	$R_{th}(ch-a)$	35.7	$^\circ C / W$

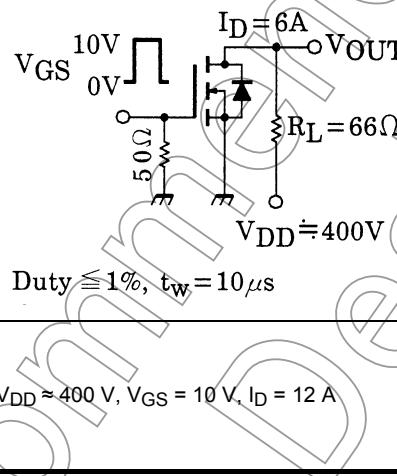
Note 1: Ensure that the channel temperature does not exceed 150°C.

This transistor is an electrostatic-sensitive device.

Please handle with caution.

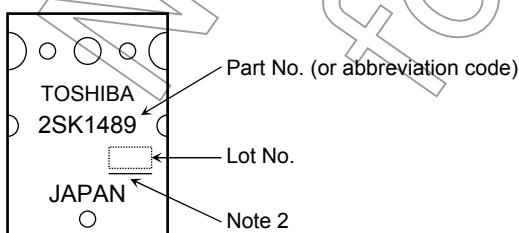
Electrical Characteristics ( $T_a = 25^\circ C$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = \pm 25 V, V_{DS} = 0 V$	—	—	$\pm 100$	nA
Drain cut-off current	$I_{DSS}$	$V_{DS} = 800 V, V_{GS} = 0 V$	—	—	300	$\mu A$
Drain-source breakdown voltage	$V_{(BR) DSS}$	$I_D = 10 mA, V_{GS} = 0 V$	1000	—	—	V
Gate threshold voltage	$V_{th}$	$V_{DS} = 10 V, I_D = 1 mA$	1.5	—	3.5	V
Drain-source ON resistance	$R_{DS (ON)}$	$V_{GS} = 10 V, I_D = 6 A$	—	0.8	1.0	$\Omega$
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 20 V, I_D = 6 A$	4.0	6.0	—	S
Input capacitance	$C_{iss}$	$V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz$	2000	—	—	pF
Reverse transfer capacitance	$C_{rss}$		—	220	—	
Output capacitance	$C_{oss}$		—	360	—	
Switching time	Rise time	$t_r$	—	100	—	ns
	Turn-on time	$t_{on}$	—	140	—	
	Fall time	$t_f$	—	150	—	
	Turn-off time	$t_{off}$	—	500	—	
Total gate charge (Gate-source plus gate-drain)	$Q_g$	$V_{DD} \approx 400 V, V_{GS} = 10 V, I_D = 12 A$	—	110	—	nC
Gate-source charge	$Q_{gs}$		—	50	—	
Gate-drain ("miller") charge	$Q_{gd}$		—	60	—	

Source-Drain Ratings and Characteristics ( $T_a = 25^\circ C$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Continuous drain reverse current (Note 1)	$I_{DR}$	—	—	—	12	A
Pulse drain reverse current (Note 1)	$I_{DRP}$	—	—	—	36	A
Forward voltage (diode)	$V_{DSF}$	$I_{DR} = 12 A, V_{GS} = 0 V$	—	—	-1.6	V

## Marking

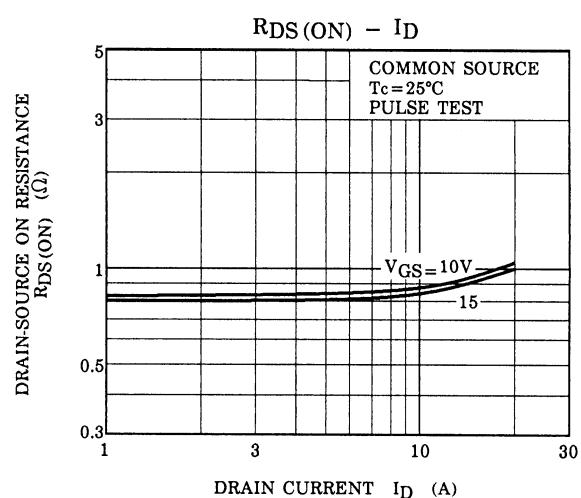
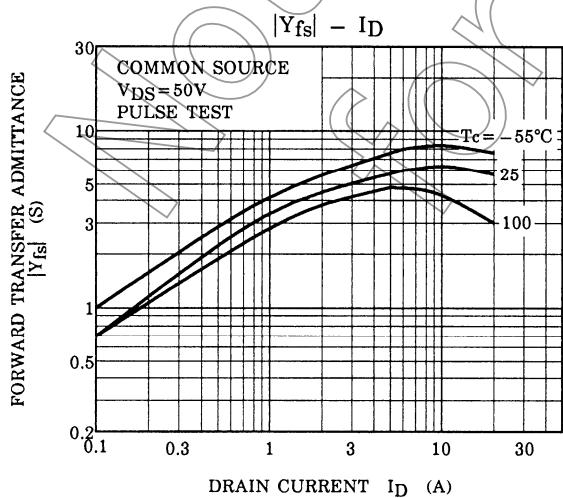
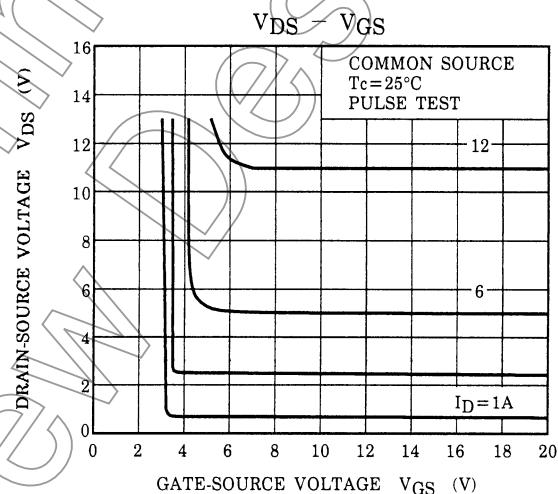
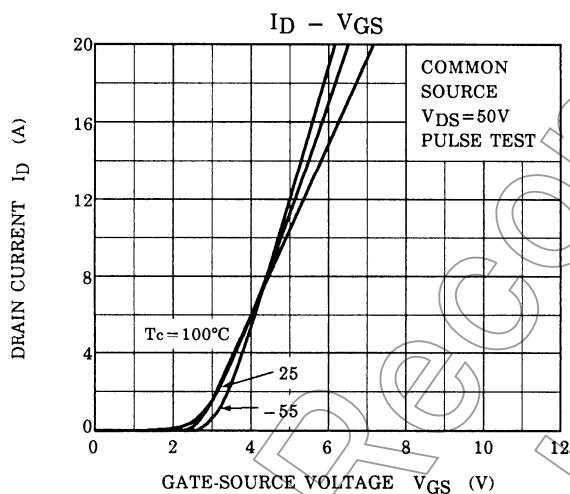
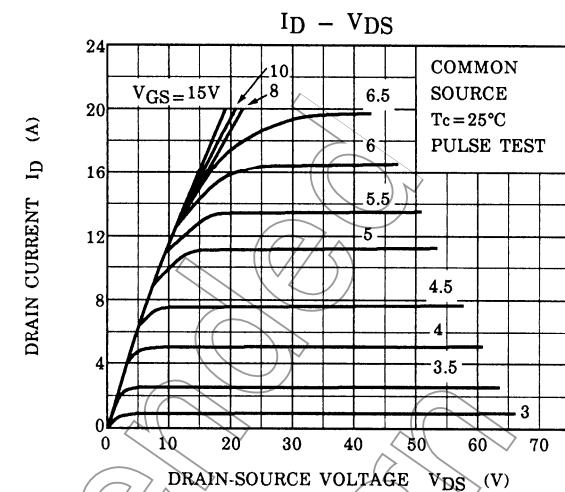
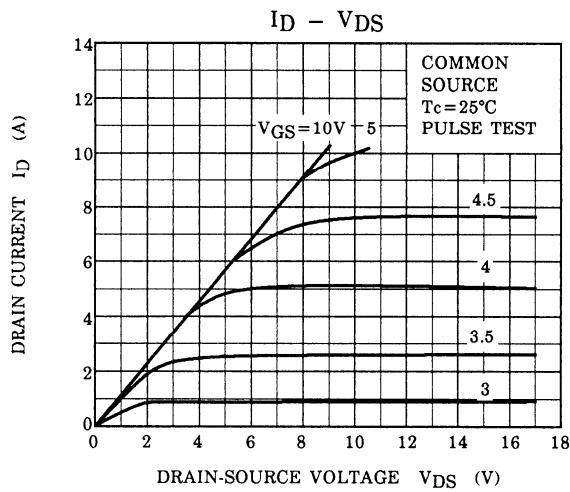


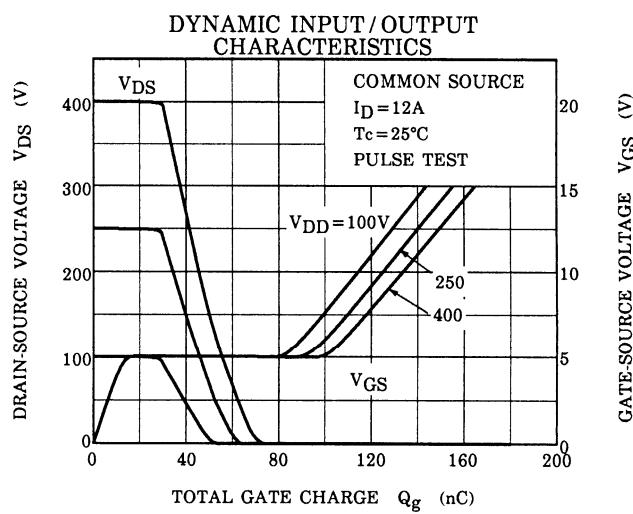
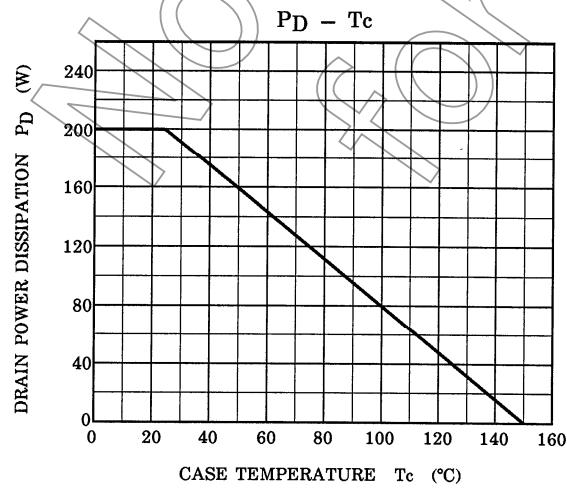
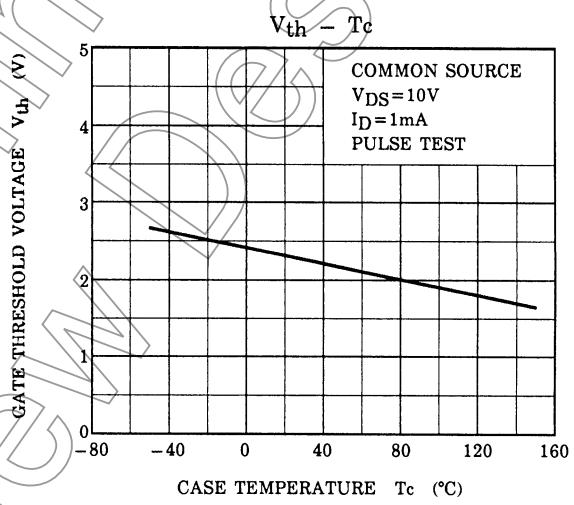
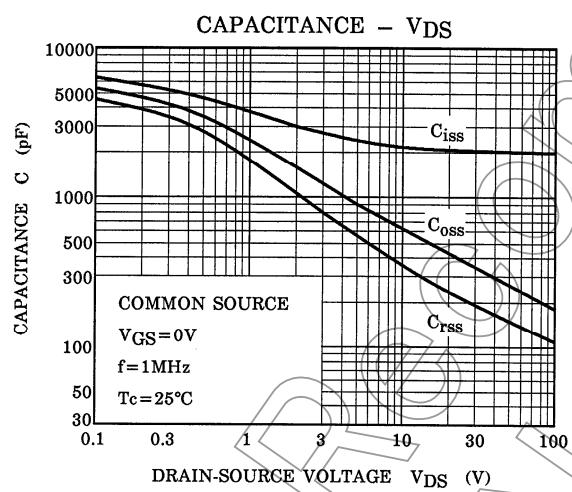
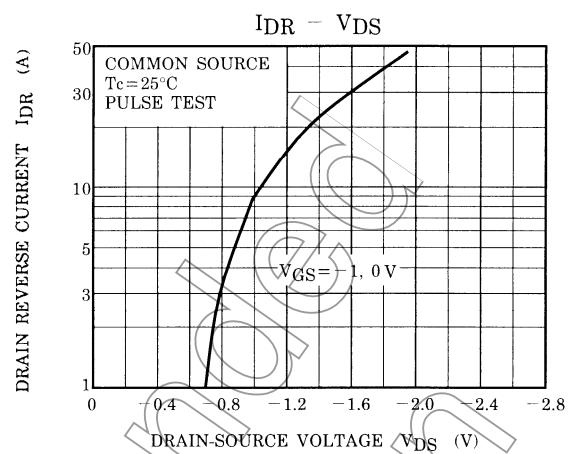
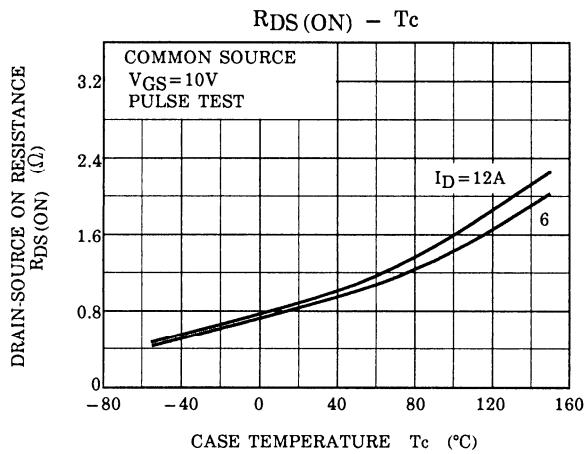
Note 2: A line under a Lot No. identifies the indication of product Labels.

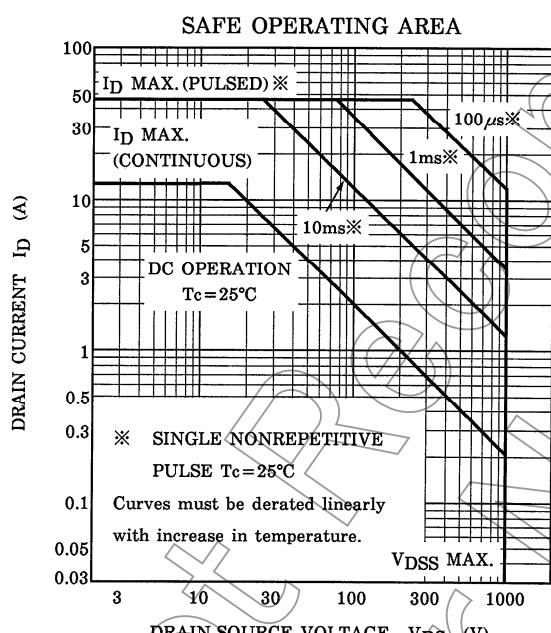
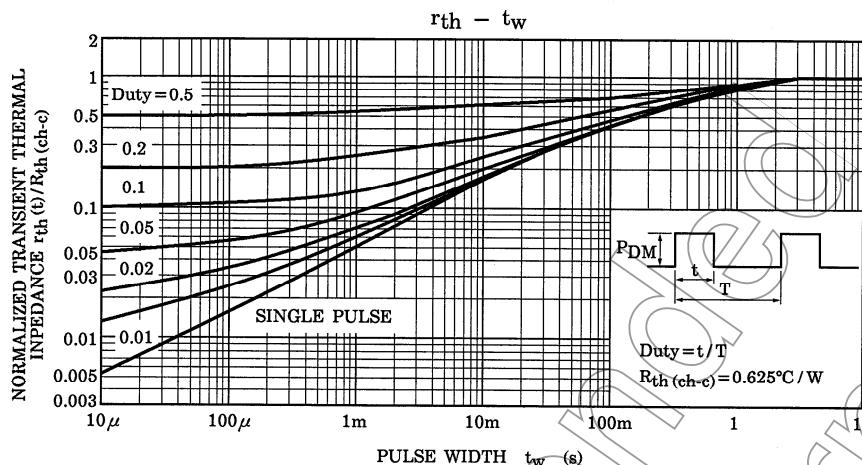
Not underlined: [[Pb]]/INCLUDES > MCV

Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

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