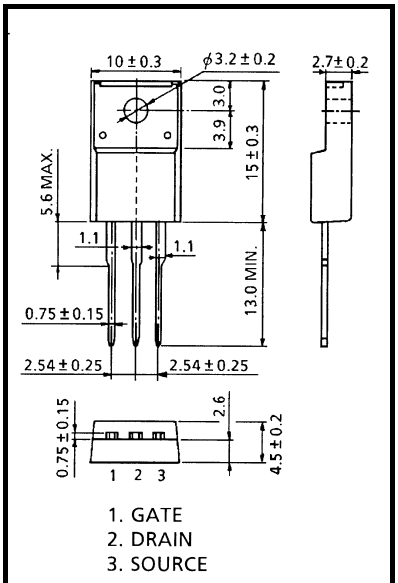
TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

2SK2013

Audio Frequency Power Amplifier Application

- High breakdown voltage : V_{DSS} = 180V
- High forward transfer admittance : $|Y_{fs}|$ = 0.7 S (typ.)
- Complementary to 2SJ313

Unit: mm



JEDEC	—
JEITA	SC−67
TOSHIBA	2-10R1B

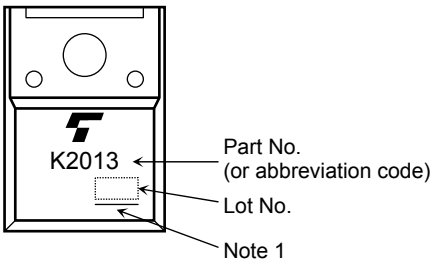
Weight: 1.9 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain−source voltage	V_{DSS}	180	V
Gate−source voltage	V_{GSS}	±20	V
Drain current (Note 2)	I_D	1	A
Drain power dissipation (Tc = 25°C)	P_D	25	W
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C

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).

Marking



Note 1: 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]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Electrical Characteristics (Ta = 25°C)

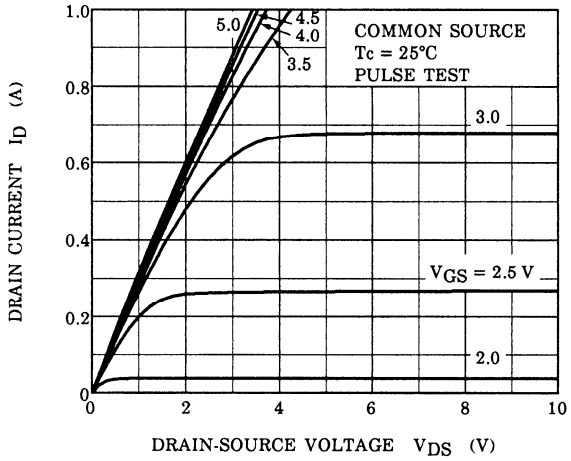
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	V_{DS} = 0, V_{GS} = ±20 V	—	—	±100	nA
Drain−source breakdown voltage	$V_{(BR)\ DSS}$	I_D = 10 mA, V_{GS} = 0	180	—	—	V
Gate−source cut−off voltage (Note 3)	$V_{GS\ (OFF)}$	V_{DS} = 10 V, I_D = 10 mA	1.8	—	2.8	V
Drain−source saturation voltage	$V_{DS\ (ON)}$	I_D = 0.6 A, V_{GS} = 10 V	—	1.7	3.0	V
Forward transfer admittance	$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 0.3 A	—	0.7	—	S
Input capacitance	C_{iss}	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz	—	170	—	pF
Output capacitance	C_{oss}	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz	—	45	—	
Reverse transfer capacitance	C_{rss}	V_{DD} ≈ 10 V, V_{GS} = 0, f = 1 MHz	—	17	—	

Note 2: Ensure that the channel temperature does not exceed 150°C.

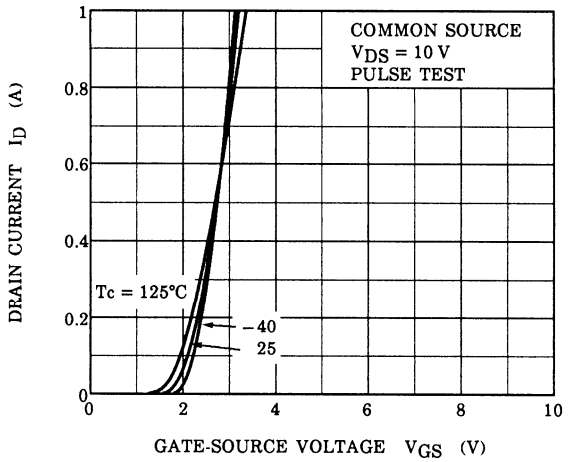
Note 3: $V_{GS\ (OFF)}$ Classification O: 0.8~1.6, Y: 1.4~2.8

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

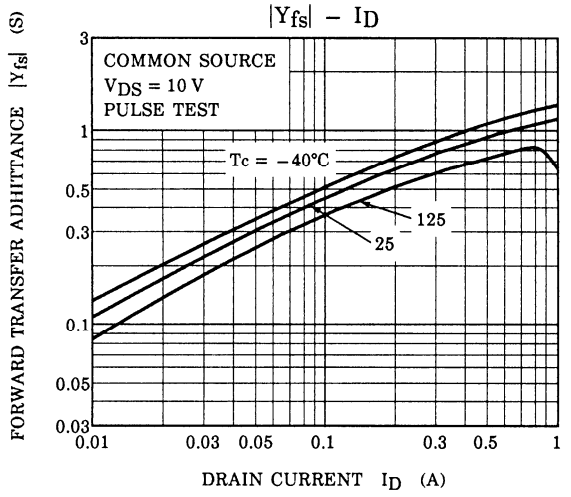
$I_D - V_{DS}$



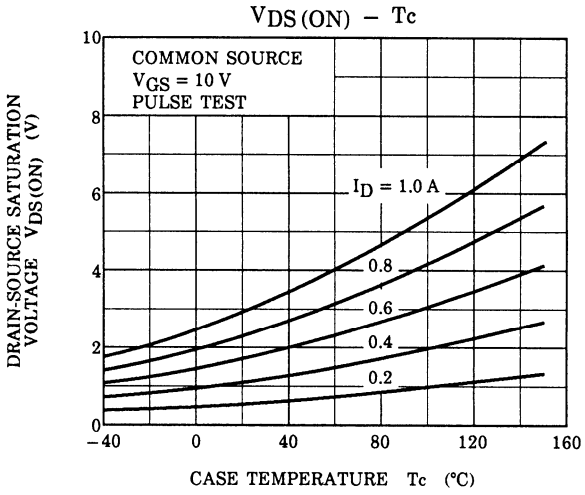
$I_D - V_{GS}$



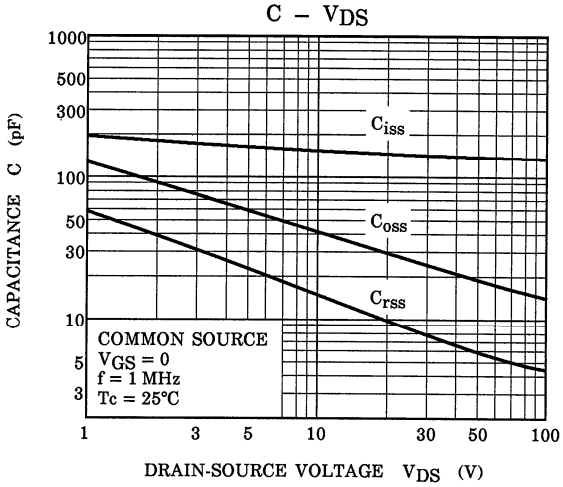
$|Y_{fs}| - I_D$



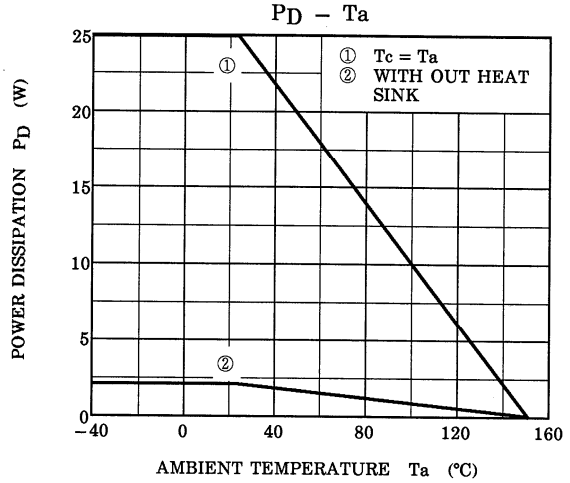
$V_{DS(ON)} - Tc$

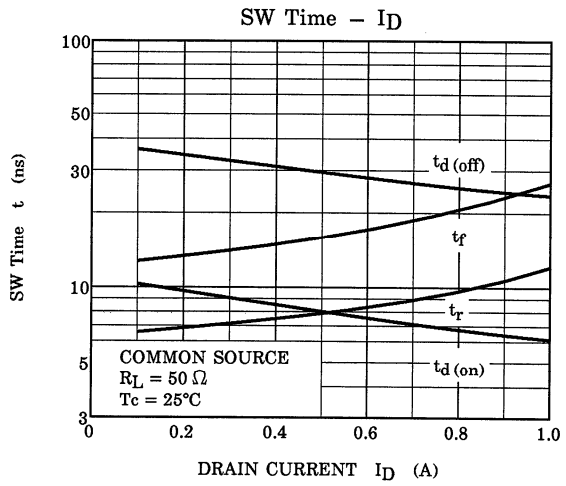


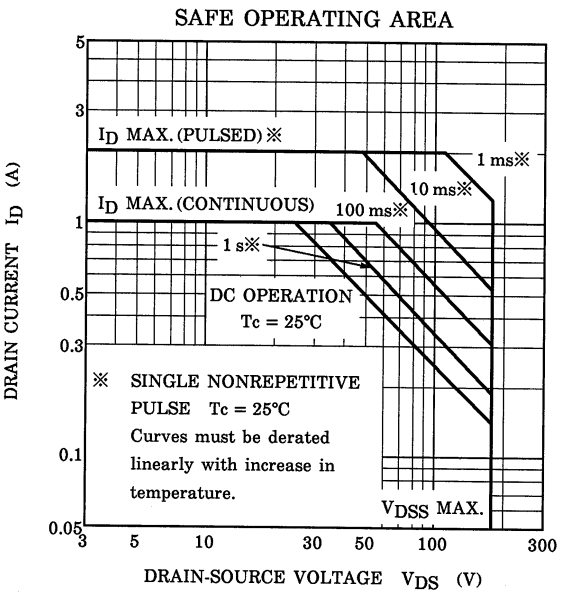
$C - V_{DS}$



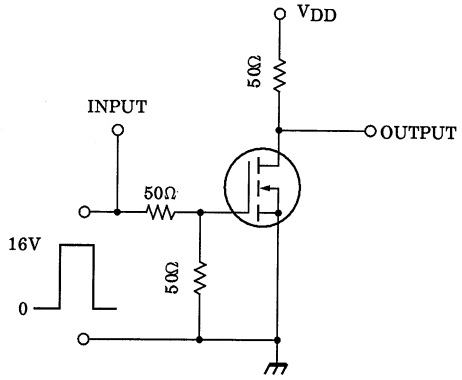
$P_D - Ta$



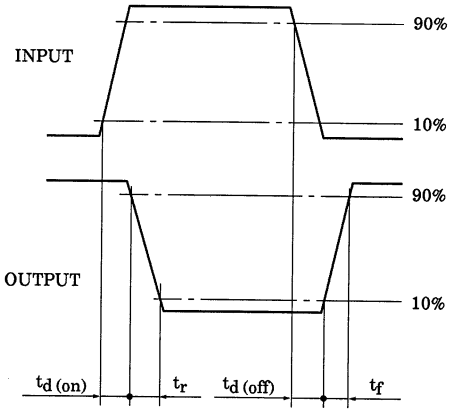




Switching Time Test Circuit



Waveforms



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