

TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

# TTK101MFV

For ECM

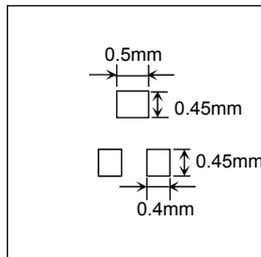
- Application for compact ECM

## Absolute Maximum Ratings (Ta=25°C)

Characteristic	Symbol	Rating	Unit
Gate-drain voltage	V <sub>GDO</sub>	-20	V
Gate current	I <sub>G</sub>	10	mA
Drain power dissipation	P <sub>D</sub> (Note 1)	150	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature range	T <sub>stg</sub>	-55 to 125	°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).

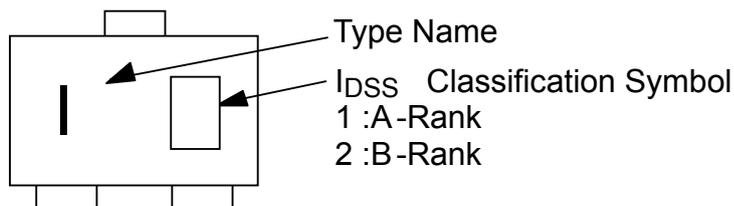
Note 1: Mounted on FR4 board (25.4 mm × 25.4 mm × 1.6 t)



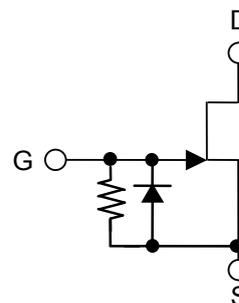
### I<sub>DSS</sub> CLASSIFICATION

- A-Rank 140 to 240 μA
- B-Rank 210 to 350 μA

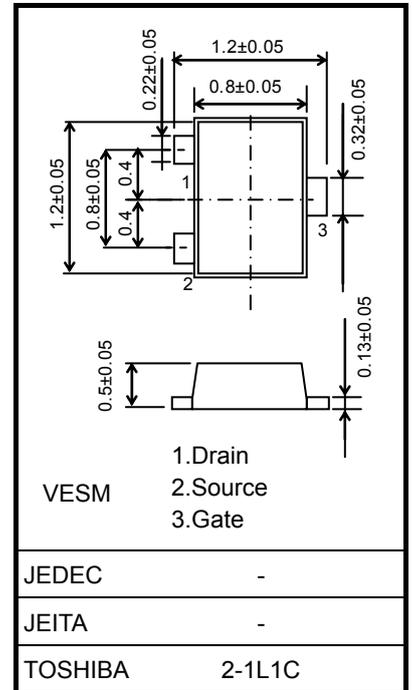
### Marking



### Equivalent Circuit



Unit: mm



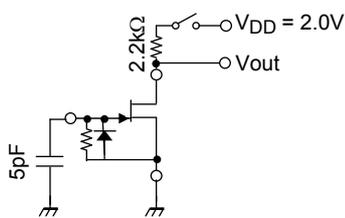
Weight: 1.5mg (typ.)

## Electrical Characteristics (Ta=25°C)

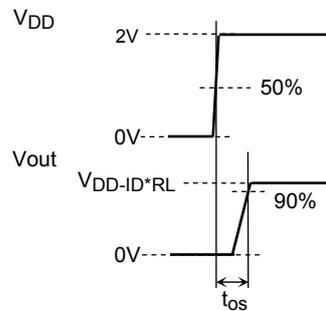
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 2 V, V <sub>GS</sub> = 0	A	140	—	240	μA
			B	210	—	350	
Drain current	I <sub>D</sub>	V <sub>DD</sub> = 2 V, R <sub>L</sub> = 2.2kΩ, C <sub>g</sub> = 5pF	A	125	—	260	μA
			B	190	—	370	
Gate-source cut-off voltage	V <sub>GS(OFF)</sub>	V <sub>DS</sub> = 2 V, I <sub>D</sub> = 1μA	-0.1	—	-1.0	V	
Forward transfer admittance	Y <sub>fs</sub>	V <sub>DS</sub> = 2 V, V <sub>GS</sub> = 0V	0.65	0.9	—	mS	
Gate-drain breakdown voltage	V <sub>(BR)GDO</sub>	I <sub>G</sub> = -10 μA	-20	—	—	V	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 2 V, V <sub>GS</sub> = 0, f = 1 MHz	—	1.8	—	pF	
Voltage gain	G <sub>v</sub>	V <sub>DD</sub> = 2V, R <sub>L</sub> = 2.2kΩ, C <sub>g</sub> = 5pF, f = 1kHz, v <sub>in</sub> = 100mV	A	-2.7	-1.3	—	dB
			B	-1.8	-0.6	—	
Delta voltage gain	DG <sub>v(f)</sub>	V <sub>DD</sub> = 2V, R <sub>L</sub> = 2.2kΩ, C <sub>g</sub> = 5pF, f = 1kHz to 100Hz, v <sub>in</sub> = 100mV	—	0	-1.0	dB	
Delta voltage gain	DG <sub>v(V)</sub>	V <sub>DD</sub> = 2 V to 1.5 V, R <sub>L</sub> = 2.2 kΩ, C <sub>g</sub> = 5pF, f = 1kHz, v <sub>in</sub> = 100mV	A	—	-0.7	-1.4	dB
			B	—	-1.4	-3.0	
Noise voltage	V <sub>N</sub>	V <sub>DD</sub> = 2 V, R <sub>L</sub> = 1 kΩ, C <sub>g</sub> = 10 pF, G <sub>v</sub> = 80 dB, A-Curve Filter	—	15	30	mV	
Total harmonic distortion	THD	V <sub>DD</sub> = 2 V, R <sub>L</sub> = 2.2kΩ, C <sub>g</sub> = 5 pF, f = 1kHz, v <sub>in</sub> = 50mV	A	—	1.1	—	%
			B	—	0.6	—	
Time output stability	t <sub>os</sub>	V <sub>DD</sub> = 2 V, R <sub>L</sub> = 2.2 kΩ, C <sub>g</sub> = 5 pF	—	20	50	ms	

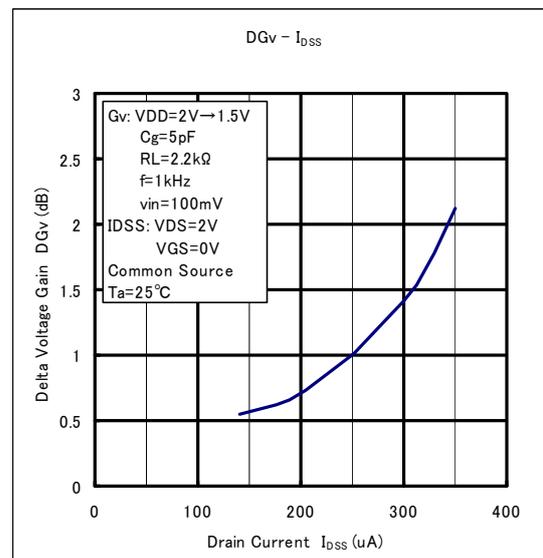
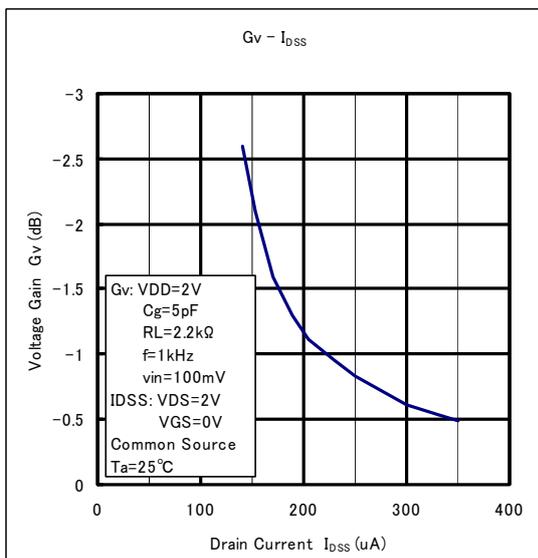
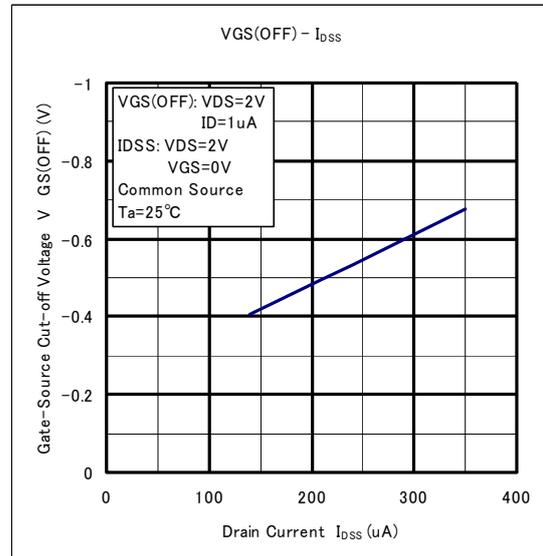
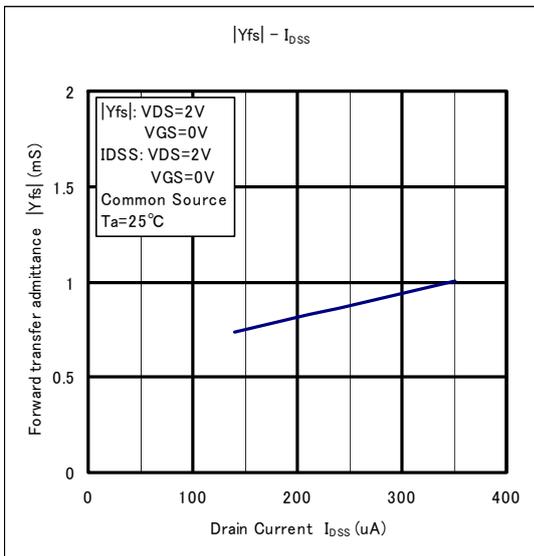
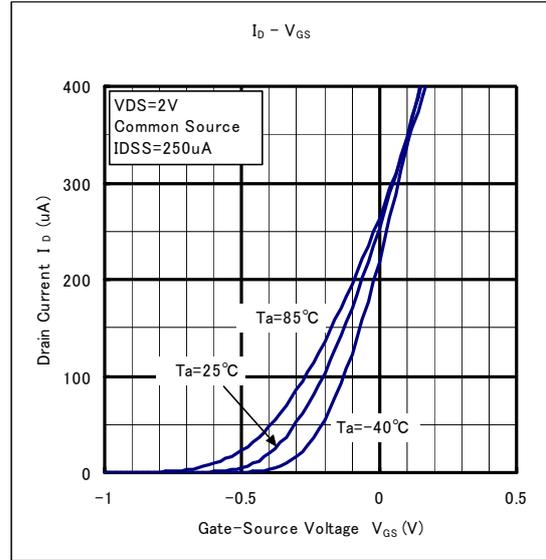
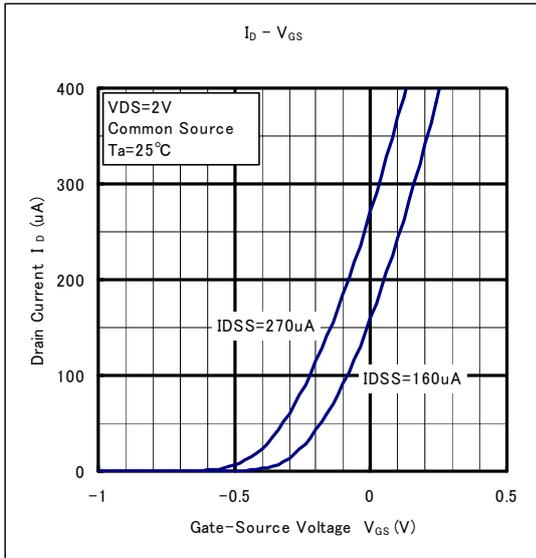
## Time Output Stability Test Method

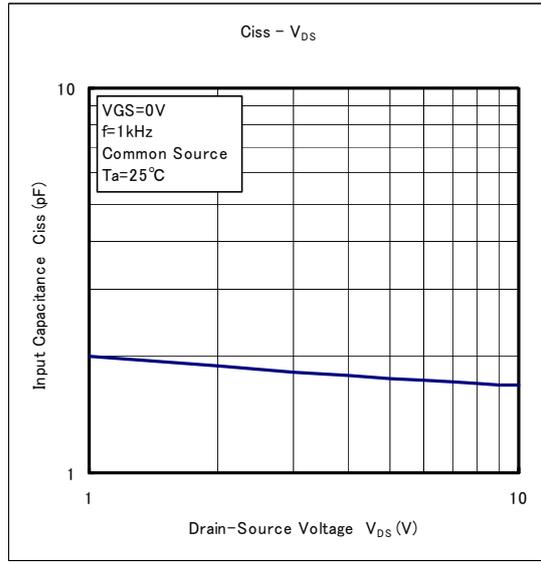
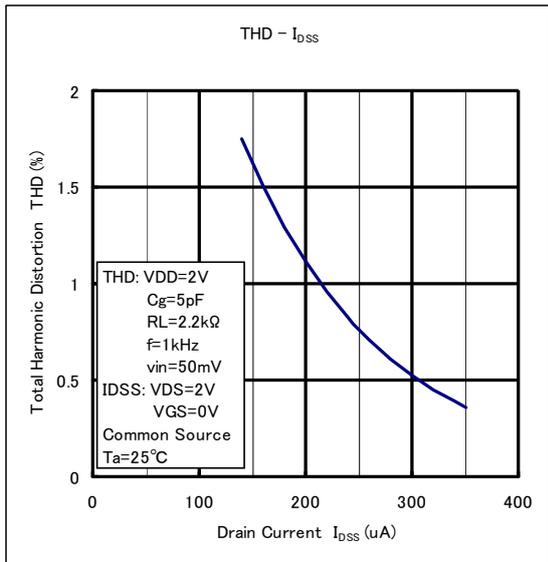
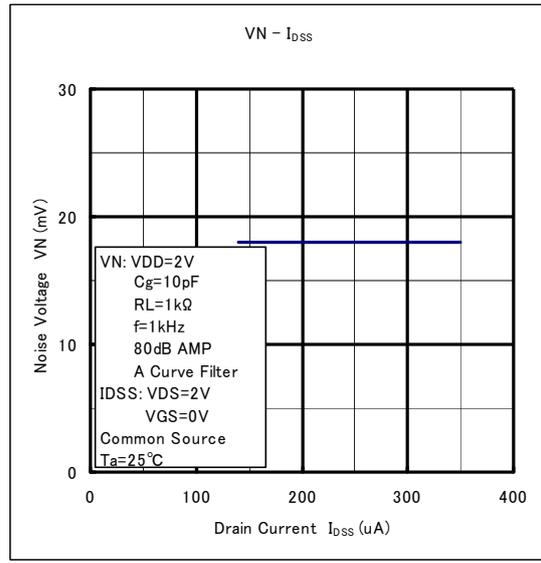
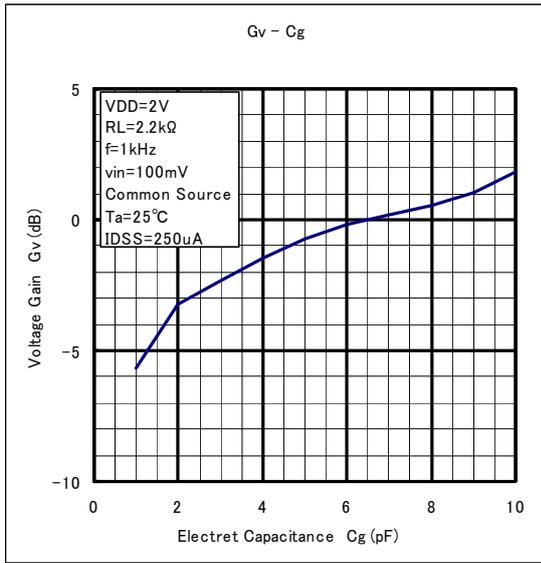
### a) TEST CIRCUIT



### b) TEST SIGNAL







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