TOSHIBA Field Effect Transistor Silicon N Channel Junction Type

2SK3857TK

For ECM

Application for Ultra-compact ECM

Absolute Maximum Ratings (Ta=25°C)

Characteristic	Symbol	Rating	Unit	
Gate-Drain voltage	V _{GDO}	-20	V	
Gate Current	IG	10	mA	
Drain power dissipation (Ta = 25°C)	PD	100	mW	
Junction Temperature	Тj	125	°C	
Storage temperature range	T _{stg}	-55~125	°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.

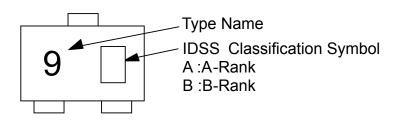
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling

Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

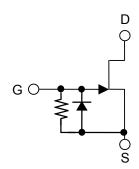
IDSS CLASSIFICATION

A-Rank	140~240µA
B-Rank	210~350µA

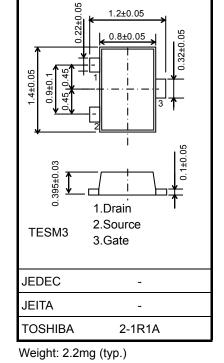
Marking



Equivalent Circuit







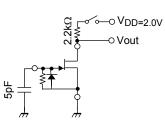
Electrical Characteristics (Ta=25°C)

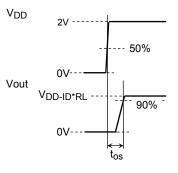
Characteristic	Symbol	Test Condition	Min	Тур.	Max	Unit
Drain Current	I _{DSS}	$V_{DS} = 2 \text{ V}, V_{GS} = 0$	140		350	μA
Drain Current	I _D	$V_{DD} = 2 \text{ V}, \text{ RL}= 2.2 k\Omega, \text{Cg} = 5 \text{pF}$	_	_	370	μA
Gate-Source Cut-off Voltage	V _{GS(OFF)}	$V_{DS} = 2 V, I_D = 1 \mu A$	-0.1	_	-1.0	V
Forward transfer admittance	Y _{fs}	$V_{DS} = 2 V, V_{GS} = 0V$	0.9	1.3	_	mS
Gate-Drain Voltage	V _{(BR)GDO}	IG=-10μA	-20	_	_	V
Input capacitance	C _{iss}	$V_{DS} = 2 \text{ V}, V_{GS} = 0, \text{f} = 1 \text{MHz}$	_	3.5	_	pF
Voltage Gain	Gv	$V_{DD} = 2V$, RL= 2.2k Ω ,Cg = 5pF, f = 1kHz,vin=100mV	-3.0	-0.5		dB
Delta Voltage Gain	DGv(f)	$V_{DD} = 2V$, RL= 2.2k Ω , Cg = 5pF, f = 1kHz to 100Hz, vin=100mV		0	-1	dB
Delta Voltage Gain	DGv(V)	V_{DD} = 2V to 1.5V, RL= 2.2k Ω ,Cg = 5pF,f = 1kHz, vin=100mV	_	-0.8	-2	dB
Noise Voltage	VN	$V_{DD} = 2V$, RL= 1k Ω ,Cg = 10pF,Gv=80dB, A-Curve Filter		25	55	mV
Total Harmonic Distortion	THD	$V_{DD} = 2V$, RL= 2.2k Ω ,Cg = 5pF, f = 1kHz, vin=50mV	_	0.7		%
Time Output Stability	tos	$V_{DD} = 2V, RL= 2.2k\Omega, Cg = 5pF$	_	100	200	ms

Time Output Stability Test Method

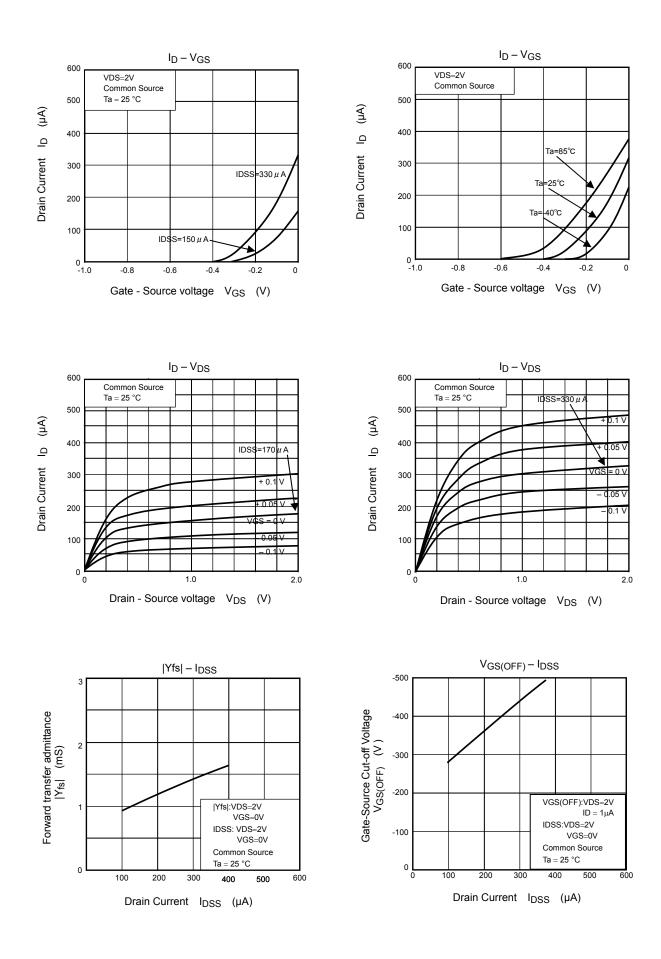
a) TEST CIRCUIT

b) TEST SIGNAL

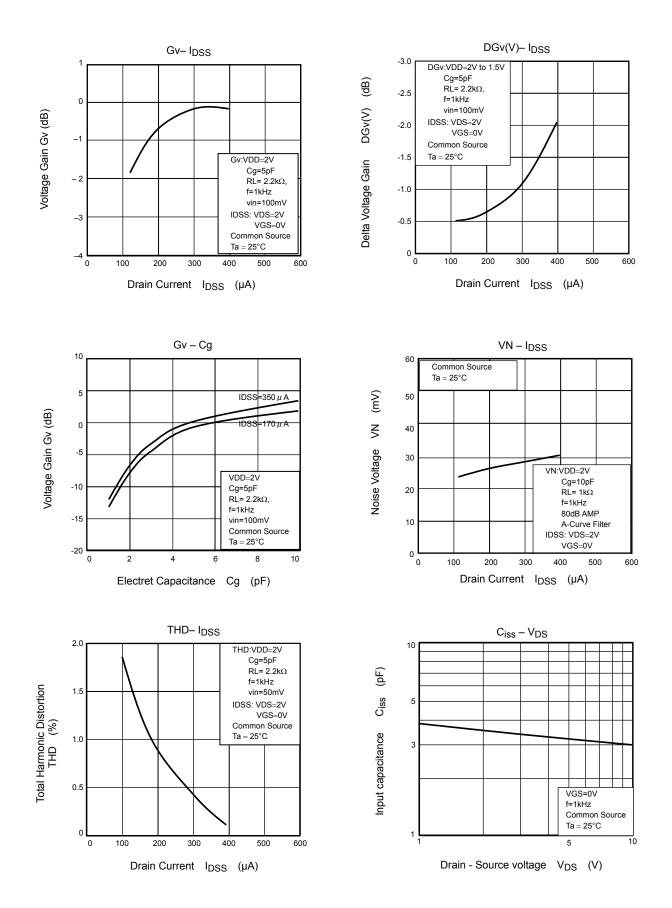




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