Ordering number : ENA0944

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-channel Silicon Juncton FET

2SK596S — Electret Condenser Microphone Applications

Features

- Low output noise voltage : V_{NO}=–110dB max (V_{CC}=4.5V, R_L=1kΩ, Cin=15pF, V_{IN}=0V, A curve)
- Especiallysuited for use in condenser microphone for audio equipments and telephones
- Excellent transient characteristic
- Adoption of FBET process

Specifications

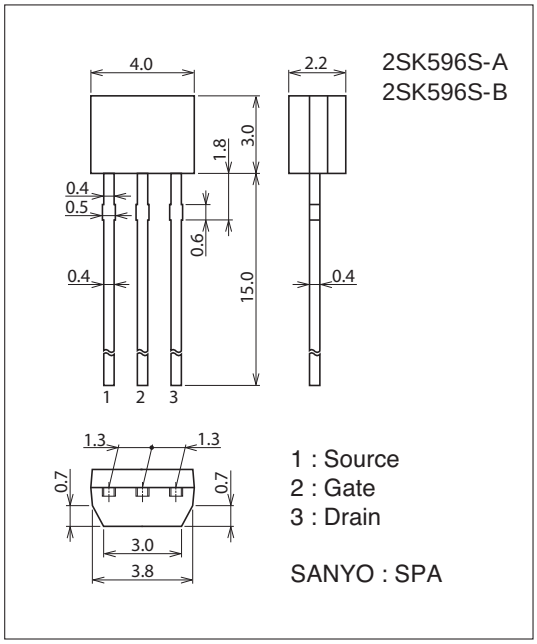
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Gate-to-Drain Voltage	V_{GDO}		–20	V
Gate Current	I_G		10	mA
Drain Current	I_D		1	mA
Allowable Power Dissipation	P_D		100	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		–55 to +150	°C

Package Dimensions

unit : mm (typ)

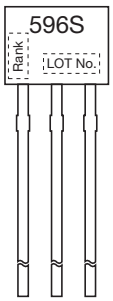
7524-005



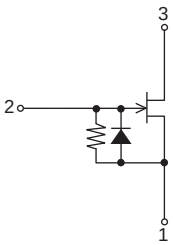
Product & Package Information

- Package : SPA
- JEITA, JEDEC : SC-72
- Minimum Packing Quantity : 500 pcs./bag

Marking



Electrical Connection



Electrical Characteristics at Ta=25°C

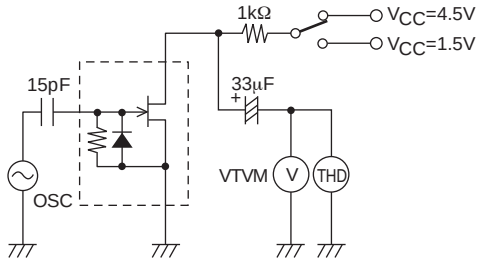
Parameter	Symbol	Conditions	Ratings				Unit
			Rank	min	typ	max	
Gate-to-Drain Breakdown Voltage	$V_{(BR)GDO}$	I_G=−100μA		−20			V
Cutoff Voltage	V_{GS}(off)	V_{DS}=5V, I_D=1μA			−0.4	−1.5	V
Drain Current	I_{DSS}*	V_{DS}=5V, V_{GS}=0V	A	100		170	μA
			B	150		240	
Forward Transfer Admittance	| yfs |	V_{DS}=5V, V_{GS}=0V, f=1kHz		0.4	0.8		mS
Input Capacitance	Ciss	V_{DS}=5V, V_{GS}=0V, f=1MHz			4.1		pF
Reverse Transfer Capacitance	Crss	V_{DS}=5V, V_{GS}=0V, f=1MHz			0.88		pF
[Ta=25℃, V_{CC}=4.5V, R_L=1kΩ, Cin=15pF, See specified Test Circuit.]							
Voltage Gain	G_V	V_{IN}=10mV, f=1kHz	A		−5.0		dB
			B		−3.8		
Reduced Voltage Characteristic	ΔG_{VV}	V_{IN}=10mV, f=1kHz, V_{CC}=4.5V → 1.5V	A		−0.84	−1.8	dB
			B		−0.90	−2.0	
Frequency Characteristic	ΔGvf	f=1kHz → 110Hz				−1.0	dB
Total Harmonic Distortion	THD	V_{IN}=30mV, f=1kHz	A		2.0		%
			B		1.6		
Output Noise Voltage	V_{NO}	V_{IN}=0V, A curve				−110	dB

* : The 2SK596S is classified by I_{DSS} as follows : (unit : μA)

Rank	A	B
I_{DSS}	100 to 170	150 to 240

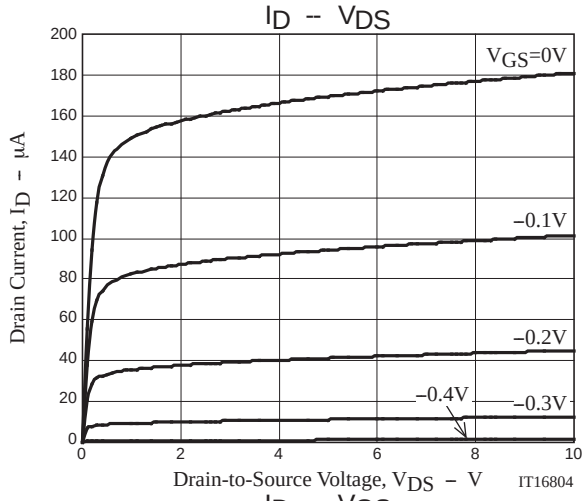
Test Circuit

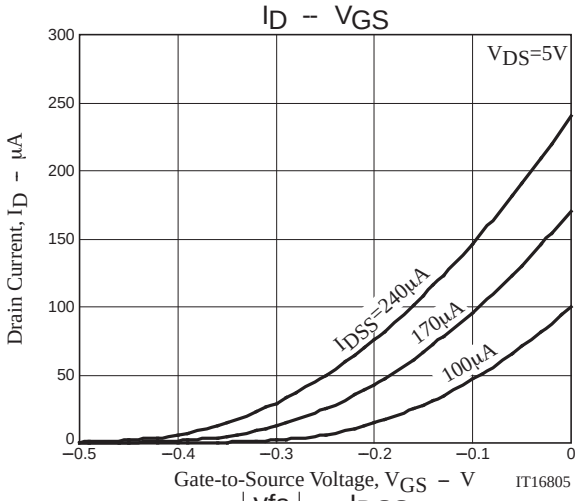
Voltage Gain
Frequency Characteristic
Harmonic Distortion
Reduced Voltage Characteristic

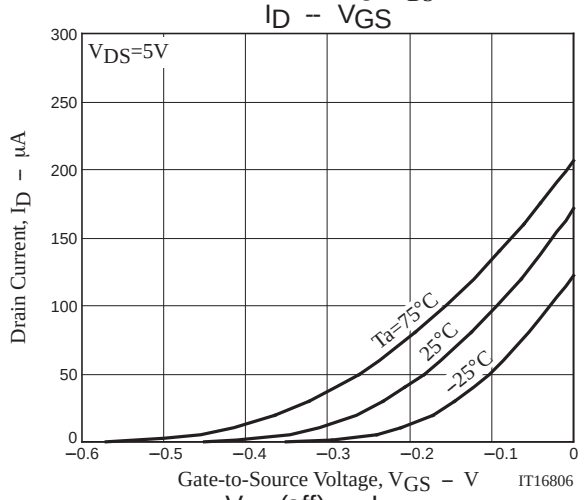


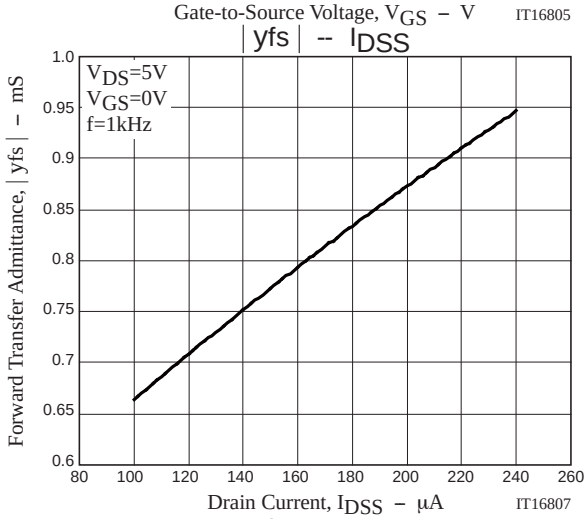
Ordering Information

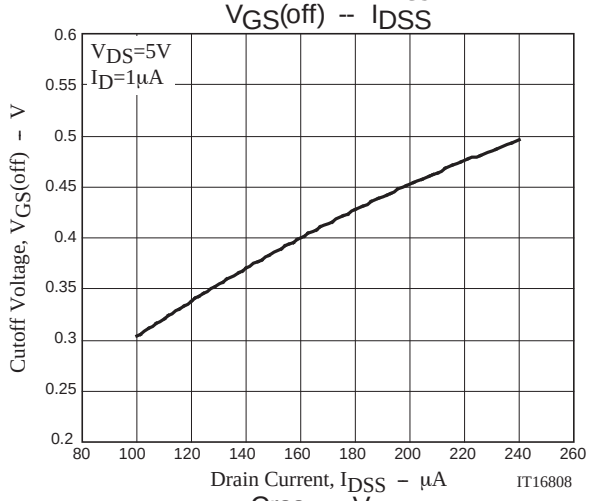
Device	Package	Shipping	memo
2SK596S-A	SPA	500pcs./bag	Pb Free
2SK596S-B	SPA	500pcs./bag	

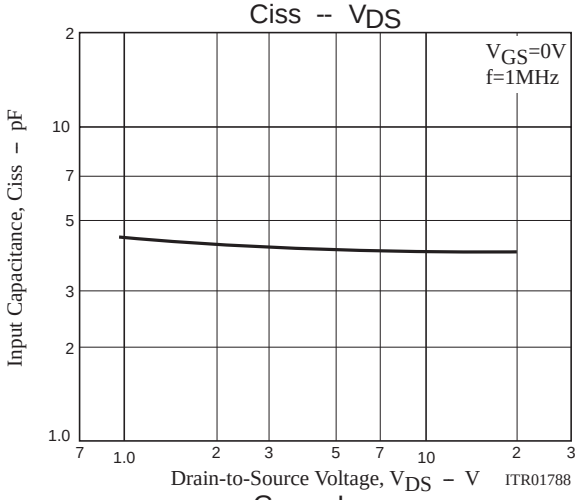

ID -- VDS
VGS=0V
–0.1V
–0.2V
–0.3V
–0.4V
Drain Current, ID – µA
Drain-to-Source Voltage, VDS – V
IT16804

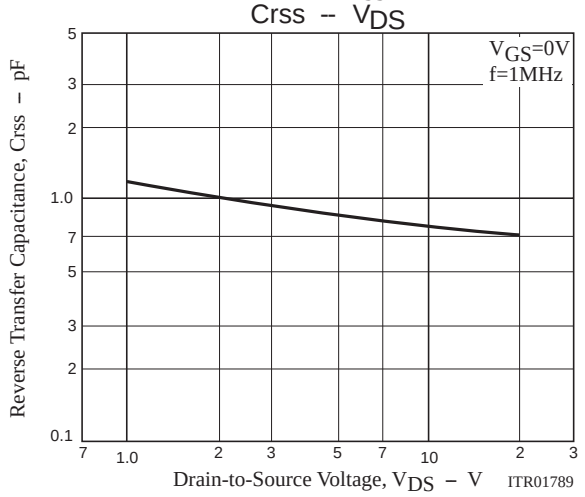

ID -- VGS
VDS=5V
IDSS=240µA
170µA
100µA
Drain Current, ID – µA
Gate-to-Source Voltage, VGS – V
IT16805

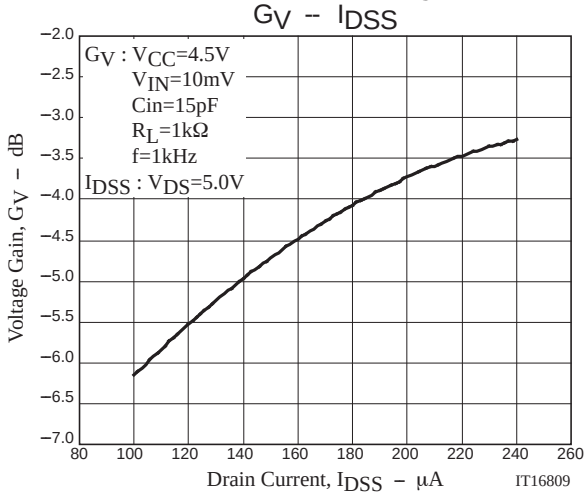

ID -- VGS
VDS=5V
Ta=75°C
25°C
–25°C
Drain Current, ID – µA
Gate-to-Source Voltage, VGS – V
IT16806

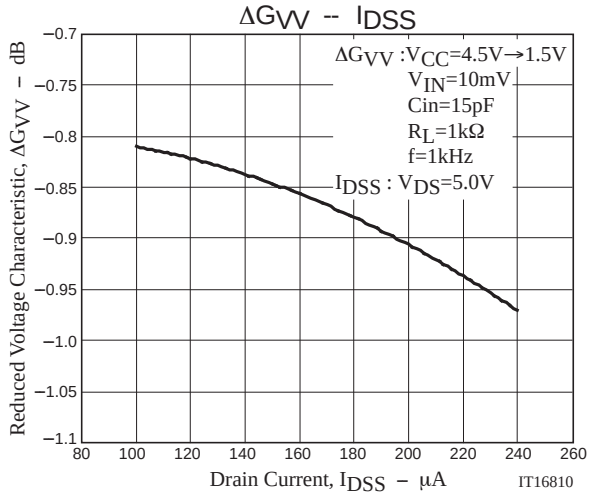

| yfs | -- IDSS
VDS=5V
VGS=0V
f=1kHz
Forward Transfer Admittance, | yfs | – mS
Drain Current, IDSS – µA
IT16807

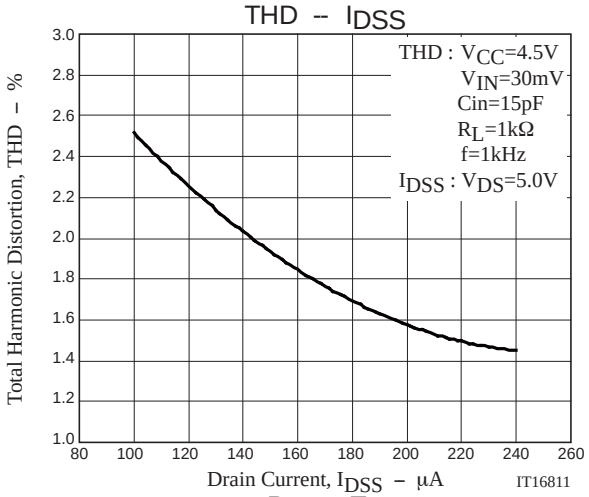

VGS(off) -- IDSS
VDS=5V
ID=1µA
Cutoff Voltage, VGS(off) – V
Drain Current, IDSS – µA
IT16808

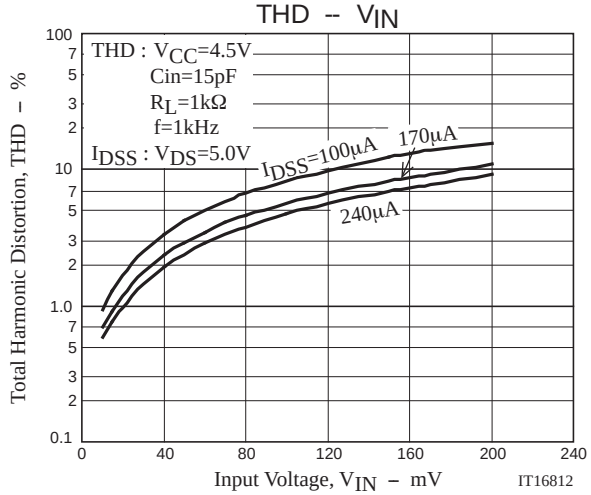

Ciss -- VDS
VGS=0V
f=1MHz
Input Capacitance, Ciss – pF
Drain-to-Source Voltage, VDS – V
ITR01788

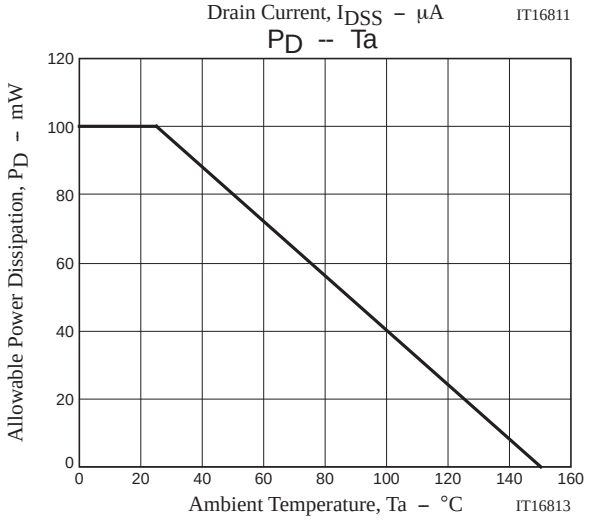

Crss -- VDS
VGS=0V
f=1MHz
Reverse Transfer Capacitance, Crss – pF
Drain-to-Source Voltage, VDS – V
ITR01789


GV -- IDSS
GV : VCC=4.5V
VIN=10mV
Cin=15pF
RL=1kΩ
f=1kHz
IDSS : VDS=5.0V
Voltage Gain, GV – dB
Drain Current, IDSS – µA
IT16809


ΔGVV -- IDSS
ΔGVV :VCC=4.5V→1.5V
VIN=10mV
Cin=15pF
RL=1kΩ
f=1kHz
IDSS : VDS=5.0V
Reduced Voltage Characteristic, ΔGVV – dB
Drain Current, IDSS – μA
IT16810


THD -- IDSS
THD : VCC=4.5V
VIN=30mV
Cin=15pF
RL=1kΩ
f=1kHz
IDSS : VDS=5.0V
Total Harmonic Distortion, THD – %
Drain Current, IDSS – μA
IT16811


THD -- VIN
THD : VCC=4.5V
Cin=15pF
RL=1kΩ
f=1kHz
IDSS : VDS=5.0V
IDSS=100μA
170μA
240μA
Total Harmonic Distortion, THD – %
Input Voltage, VIN – mV
IT16812


PD -- Ta
Allowable Power Dissipation, PD – mW
Ambient Temperature, Ta – °C
IT16813

Bag Packing Specification

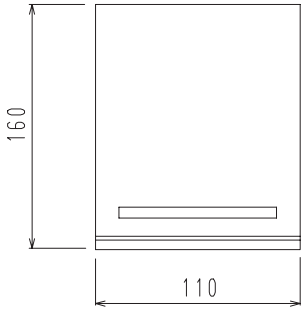
2SK596S-A, 2SK596S-B

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)				
	Bag	Inner BOX		Outer BOX	
SPA	500	B-1	B-1/2	A-1	A-2
		20,000	10,000	100,000	60,000
		Packing format (Dimensions: mm (external))			
		Inner BOX		Outer BOX	
		B-1	B-1/2	A-1	A-2
		445×225×55	445×225×55	470×250×300	470×250×190

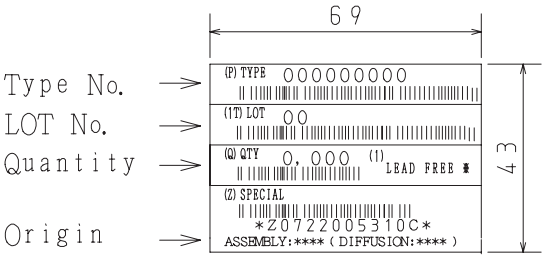
2. Bag dimensions

(unit: mm)



3. Bag label, Inner box label

(unit: mm)



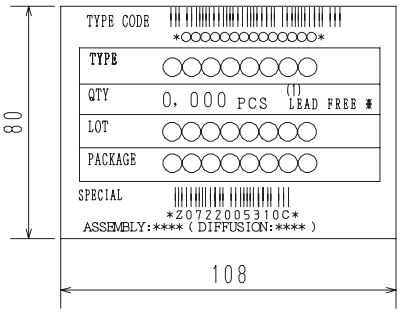
NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A
LEAD FREE 4	JEITA Phase 3

4. Outer box label

(unit: mm)

It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.



Outline Drawing

2SK596S-A, 2SK596S-B