INKE211AC1-T150

Built-in Zener Diode
MOS field-effect transistor
Silicon N-channel

AEC-Q101 Compliance

DESCRIPTION

INKE211AC1 is a silicon N-channel MOS transistors with built-in Zener diode between drain and source, and small package (SC-59).

FEATURE

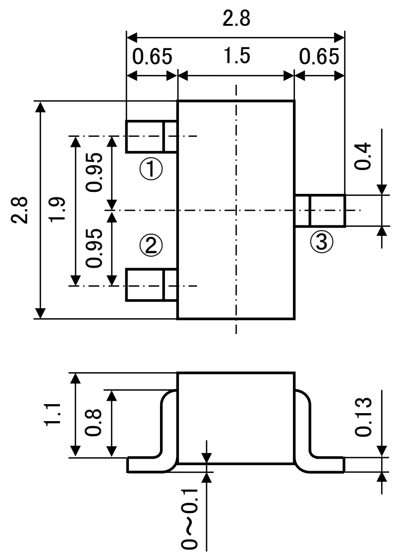
- ・Low on Resistance.
  $R_{DS(ON)}$=250mΩ (TYP) @I_D=500mA,V_{GS}=4.5V
  $R_{DS(ON)}$=200mΩ (TYP) @I_D=500mA,V_{GS}=10V
- ・High speed switching.
- ・Drive voltage 4V
- ・Built-in Zener diode between drain and source.
- ・Large avalanche resistance.
- ・Small package for High-density packaging.

APPLICATION

Motor drive, High-speed switching
Analog switching, and others.

OUTLINE DRAWING

UNIT : mm



TERMINAL CONNECTER
①: GATE
②: SOURCE
③: DRAIN

JEITA : SC-59
JEDEC : Similar to TO-236

MAXIMUM RATINGS (Ta=25℃)

Symbol	Parameter	Rating	Unit
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Drain Current(DC)	1	A
I_{DP}	Drain Current(Pulse) ※1	2	A
P_D	Total Power Dissipation	200	mW
		550 (※2)	mW
I_{AV}	Avalanche Current ※3,※4	1.0	A
E_{AV}	Avalanche Energy ※3,※4	0.06	mJ
T_{ch}	Channel Temperature	+150	℃
T_{stg}	Storage Temperature	-55～+150	℃

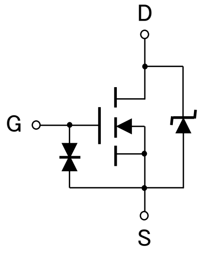
※1 : P_W≦1ms, Duty≦1%

※2 : Package mounted on glass-epoxy substrate (20mm×20mm×1mm, Cu pad 100mm^2)

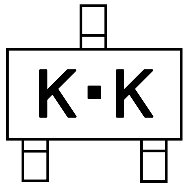
※3 : Consecutive pulses P_W≦20μs, Duty≦0.2%

※4 : L=100μH

EQUIVALENT CIRCUIT



MARKING



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Built-in Zener Diode
MOS field-effect transistor
Silicon N-channel

【MOSFET】ELECTRICAL CHARACTERISTICS (Ta=25℃)

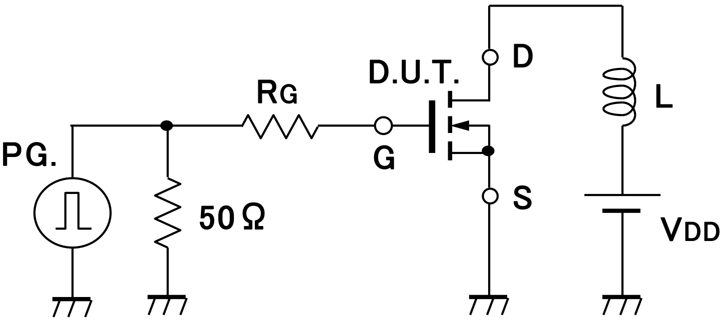
Symbol	Parameter	Test Condition	Limit			Unit
			MIN.	TYP.	MAX.	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D=100μA, V_{GS}=0V	40	−	60	V
I_{GSS}	Gate-Source Leak current	V_{GS}=±20V, V_{DS}=0V	−	−	±10	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V	−	−	1	μA
V_{th}	Gate Threshold Voltage	I_D=250μA, V_{DS}=V_{GS}	1.0	−	2.0	V
$\|Y_{fs}\|$	Forward Transfer Admittance	V_{DS}=10V, I_D=500mA	−	1.5	−	S
$R_{DS(ON)}$	Static Drain-Source On-State Resistance	I_D=500mA, V_{GS}=4.5V	−	250	−	mΩ
		I_D=500mA, V_{GS}=10V	−	200	−	
C_{iss}	Input Capacitance	V_{DS}=5V, V_{GS}=0V, f=1MHz	−	170	−	pF
C_{oss}	Output Capacitance		−	40	−	
t_{on}	Switching Time	V_{DD}=5V, I_D=250mA V_{GS}=0～5V	−	170	−	ns
t_{off}			−	85	−	

【Zener Diode】ELECTRICAL CHARACTERISTICS (Ta=25℃)

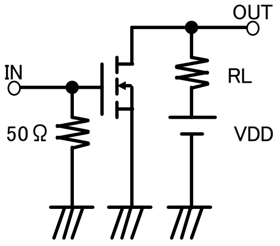
Zener Voltage Vz(V)			Reverse current I_R(μA)	
MIN	MAX	I_Z(mA)	MAX	V_R(V)
40	60	0.1	1.0	40

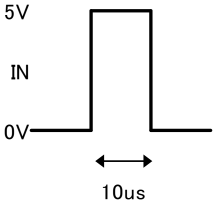
Avalanche current test condition

Ta=25°C
RG=25Ω
VDD=20V
VGS=10→0V

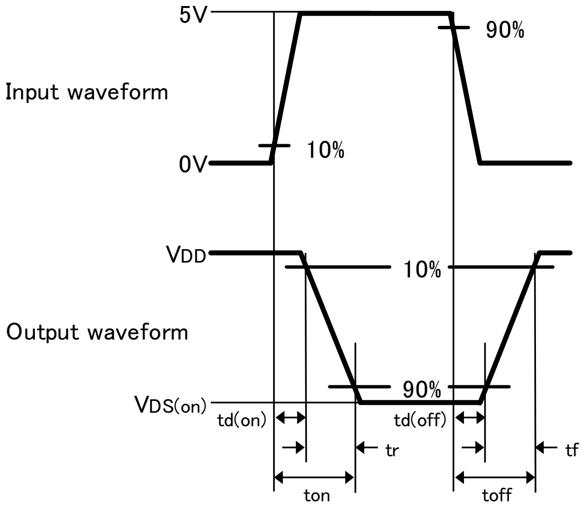


Switching time test condition

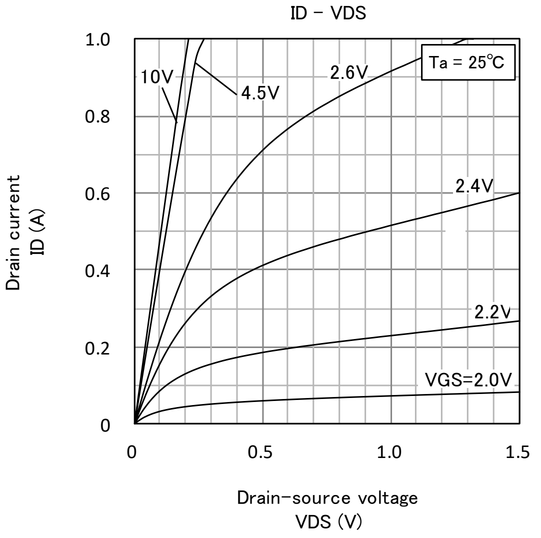


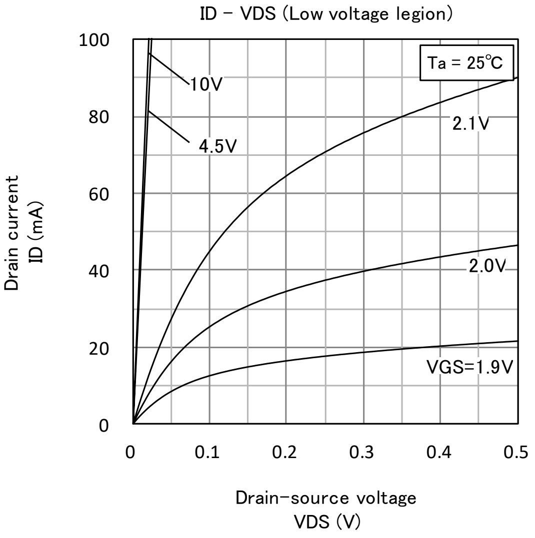


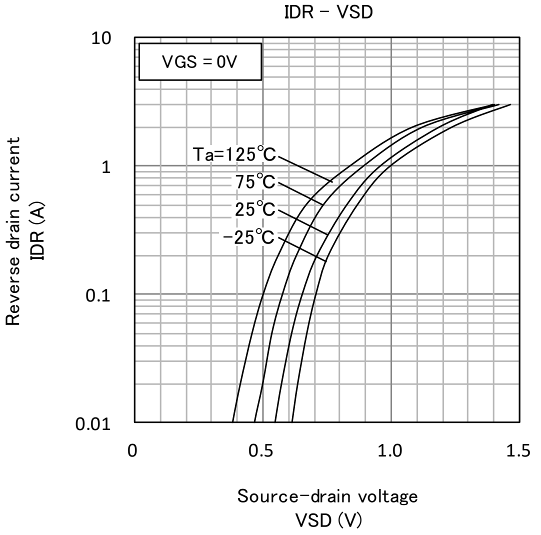
Duty ≦ 1%
Input：tr, tf ＜ 10ns
VDD = 5V
Common source
Ta = 25℃

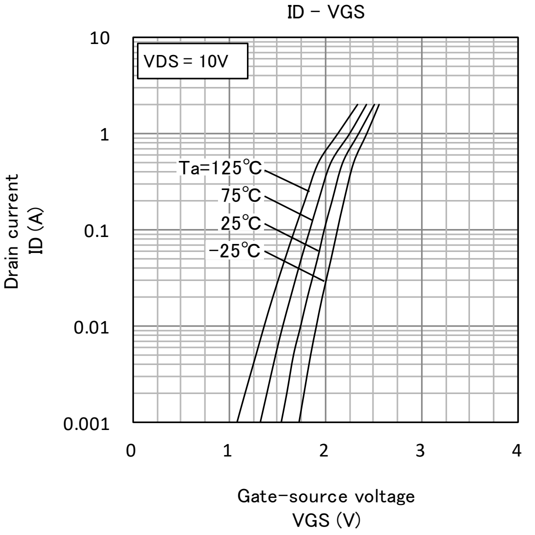


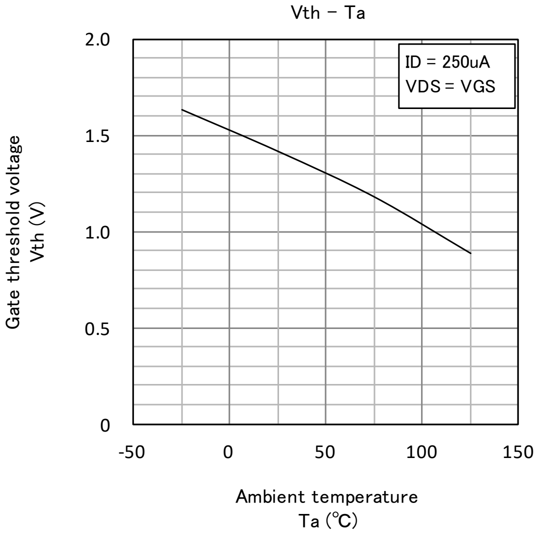
TYPICAL CHARACTERISTICS

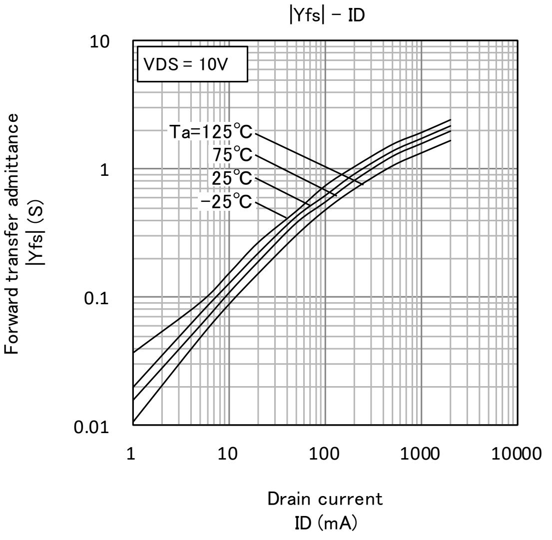




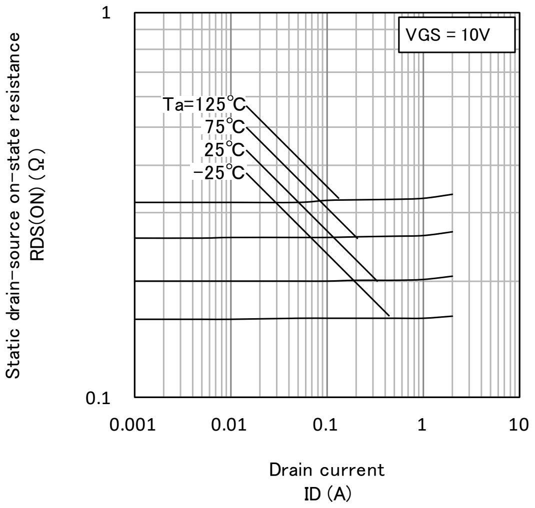




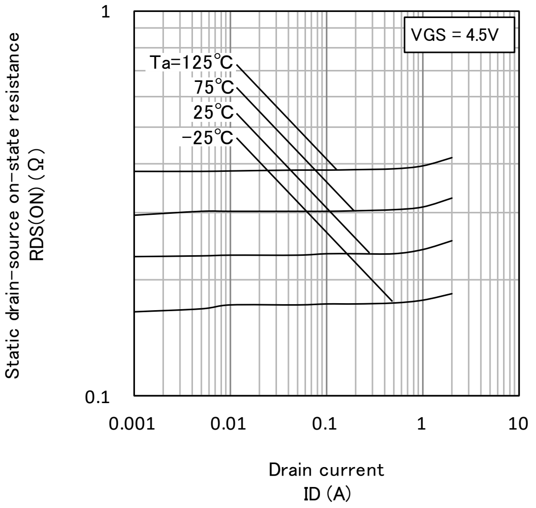




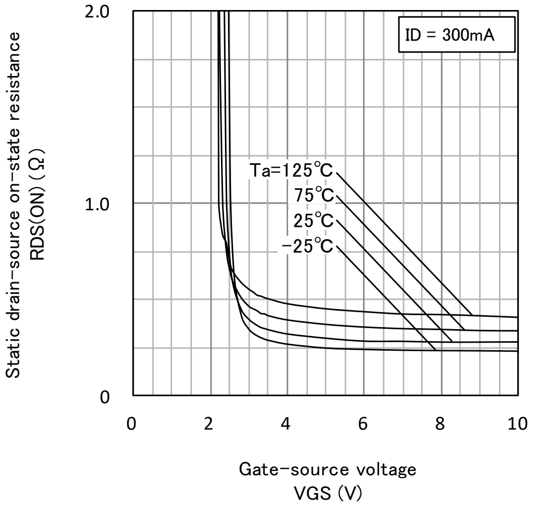
RDS(ON) - ID



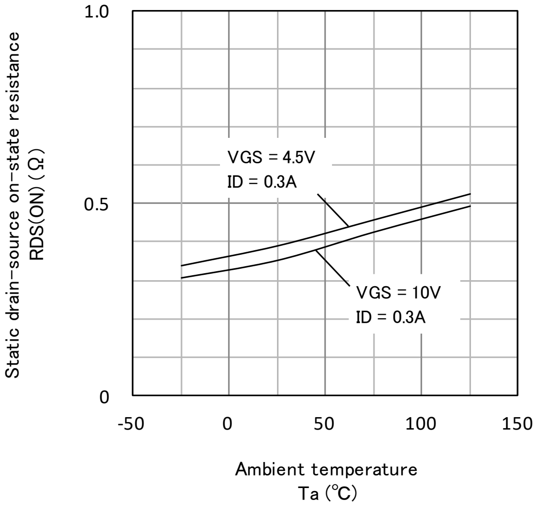
RDS(ON) - ID



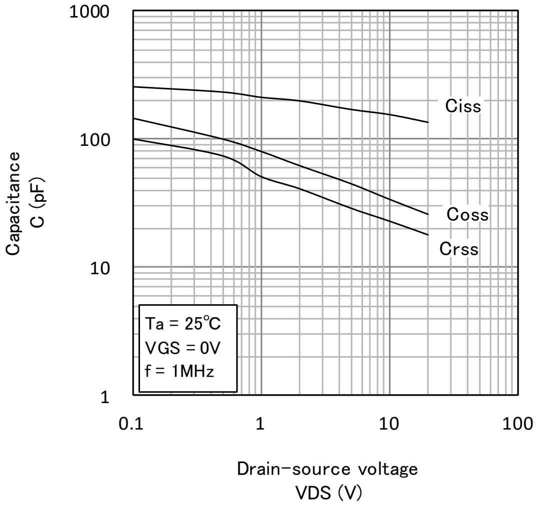
RDS(ON) - VGS



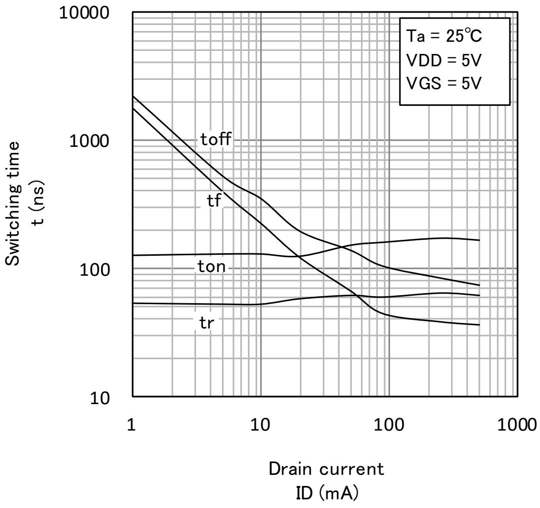
RDS(ON) - VGS

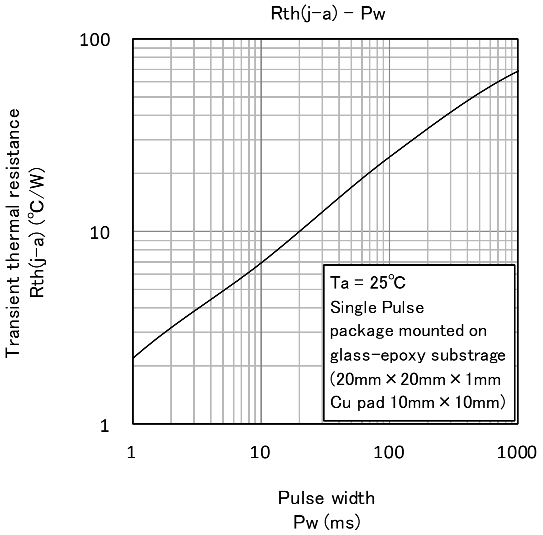


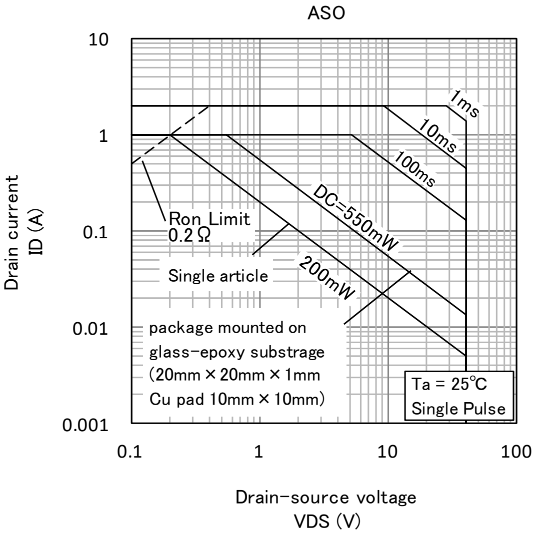
C - VDS

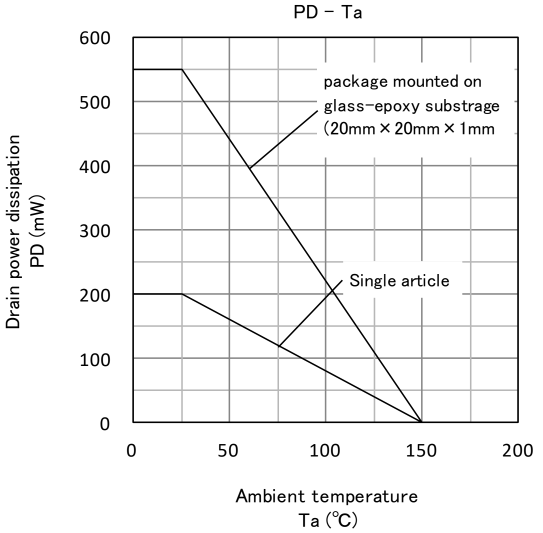


t - ID




Rth(j-a) - Pw
Transient thermal resistance
Rth(j-a) (℃/W)
100
10
1
1
10
100
1000
Pulse width
Pw (ms)
Ta = 25℃
Single Pulse
package mounted on
glass-epoxy substrage
(20mm × 20mm × 1mm
Cu pad 10mm × 10mm)


ASO
Drain current
ID (A)
10
1
0.1
0.01
0.001
0.1
1
10
100
Drain-source voltage
VDS (V)
1ms
10ms
100ms
DC=550mW
200mW
Ron Limit
0.2Ω
Single article
package mounted on
glass-epoxy substrage
(20mm × 20mm × 1mm
Cu pad 10mm × 10mm)
Ta = 25℃
Single Pulse


PD - Ta
Drain power dissipation
PD (mW)
600
500
400
300
200
100
0
0
50
100
150
200
Ambient temperature
Ta (℃)
package mounted on
glass-epoxy substrage
(20mm × 20mm × 1mm
Single article

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