INKE211BP1

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

DESCRIPTION

INKE211BP1 is a silicon N-channel MOS transistors with built-in Zener diode , and small package.

FEATURE

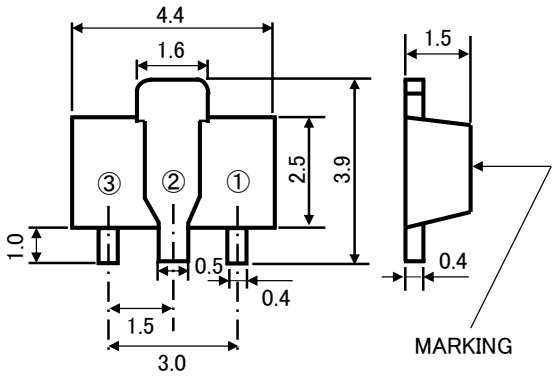
・Low on Resistance.
  $R_{DS(ON)}$=340mΩ (TYP) @I_D=2.0A, V_{GS}=4.5V
  $R_{DS(ON)}$=260mΩ (TYP) @I_D=2.0A, V_{GS}=10V
・Drive voltage 4V
・Built-in Zener diode between drain and source.
・High avalanche resistance.
・Small package for High-density packaging.

APPLICATION

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

OUTLINE DRAWING

UNIT : mm



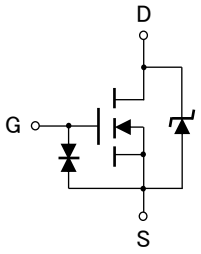
TERMINAL CONNECTOR
①: GATE
②: DRAIN
③: SOURCE

JEITA : SC-62
JEDEC : SOT-89

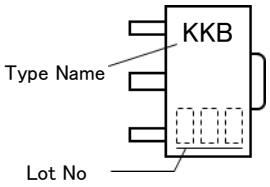
MAXIMUM RATINGS (Ta=25℃)

Symbol	Parameter	Rating	Unit
V_{GSS}	Gate-Source Voltage	±20	V
I_D	Drain Current(DC) ※1	2	A
I_{DP}	Drain Current(Pulse) ※2	8	A
P_D	Total Power Dissipation ※1	1.5	W
I_{AV}	Avalanche Current ※3,4	1.0	A
E_{AV}	Avalanche Energy ※3,4	1.0	mJ
T_{ch}	Channel Temperature	+150	℃
T_{stg}	Storage Temperature	-55～+150	℃

EQUIVALENT CIRCUIT



MARKING



※1 : Package mounted on glass-epoxy substrate (20mm×20mm×1mm, Cu pad 257mm²)
※2 : PW≦1ms, Duty≦1%
※3 : Consecutive pulses PW≦10μs, Duty≦1%
※4 : L=1mH

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Built-in Zener Diode
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【MOSFET】ELECTRICAL CHARACTERISTICS (Ta=25℃)

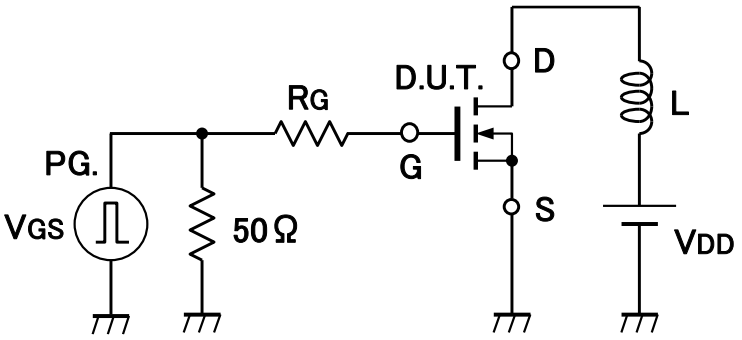
Symbol	Parameter	Test Condition	Limit			Unit
			MIN.	TYP.	MAX.	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D=100μA, V_{GS}=0V	60	–	85	V
I_{GSS}	Gate-Source Leak current	V_{GS}=±20V, V_{DS}=0V	–	–	±10	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V	–	–	1	μA
V_{th}	Gate Threshold Voltage	I_D=250μA, V_{DS}=V_{GS}	1.0	–	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-State Resistance	I_D=2.0A, V_{GS}=4.5V	–	340	–	mΩ
		I_D=2.0A, V_{GS}=10V	–	260	–	
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V, f=1MHz	–	290	–	pF
C_{oss}	Output Capacitance		–	40	–	
C_{rss}	Return Capacitance		–	20	–	
t_{on}	Switching Time	V_{DD}=20V, I_D=200mA V_{GS}=0～5V	–	110	–	ns
t_{off}			–	180	–	

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

Zener Voltage Vz(V)			Reverse current I_R(μA)	
MIN	MAX	I_Z(mA)	MAX	V_R(V)
60	85	0.1	1.0	60

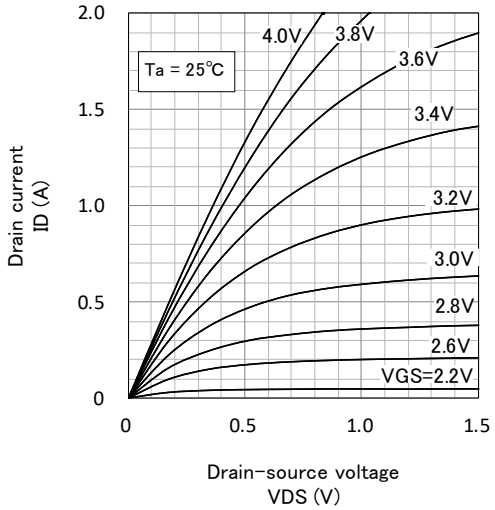
Avalanche current test condition

Ta=25℃
RG=25Ω
VDD=20V
VGS=10→0V
L=1mH

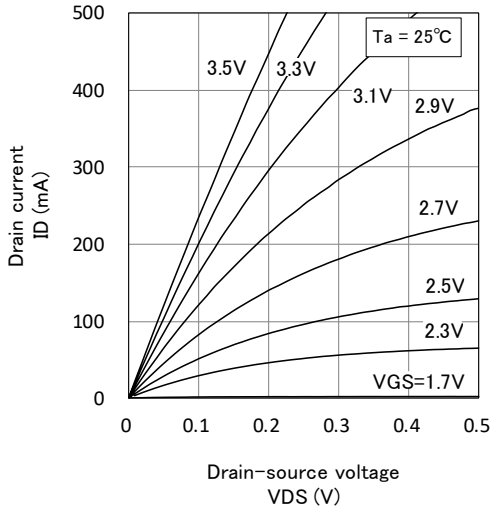


TYPICAL CHARACTERISTICS

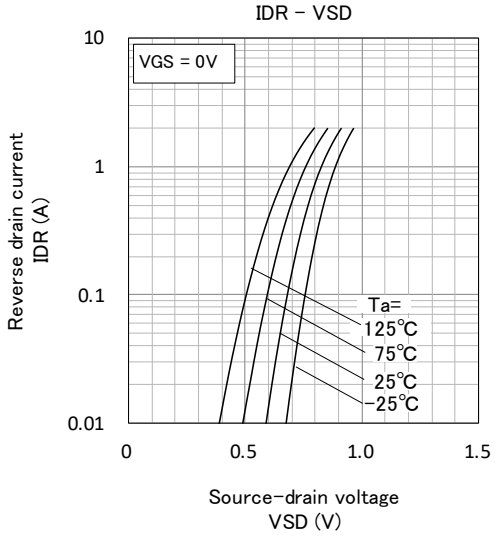
ID – VDS



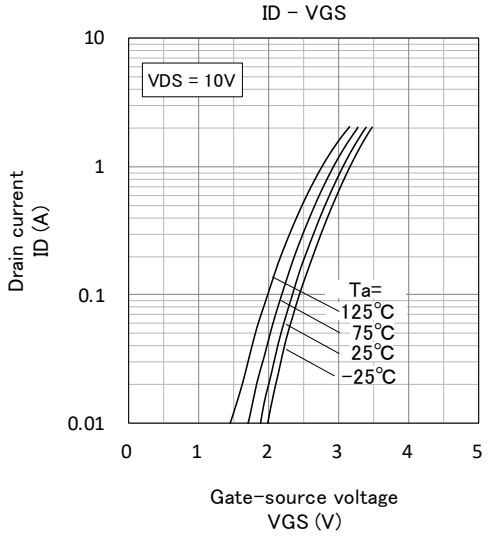
ID – VDS(Low Voltage Area)



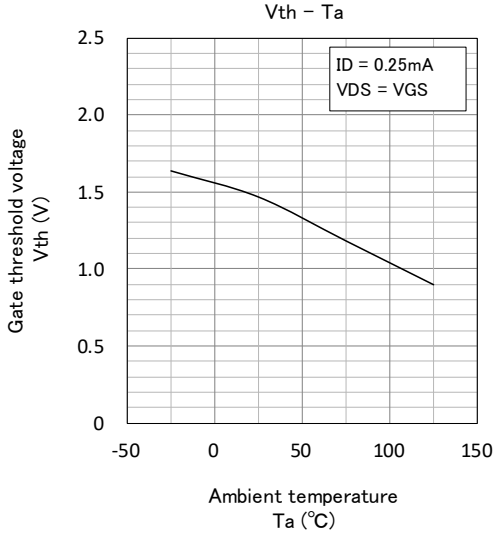
IDR – VSD



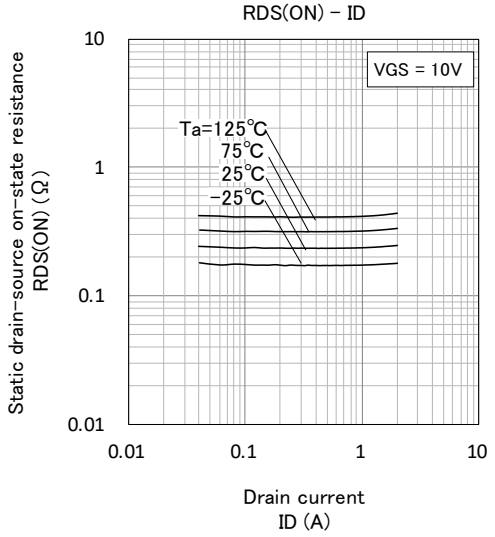
ID – VGS



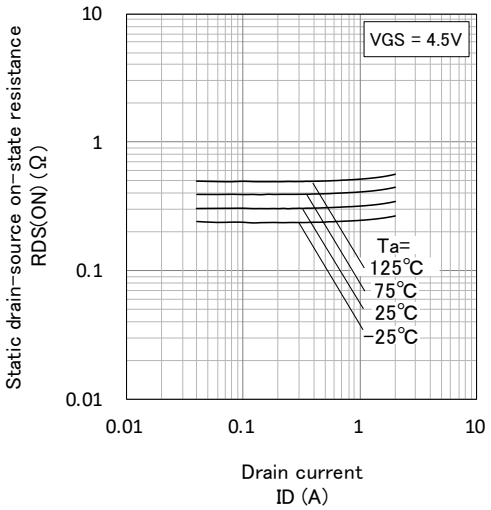
Vth – Ta



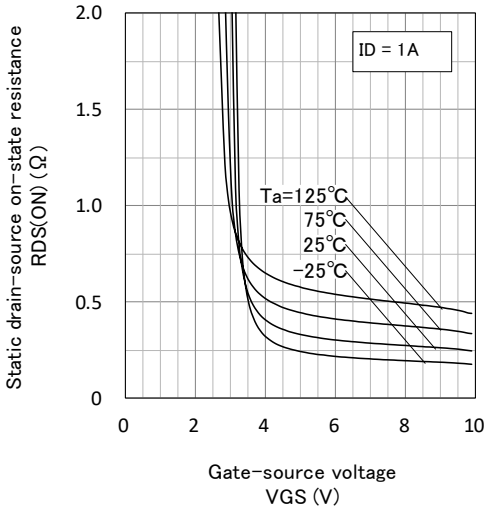
RDS(ON) – ID



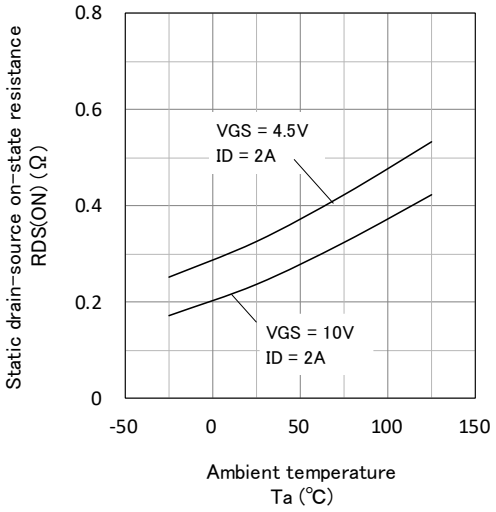
RDS(ON) – ID



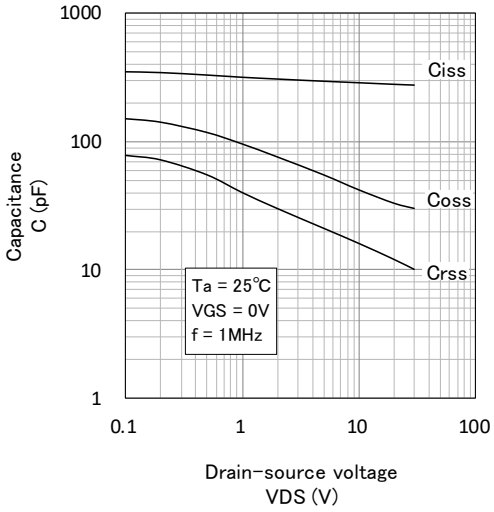
RDS(ON) – VGS



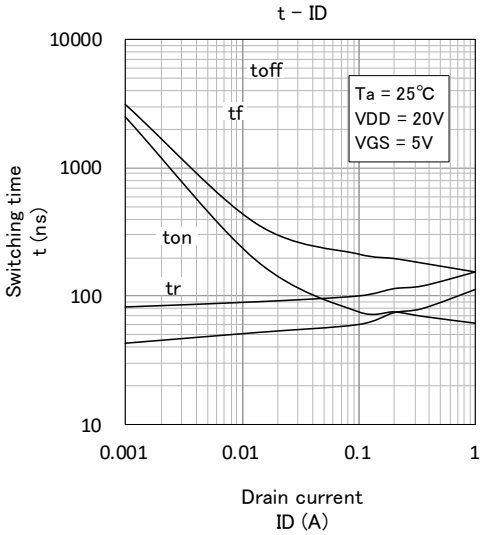
RDS(ON) – Ta



C – VDS

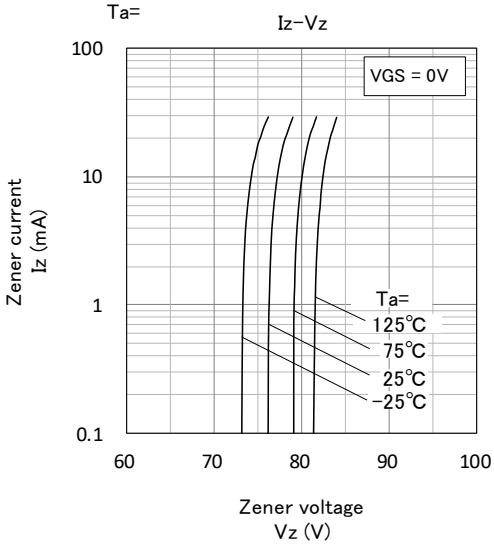


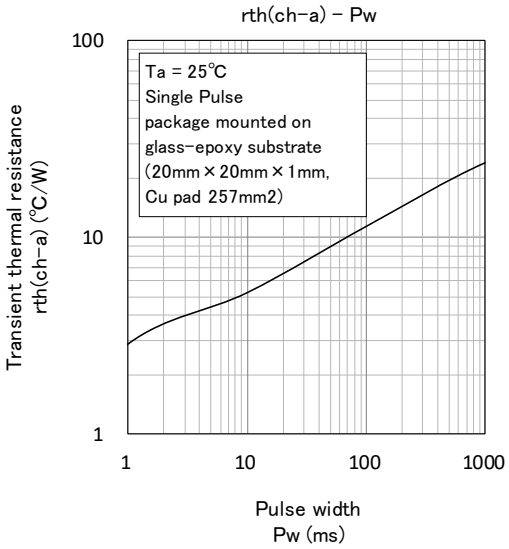
t – ID

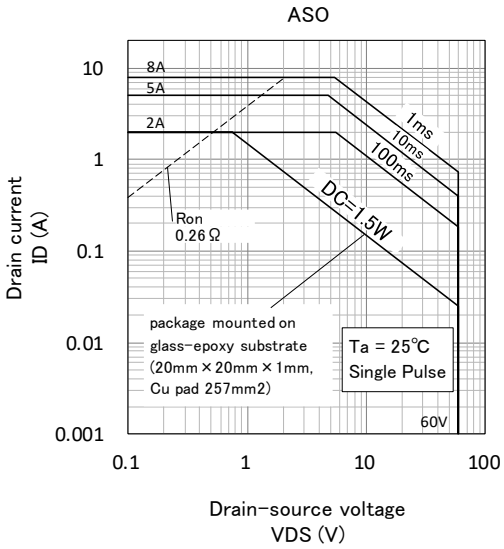


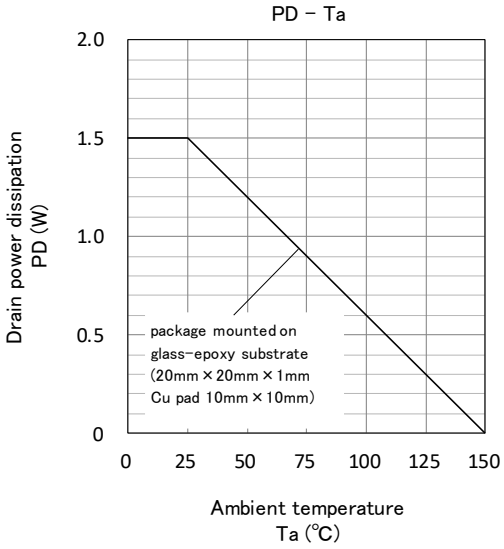
Ta=

Iz–Vz

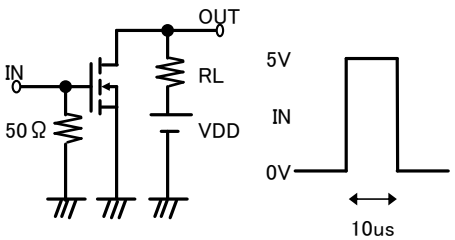




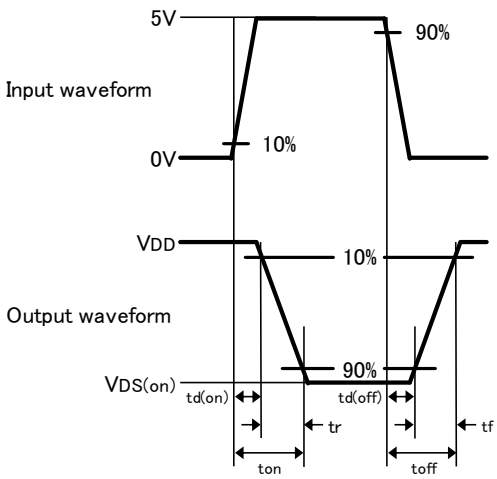




Switching time test condition



Duty ≦ 1%
Input : tr, tf < 10ns
VDD = 20V
Common Source
Ta = 25°C



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