INKA114AP1

Active Clamp
Silicon N-channel MOSFET

DESCRIPTION

INKA114AP1 is a Silicon N-channel Active Clamp MOSFET.
The built in clamp diode connected between drain and gate protects the MOSFET from the counter electromotive force in switching drive of the inductance load.
The circuit layout becomes simple because the freewheel diode is not required.

FEATURE

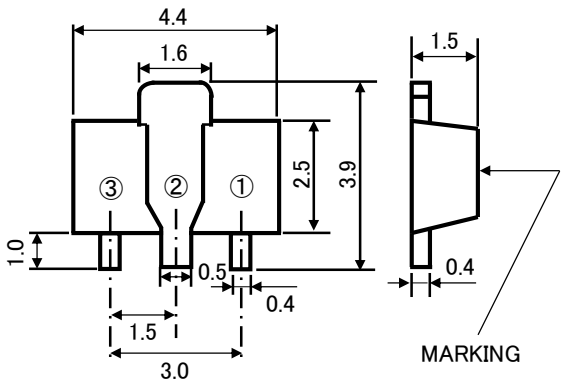
・The built in clamp diode connected between drain and gate.
・Built in bias resistor enables reduction of parts count.
・Drive voltage 4V

APPLICATION

Motor, Solenoid drive etc

OUTLINE DRAWING

Unit : mm



TERMINAL CONNECTOR
①:GATE
②:DRAIN
③:SOURCE

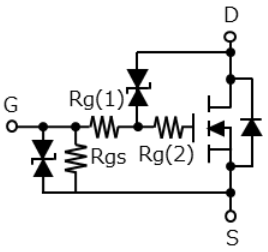
JEITA:SC-62
JEDEC:SOT-89

MAXIMUM RATINGS (Ta=25℃)

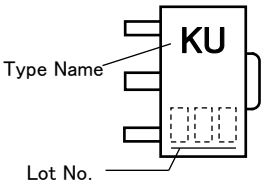
Parameter	Symbol	Rating	Unit
Gate-Source Voltage	V_{GSS}	10	V
Drain Current(DC) ※1	I_D	0.7	A
Drain current(Pulse) ※2	I_{DP}	1.5	A
Total Power Dissipation ※1	P_D	0.65	W
Channel Temperature	T_{ch}	+150	℃
Storage temperature	T_{stg}	−55～+150	℃

※1 package mounted on 45mm×19mm×1mm glass-epoxy substrate
※2 Pw≦1ms , Duty cycle≦1%

EQUIVALENT CIRCUIT



MARKING

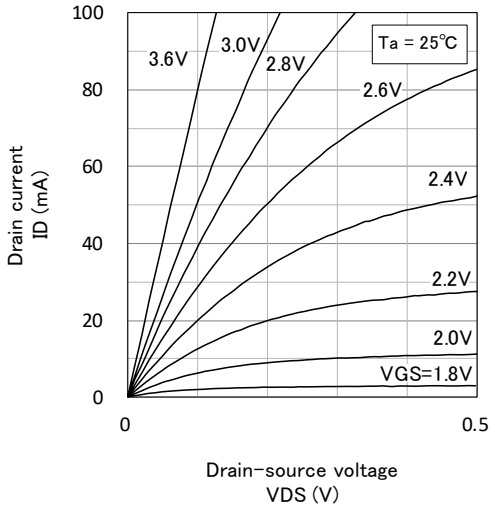


ELECTRICAL CHARACTERISTICS (Ta=25℃)

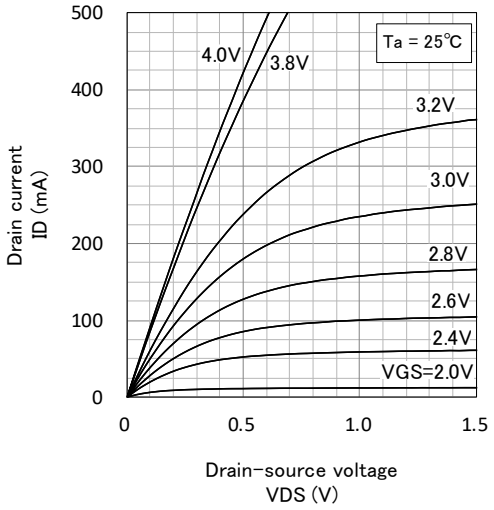
Parameter	Symbol	Test Condition	Limit			Unit
			MIN	TYP	MAX	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0V	38	−	62	V
Gate-Source Leak current	I_{GSS}	V_{GS}=±5V, V_{DS}=0V	−	−	±90	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V ,V_{GS}=0V	−	−	1.0	μA
Gate Threshold Voltage	V_{th}	I_D=1mA, V_{DS}= V_{GS}	1.0	−	2.5	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	I_D=150mA, V_{GS}=5V	−	1.1	1.8	Ω
Gate-Source Resistance	R_{gs}		−	100	−	kΩ
Gate Resistance1	R_{g1}		−	10	−	kΩ
Gate Resistance2	R_{g2}		−	500	−	Ω
Input Capacitance	C_{iss}		−	8	−	pF
Output Capacitance	C_{oss}	V_{DS}=10V, V_{GS}=0V, f=1MHz	−	16	−	pF
Feedback Capacitance	C_{rss}		−	5	−	pF
Switching Time	t_{on}	V_{DD}=30V, I_D=100mA	−	2.1	−	μs
	t_{off}	V_{GS}=0～10V	−	0.9	−	μs

TYPICAL CHARACTERISTICS

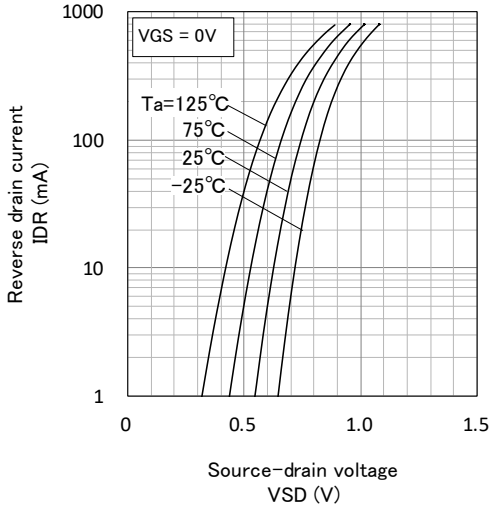
ID – VDS(Low voltage area)



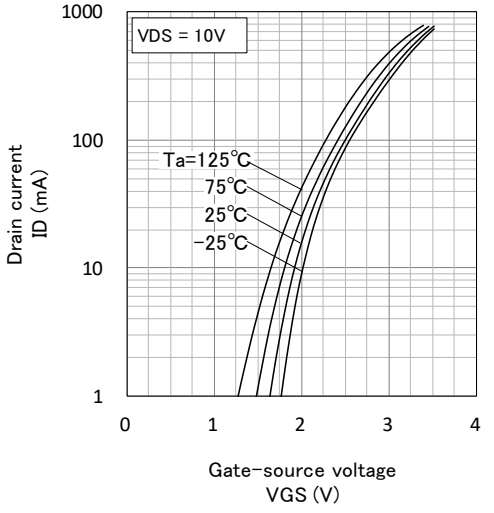
ID – VDS



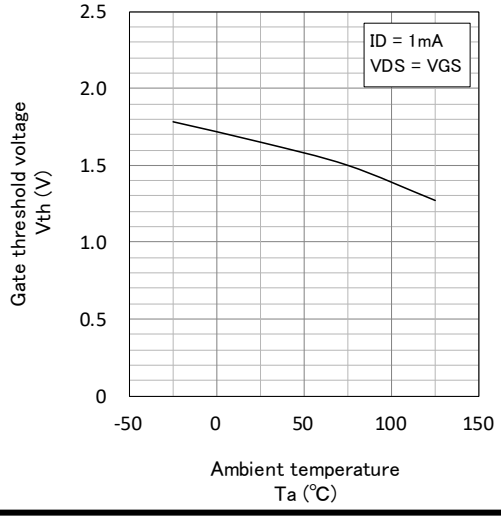
IDR – VSD



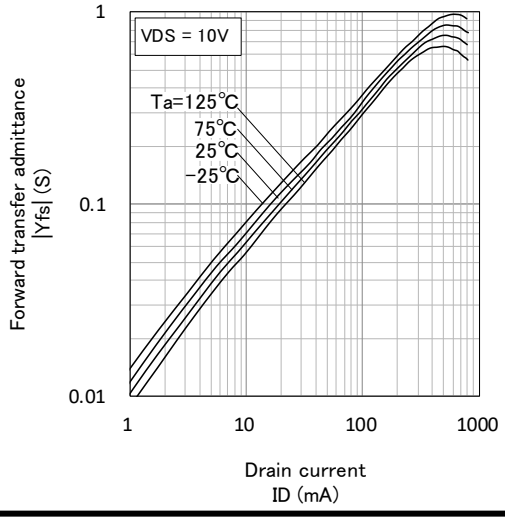
ID – VGS



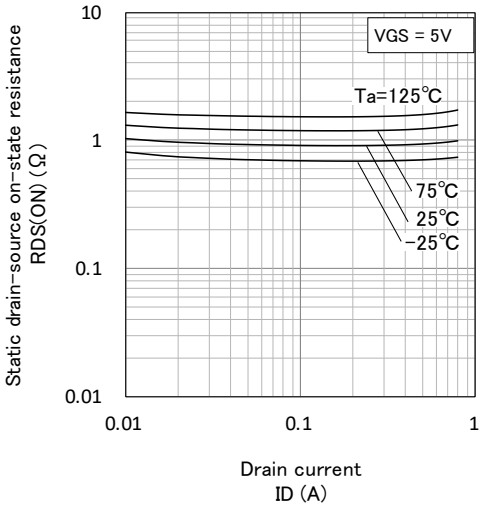
Vth – Ta



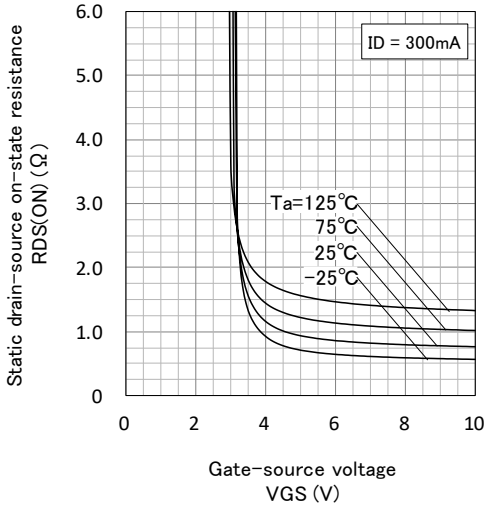
|Yfs| – ID



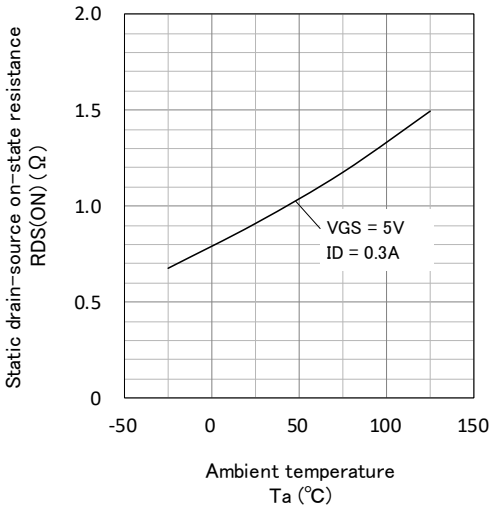
RDS(ON) – ID



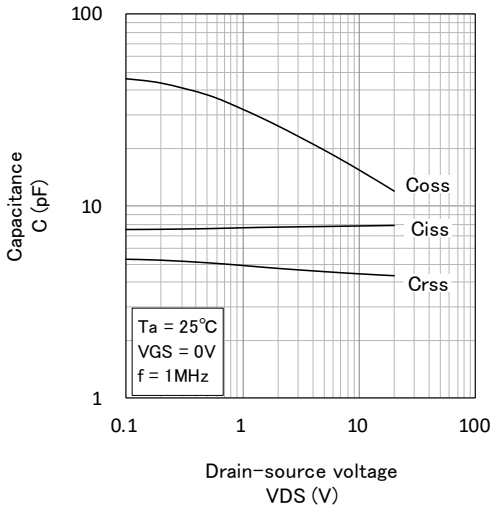
RDS(ON) – VGS



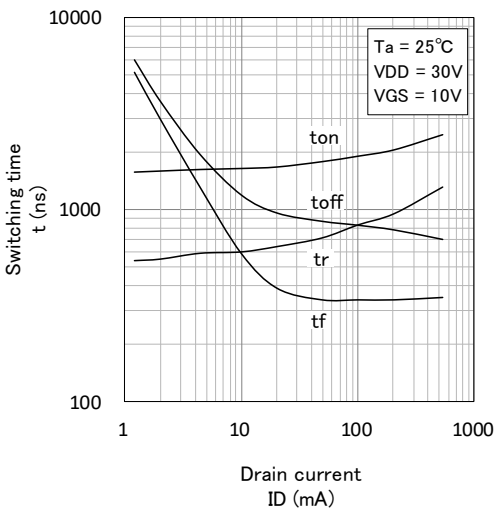
RDS(ON) – Ta



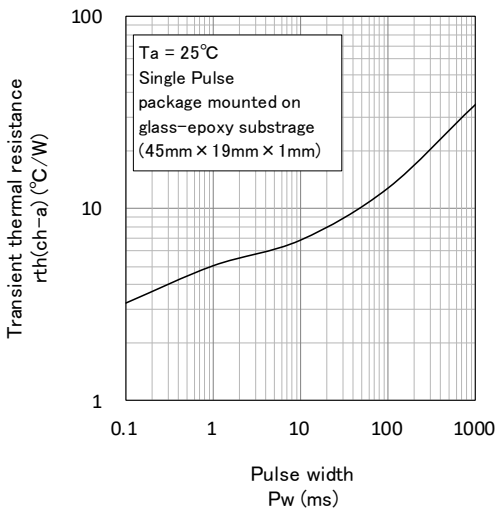
C – VDS

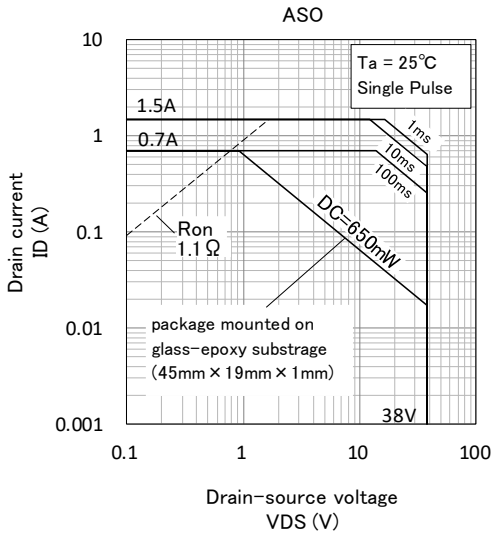


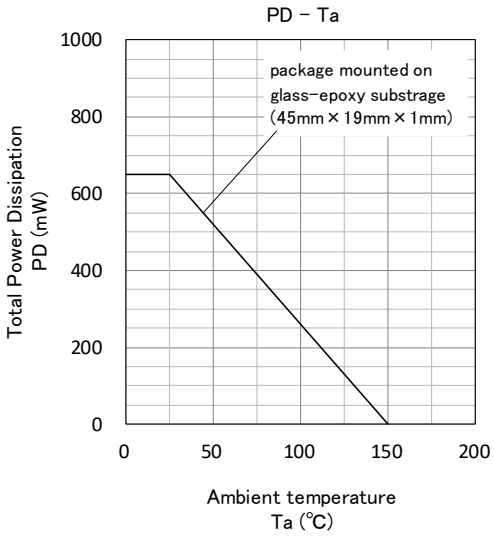
t – ID



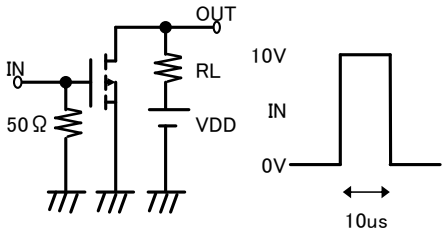
rth(ch-a) – Pw



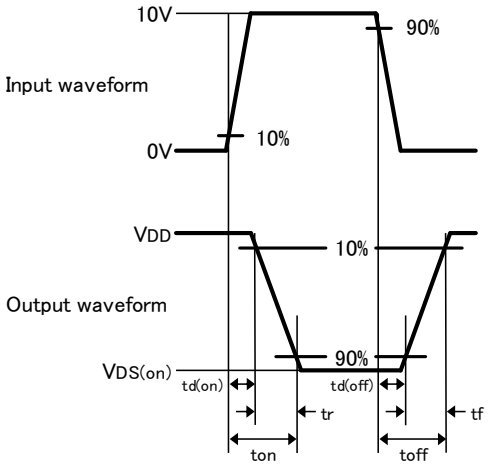




Switching time test condition



Duty ≦ 1%
Input:tr, tf < 10ns
VDD = 30V
Common source
Ta = 25℃



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