

10V Drive Nch MOSFET

R6015ANZ

● Structure

Silicon N-channel MOSFET

● Features

- 1) Low on-resistance.
- 2) Low input capacitance.
- 3) High ESD.

● Application

Switching

● Packaging specifications

Type	Package	Bulk
	Code	-
	Basic ordering unit (pieces)	360
R6015ANZ		○

● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	600	V
Gate-source voltage		V_{GS}	±30	V
Drain current	Continuous	I_D *3	±15	A
	Pulsed	I_{DP} *1	±60	A
Source current (Body Diode)	Continuous	I_S *3	15	A
	Pulsed	I_{SP} *1	60	A
Avalanche current		I_{AS} *2	7.5	A
Avalanche energy		E_{AS} *2	15	mJ
Power dissipation		P_D *4	110	W
Channel temperature		T_{ch}	150	°C
Range of storage temperature		T_{stg}	-55 to +150	°C

 *1 $P_w \leq 10 \mu s$, Duty cycle $\leq 1\%$

 *2 $L = 500 \mu H$, $V_{DD} = 50V$, $R_G = 25 \Omega$, $T_{ch} = 25^\circ C$

*3 Limited only by maximum channel temperature allowed.

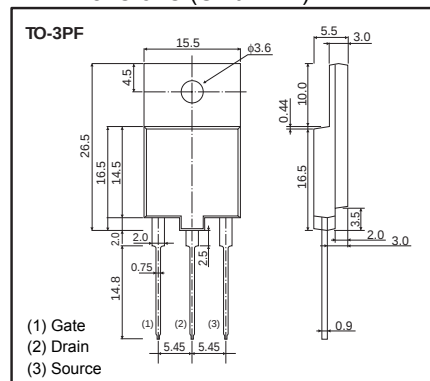
 *4 $T_C = 25^\circ C$

● Thermal resistance

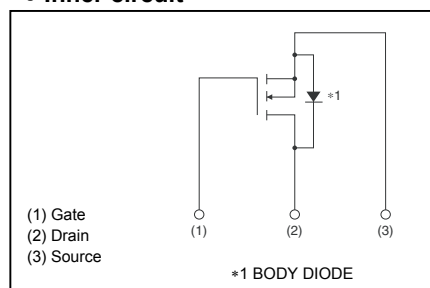
Parameter	Symbol	Limits	Unit
Channel to Case	$R_{th(ch-c)}$ *	1.13	°C / W

 * $T_C = 25^\circ C$

● Dimensions (Unit : mm)



● Inner circuit



●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	600	-	-	V	$I_D=1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	-	-	100	μA	$V_{DS}=600V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	2.95	-	4.15	V	$V_{DS}=10V$, $I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	0.23	0.3	Ω	$I_D=7.5A$, $V_{GS}=10V$
Forward transfer admittance	$ Y_{fs} ^*$	4.5	-	-	S	$V_{DS}=10V$, $I_D=7.5A$
Input capacitance	C_{iss}	-	1700	-	pF	$V_{DS}=25V$
Output capacitance	C_{oss}	-	1120	-	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	-	80	-	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	50	-	ns	$V_{DD}\approx 300V$, $I_D=7.5A$
Rise time	t_r^*	-	50	-	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}^*$	-	150	-	ns	$R_L=40\Omega$
Fall time	t_f^*	-	60	-	ns	$R_G=10\Omega$
Total gate charge	Q_g^*	-	50	-	nC	$V_{DD}\approx 300V$
Gate-source charge	Q_{gs}^*	-	8	-	nC	$I_D=15A$
Gate-drain charge	Q_{gd}^*	-	20	-	nC	$V_{GS}=10V$

*Pulsed

●Body diode characteristics (Source-Drain)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward voltage	V_{SD}^*	-	-	1.5	V	$I_S=15A$, $V_{GS}=0V$

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●Electrical characteristic curves

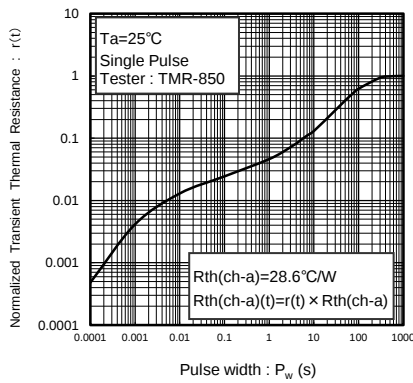
 Fig.1 Normalized Transient Thermal Resistance
v.s. Pulse Width


Fig.2: Typical output characteristics(I)

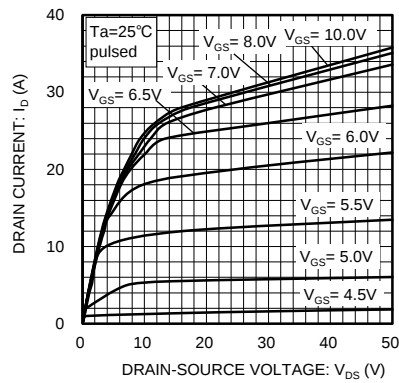


Fig.3: Typical output characteristics(II)

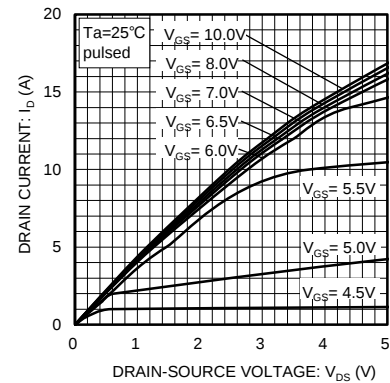


Fig.4 Typical Transfer Characteristics

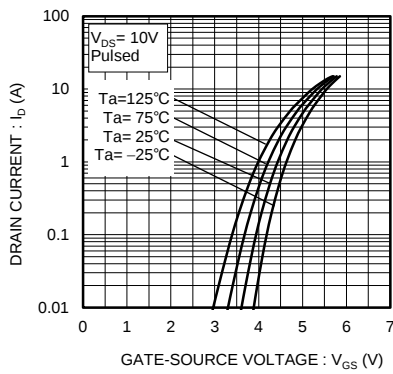
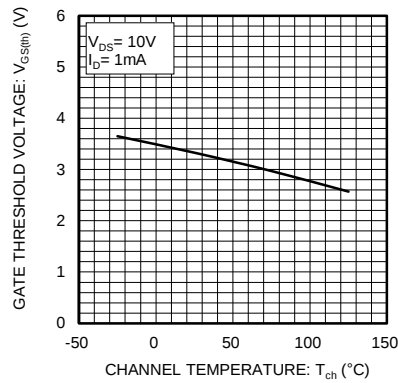
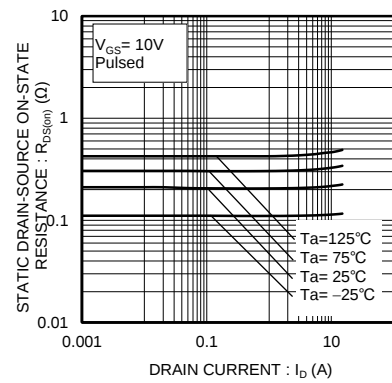
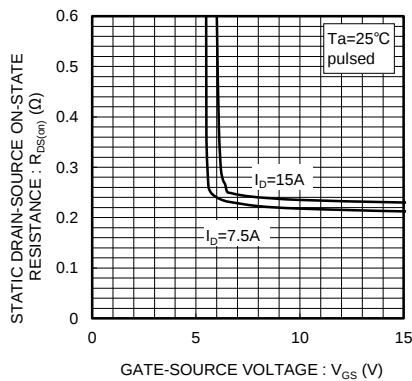
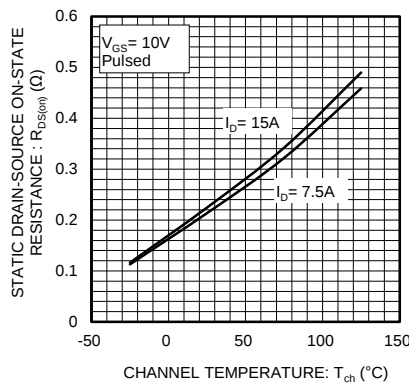
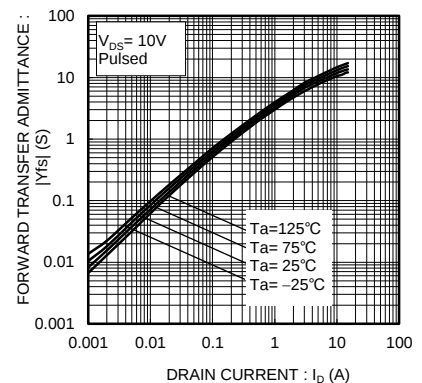

 Fig.5 Gate Threshold Voltage
vs. Channel Temperature

 Fig.6 Static Drain-Source On-State
Resistance vs. Drain Current

 Fig.7 Static Drain-Source On-State
Resistance vs. Gate Source Voltage

 Fig.8 Static Drain-Source On-State
Resistance vs. Channel Temperature

 Fig.9 Forward Transfer Admittance
vs. Drain Current


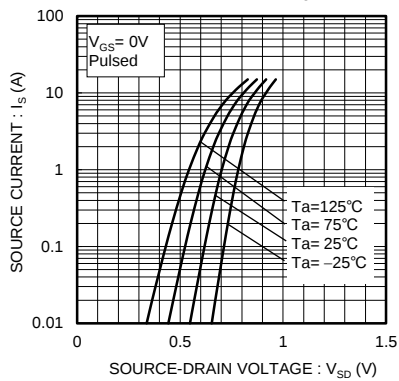
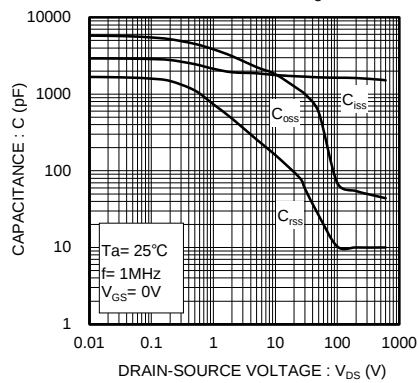
Fig.10 Source Current vs.
Source-Drain VoltageFig.11 Typical Capacitance vs.
Drain-Source Voltage

Fig.12 Dynamic Input Characteristics

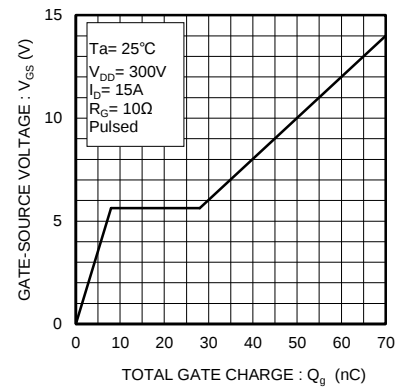
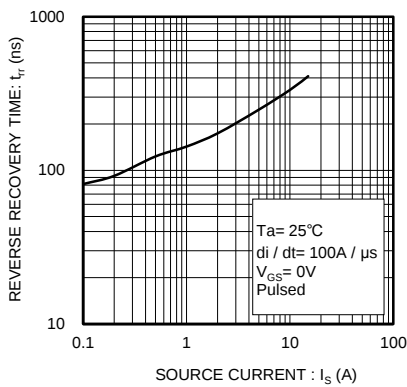
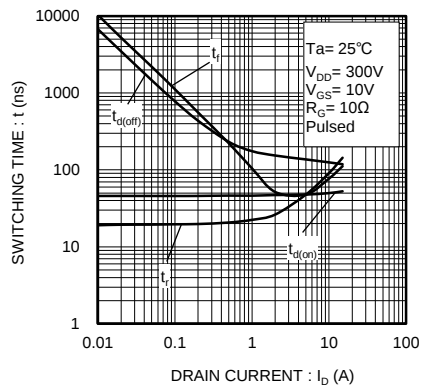
Fig.13 Reverse Recovery Time
vs. Source Current

Fig.14 Switching Characteristics



● Measurement circuits

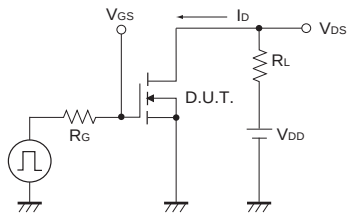


Fig.1-1 Switching Time Measurement Circuit

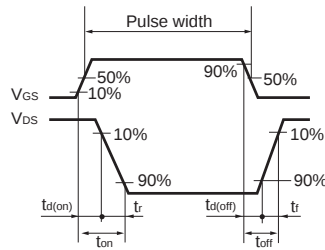


Fig.1-2 Switching Waveforms

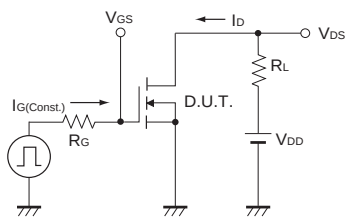


Fig.2-1 Gate Charge Measurement Circuit

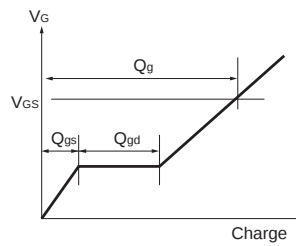


Fig.2-2 Gate Charge Waveform

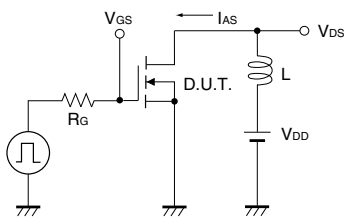


Fig.3-1 Avalanche Measurement Circuit

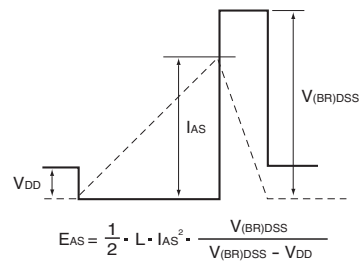


Fig.3-2 Avalanche Waveform

Notes

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