

# 10V Drive Nch MOSFET

## R6015ANJ

### ●Structure

Silicon N-channel MOSFET

### ●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Gate-source voltage ( $V_{GS}$ ) guaranteed to be  $\pm 30V$ .
- 4) Drive circuits can be simple.
- 5) Parallel use is easy.

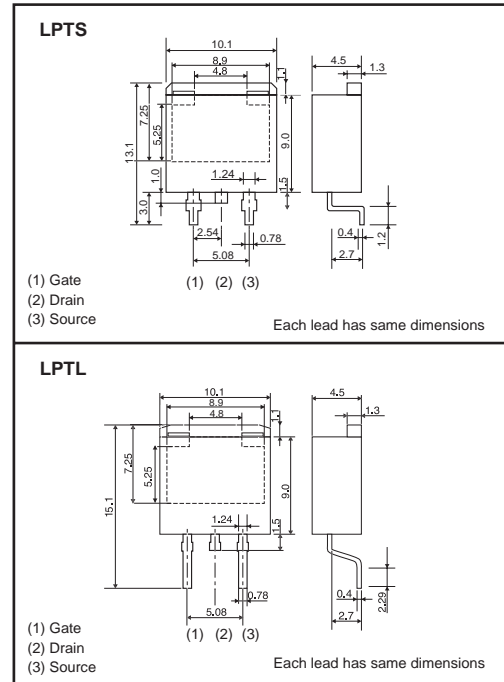
### ●Applications

Switching

### ●Packaging specifications

Type	Package	Taping	
	Code	LPTS	TL
		LPTL	TLL
	Basic ordering unit (pieces)	1000	

### ●Dimensions (Unit : mm)

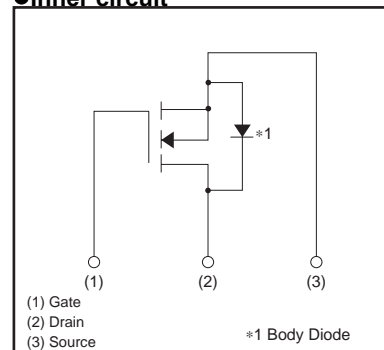


### ●Absolute maximum ratings ( $T_a=25^\circ C$ )

Parameter	Symbol	Limits	Unit	
Drain-source voltage	$V_{bss}$	600	V	
Gate-source voltage	$V_{GSS}$	$\pm 30$	V	
Drain current	Continuous	$I_D$ *3	$\pm 15$	A
	Pulsed	$I_{DP}$ *1	$\pm 60$	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	15.0	mJ	
Total power dissipation ( $T_c=25^\circ C$ )	$P_D$	100	W	
Channel temperature	$T_{ch}$	150	$^\circ C$	
Range of storage temperature	$T_{stg}$	-55 to +150	$^\circ C$	

\*1  $P_w \leq 10\mu s$ , Duty cycle  $\leq 1\%$   
 \*2  $L = 500\mu H$ ,  $V_{bb} = 50V$ ,  $R_G = 25\Omega$ , Starting,  $T_{ch} = 25^\circ C$   
 \*3 Limited only by maximum temperature allowed

### ●Inner circuit



### ●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	$R_{th(ch-c)}$	1.25	$^\circ C/W$

**●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	$V_{GS(th)}$	2.5	–	4.5	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	$I_D=7.5A, V_{DS}=10V$
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	$I_D=7.5A, V_{DD}\approx 300V$
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	$I_D=15A$ $V_{GS}=10V$
Gate-drain charge	$Q_{gd}^*$	–	20	–	nC	$R_L=20\Omega / R_G=10\Omega$

\* Pulsed

**●Body diode characteristics (Source-drain) (Ta=25°C)**

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

\* Pulsed

●Electrical characteristics curves

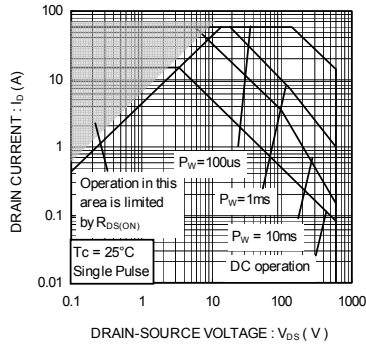


Fig.1 Maximum Safe Operating Area

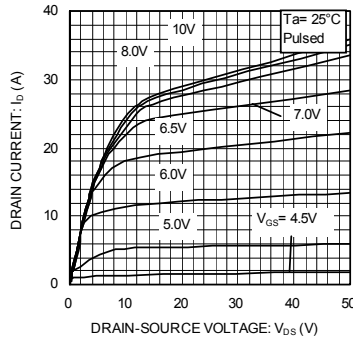


Fig.2: Typical output characteristics ( I )

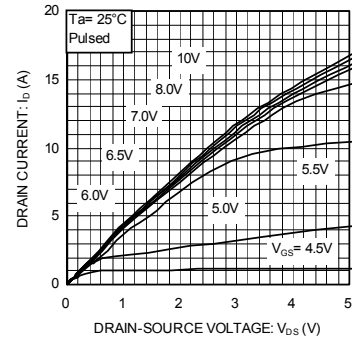


Fig.3: Typical output characteristics( II )

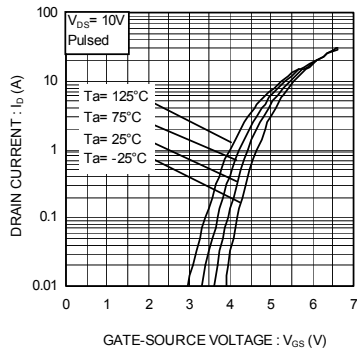


Fig.4 Typical Transfer Characteristics

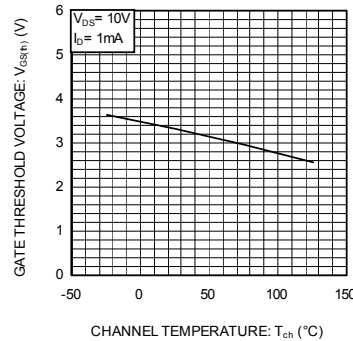


Fig.5 Gate Threshold Voltage vs. Channel Temperature

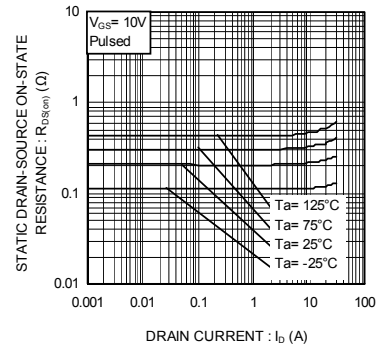


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

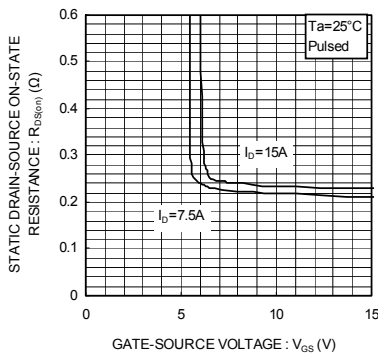


Fig.7 Static Drain-Source On-State Resistance vs. Gate Source Voltage

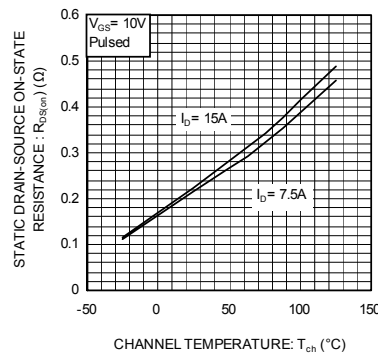


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

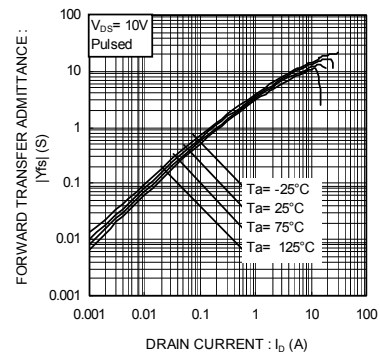


Fig.9 Forward Transfer Admittance vs. Drain Current

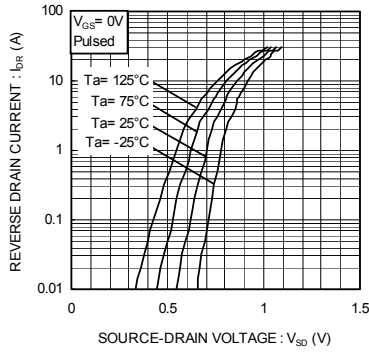


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

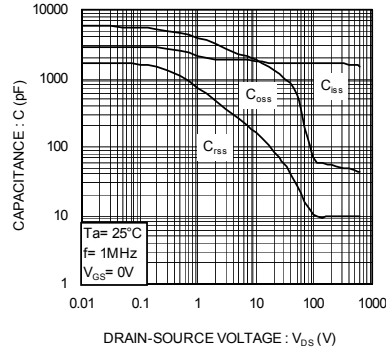


Fig.11 Typical Capacitance vs. Drain-Source Voltage

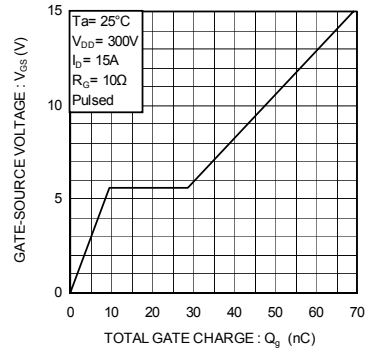


Fig.12 Dynamic Input Characteristics

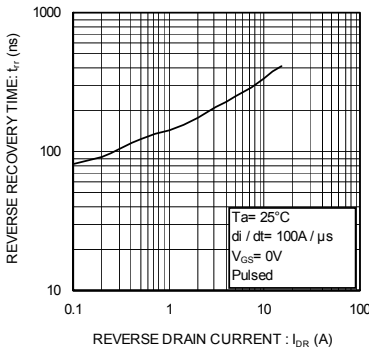


Fig.13 Reverse Recovery Time vs. Reverse Drain Current

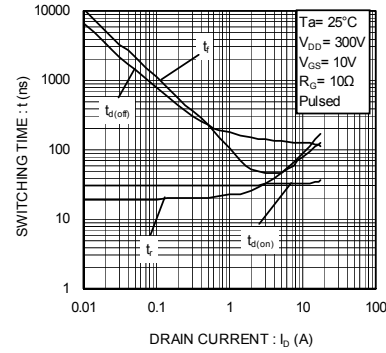


Fig.14 Switching Characteristics

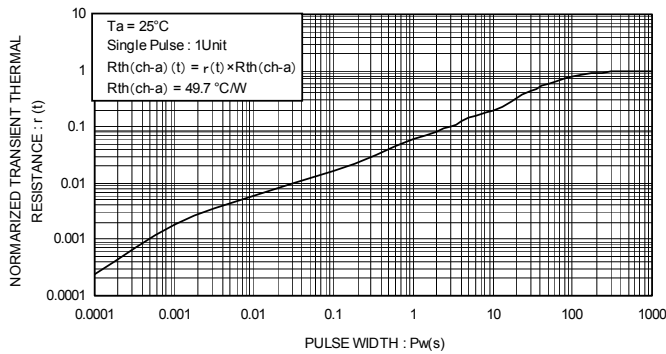


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

●Measurement circuits

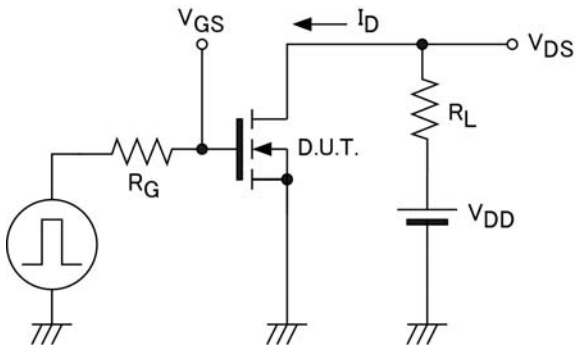


Fig.1 Switching time measurement circuit

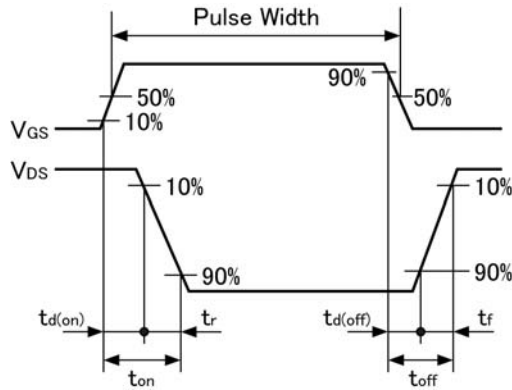


Fig.2 Switching waveforms

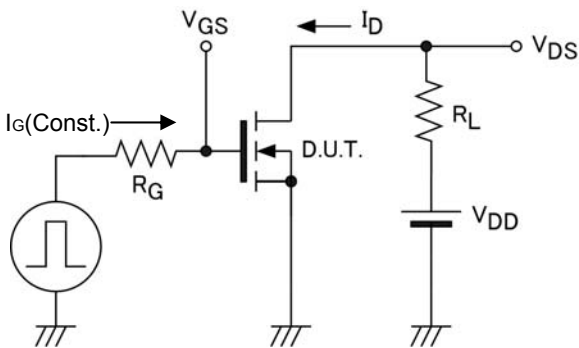


Fig.3 Gate charge measurement circuit

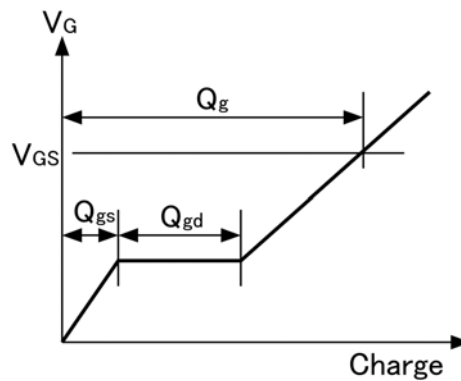


Fig.4 Gate charge waveform

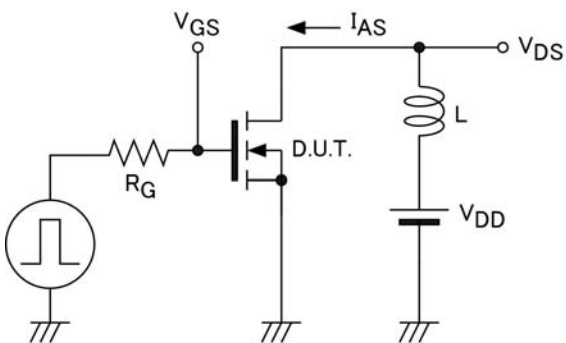


Fig.5 Avalanche measurement circuit

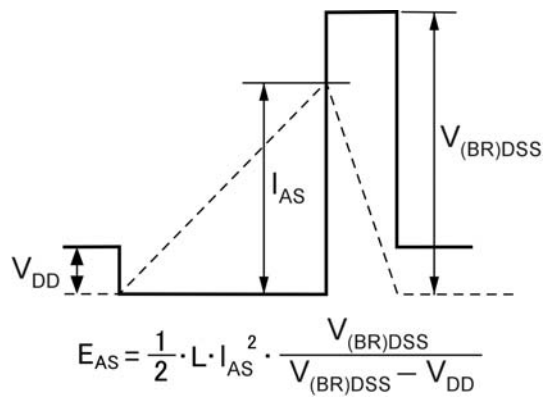


Fig.6 Avalanche waveform

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