

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.

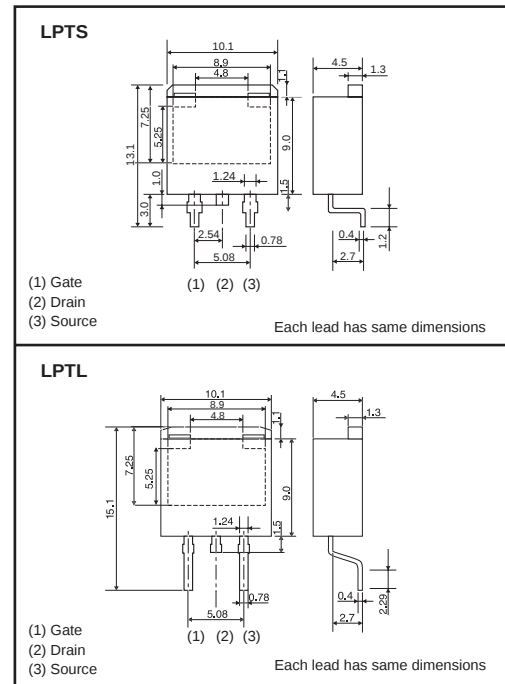
●Applications

Switching

●Packaging specifications

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

●Dimensions (Unit : mm)



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

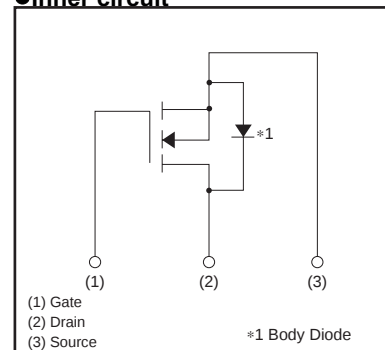
Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	600	V
Gate-source voltage		V_{GS}	± 30	V
Drain current	Continuous	I_D *3	± 15	A
	Pulsed	I_{DP} *1	± 60	A
Source current (Body Diode)	Continuous	I_S *3	15	A
	Pulsed	I_{SP} *1	60	A
Avalanche Current		I_{AS} *2	7.5	A
Avalanche Energy		E_{AS} *2	15.0	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 $P_w \leq 10W$, Duty cycle $\leq 1\%$

 *2 $L \leq 500\mu H$, $V_{DS}=50V$, $R_G=25\Omega$, 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

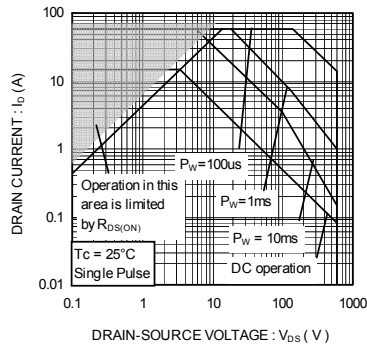


Fig.1 Maximum Safe Operating Area

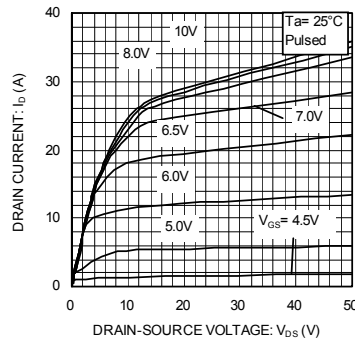


Fig.2: Typical output characteristics(I)

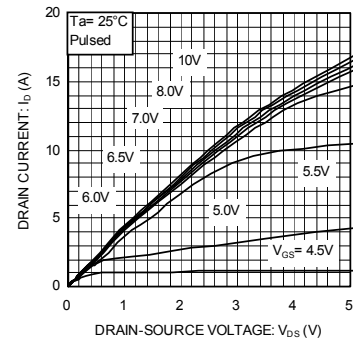


Fig.3: Typical output characteristics(II)

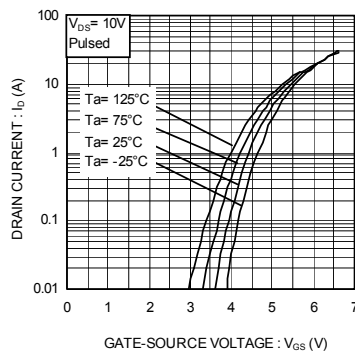


Fig.4 Typical Transfer Characteristics

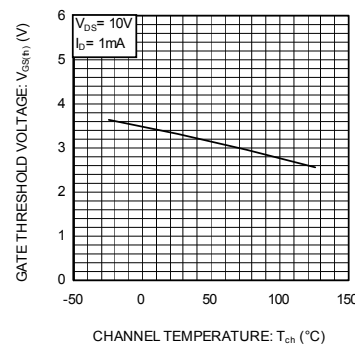


Fig.5 Gate Threshold Voltage vs. Channel Temperature

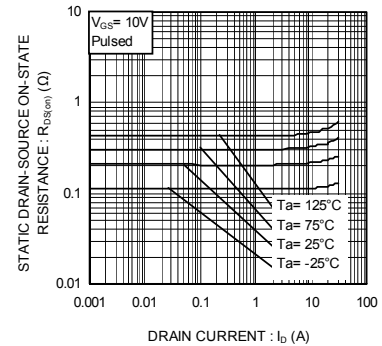


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

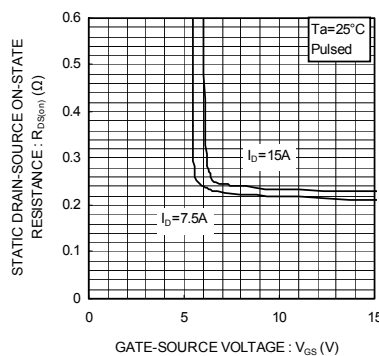


Fig.7 Static Drain-Source On-State Resistance vs. Gate Source Voltage

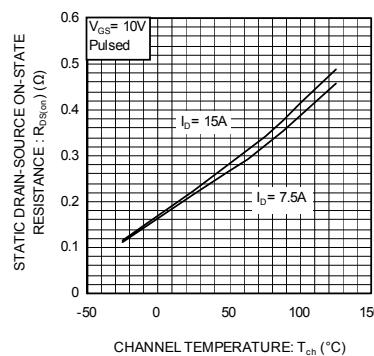


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

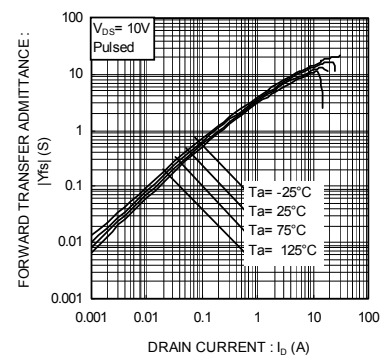


Fig.9 Forward Transfer Admittance vs. Drain Current

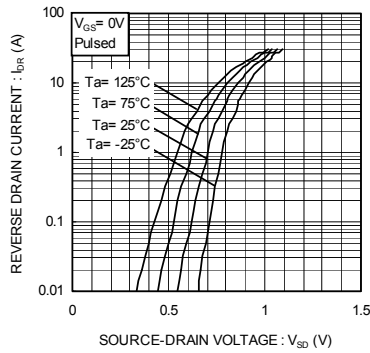


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

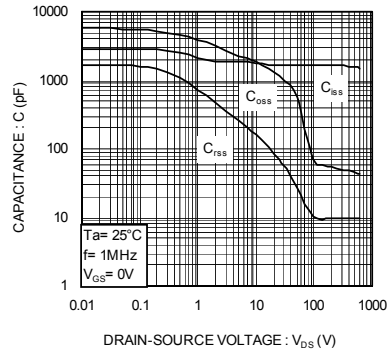


Fig.11 Typical Capacitance vs. Drain-Source Voltage

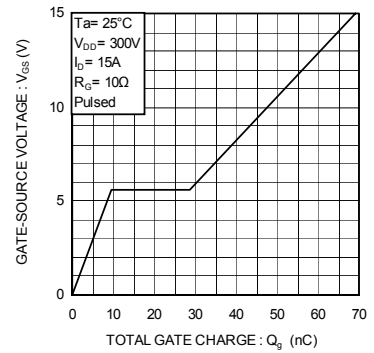


Fig.12 Dynamic Input Characteristics

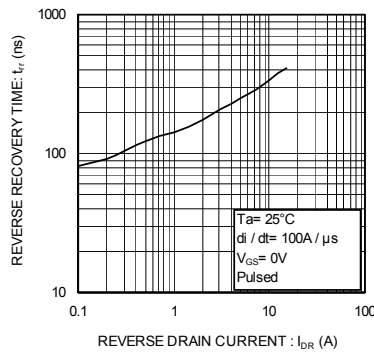


Fig.13 Reverse Recovery Time vs. Reverse Drain Current

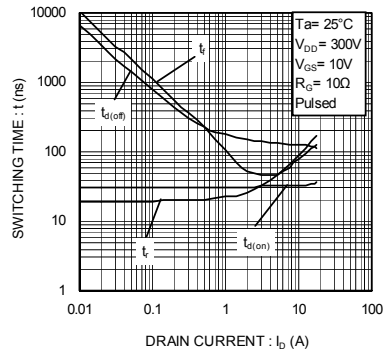


Fig.14 Switching Characteristics

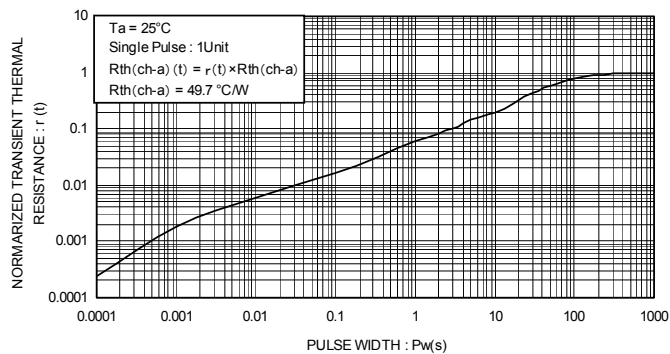


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

●Measurement circuits

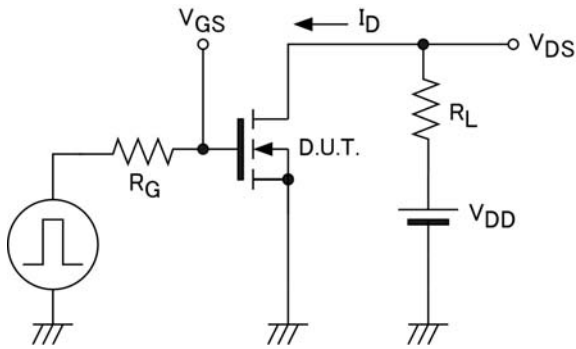


Fig.1 Switching time measurement circuit

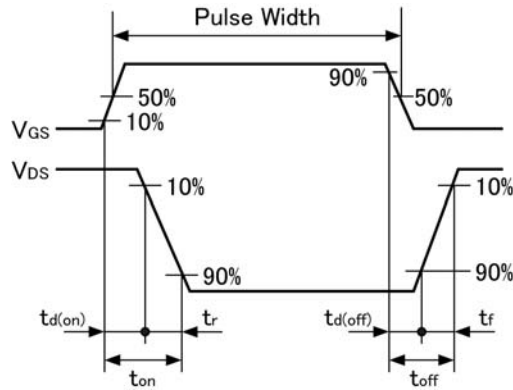


Fig.2 Switching waveforms

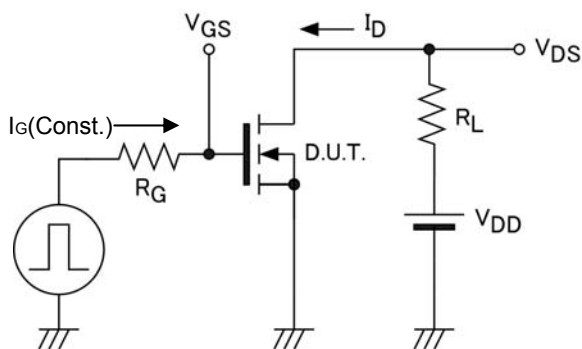


Fig.3 Gate charge measurement circuit

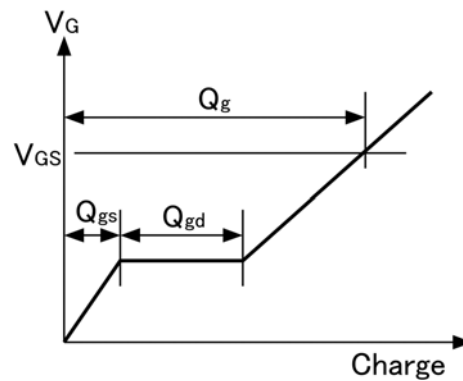


Fig.4 Gate charge waveform

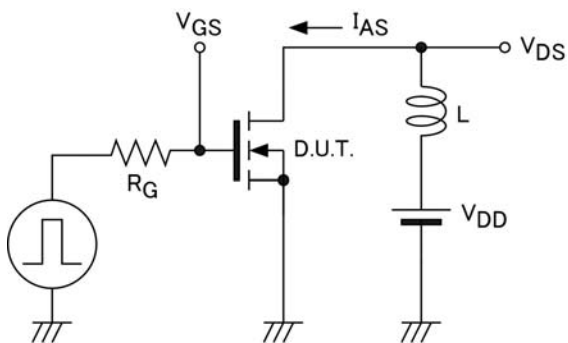


Fig.5 Avalanche measurement circuit

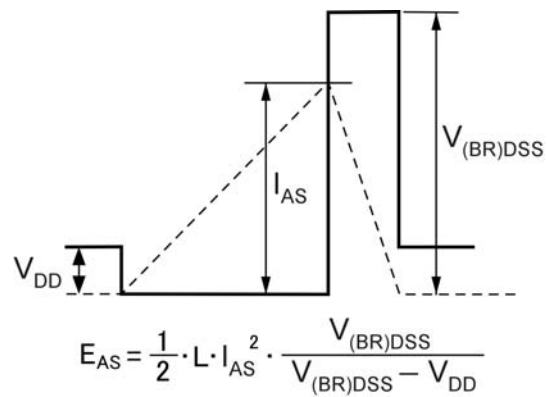


Fig.6 Avalanche waveform

Notes

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