

10V Drive Nch MOSFET

R5016ANX

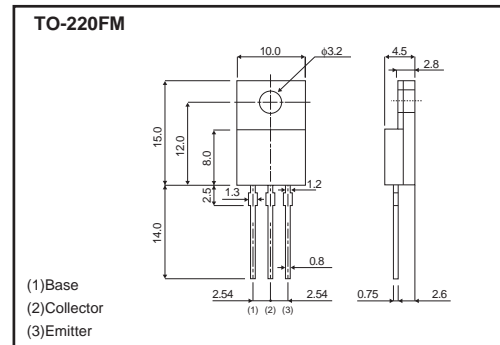
●Structure

Silicon N-channel MOSFET

●Features

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

●Dimensions (Unit : mm)



●Applications

Switching

●Packaging specifications

	Package	Bulk
	Code	-
Type	Basic ordering unit (pieces)	500
R5016ANX		○

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

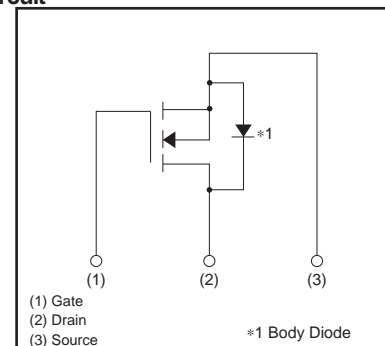
Parameter	Symbol	Limits	Unit	
Drain-source voltage	V_{DS}	500	V	
Gate-source voltage	V_{GS}	± 30	V	
Drain current	Continuous	I_D *3	± 16	A
	Pulsed	I_{DP} *1	± 64	A
Source current (Body Diode)	Continuous	I_S *3	16	A
	Pulsed	I_{SP} *1	64	A
Avalanche Current	I_{AS} *2	8	A	
Avalanche Energy	E_{AS} *2	18	mJ	
Total power dissipation ($T_c=25^\circ C$)	P_D	50	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 $L = 500 \mu H$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting, $T_{ch} = 25^\circ C$

*3 Limited only by maximum temperature allowed

●Inner circuit



●Thermal resistance

Parameter	Symbol	Limits	Unit
Channel to case	$R_{th(ch-c)}$	2.5	$^\circ C/W$

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●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	I _{GSS}	–	–	±100	nA	V _{GS} =±30V, V _{DS} =0V
Drain-source breakdown voltage	V _{(BR)DSS}	500	–	–	V	I _D =1mA, V _{GS} =0V
Zero gate voltage drain current	I _{DSS}	–	–	100	μA	V _{DS} =500V, 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)} *	–	0.21	0.27	Ω	I _D =8A, V _{GS} =10V
Forward transfer admittance	Y _{fs} *	6.0	–	–	S	I _D =8A, V _{DS} =10V
Input capacitance	C _{iss}	–	1800	–	pF	V _{DS} =25V
Output capacitance	C _{oss}	–	750	–	pF	V _{GS} =0V
Reverse transfer capacitance	C _{rss}	–	55	–	pF	f=1MHz
Turn-on delay time	t _{d(on)} *	–	40	–	ns	I _D =8A, V _{DD} ≒250V
Rise time	t _r *	–	50	–	ns	V _{GS} =10V
Turn-off delay time	t _{d(off)} *	–	150	–	ns	R _L =31.3Ω
Fall time	t _f *	–	55	–	ns	R _G =10Ω
Total gate charge	Q _g *	–	50	–	nC	V _{DD} ≒250V
Gate-source charge	Q _{gs} *	–	9.5	–	nC	I _D =16A
Gate-drain charge	Q _{gd} *	–	21	–	nC	V _{GS} =10V R _L =15.6Ω / R _G =10Ω

* 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 = 16A, V _{GS} =0V

* Pulsed

Transistors

●Electrical characteristics curves

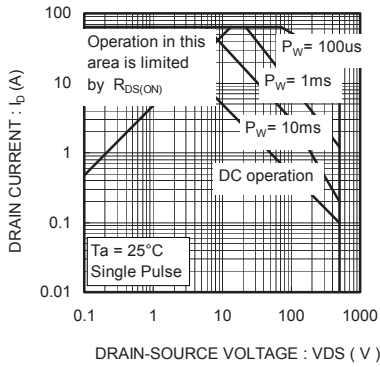


Fig.1 Maximum Safe Operating Area

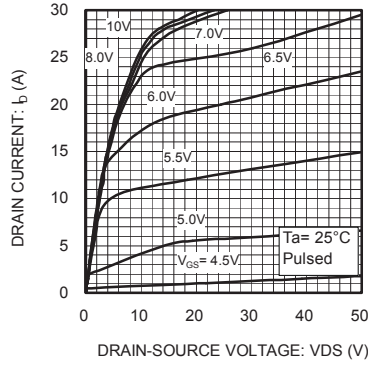


Fig.2 Typical Output Characteristics (I)

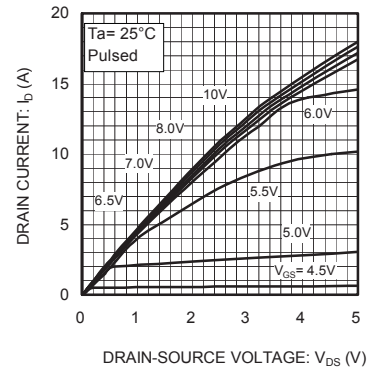


Fig.3 Typical Output Characteristics (II)

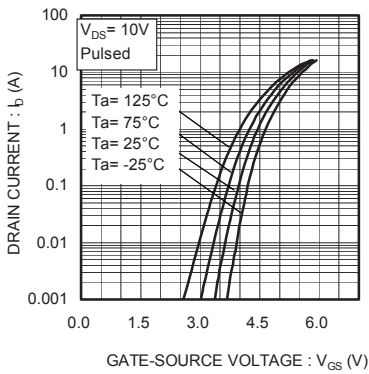


Fig.4 Typical Transfer Characteristics

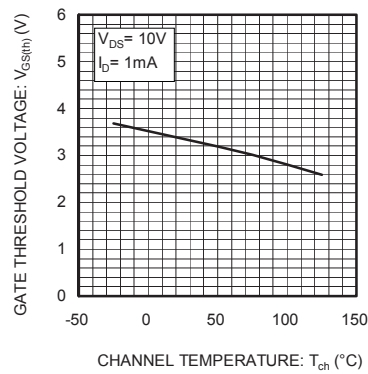


Fig.5 Gate Threshold Voltage vs. Channel Temperature

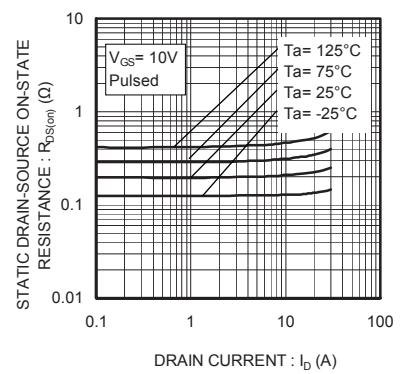


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current

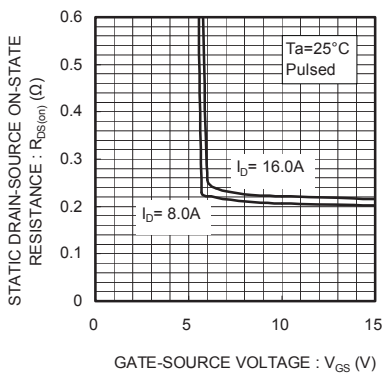


Fig.7 Static Drain-Source On-State Resistance vs. Gate Source

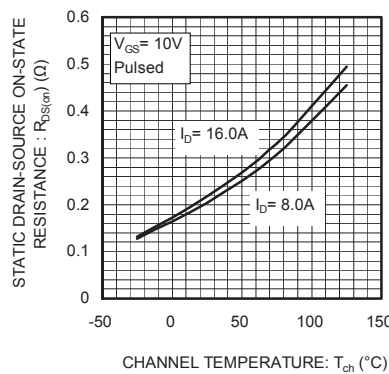


Fig.8 Static Drain-Source On-State Resistance vs. Channel

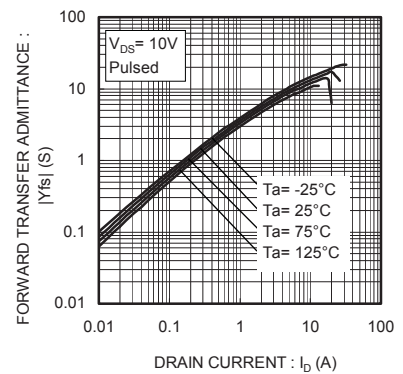


Fig.9 Forward Transfer Admittance vs. Drain Current

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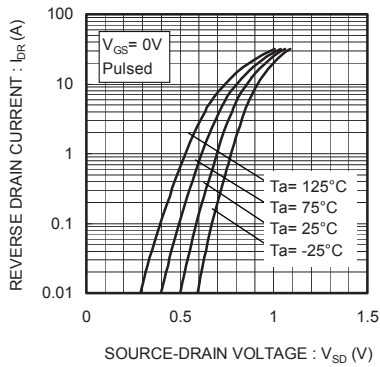


Fig.10 Reverse Drain Current vs. Source-Drain Voltage

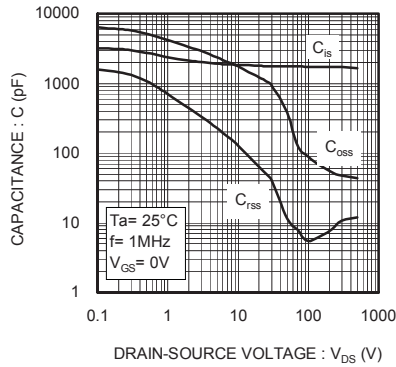


Fig.11 Typical Capacitance vs. Drain-Source Voltage

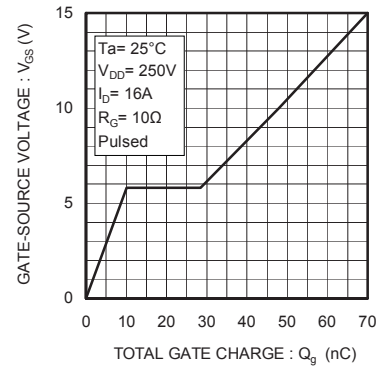


Fig.12 Dynamic Input Characteristics

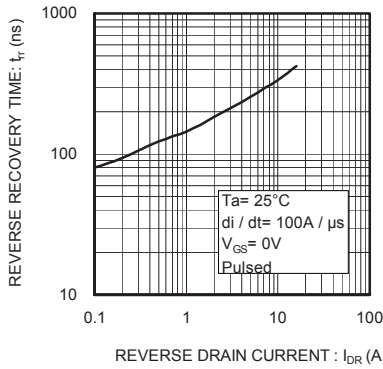


Fig.13 Reverse Recovery Time vs. Reverse Drain Current

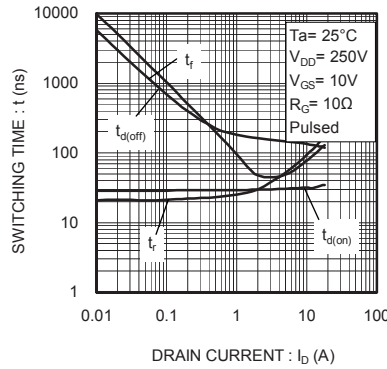


Fig.14 Switching Characteristics

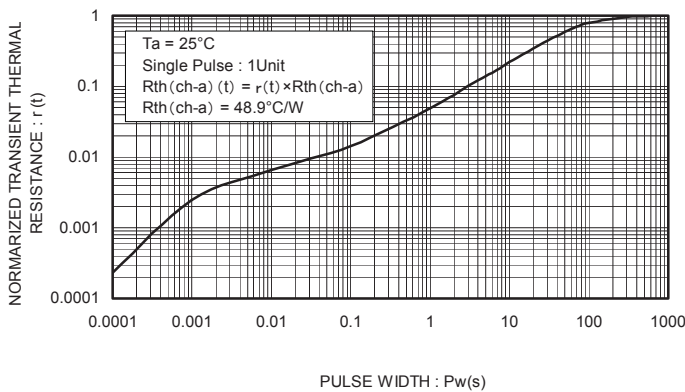


Fig.15 Normalized Transient Thermal Resistance vs. Pulse Width

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●Switching characteristics measurement circuit

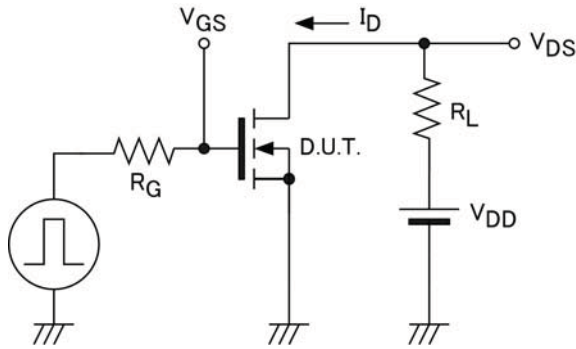


Fig.1 Switching time measurement circuit

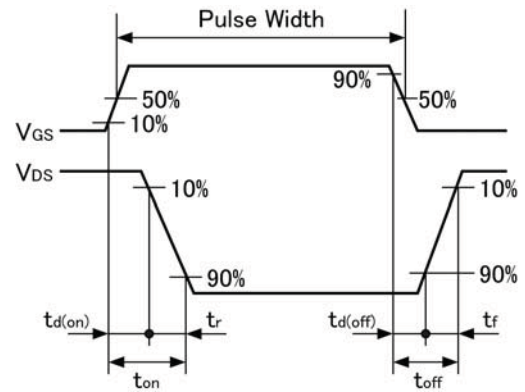


Fig.2 Switching waveforms

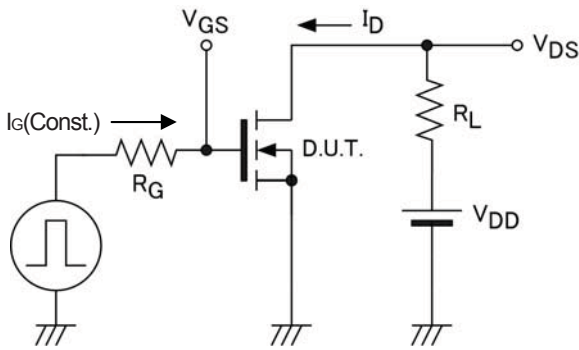


Fig.3 Gate charge measurement circuit

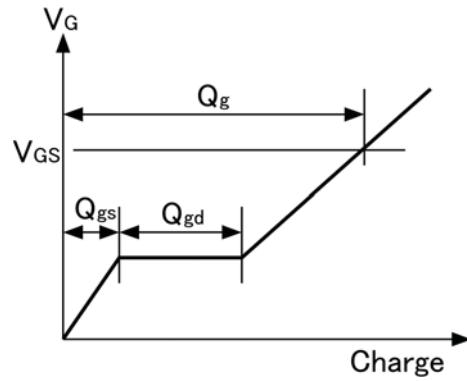


Fig.4 Gate charge waveform

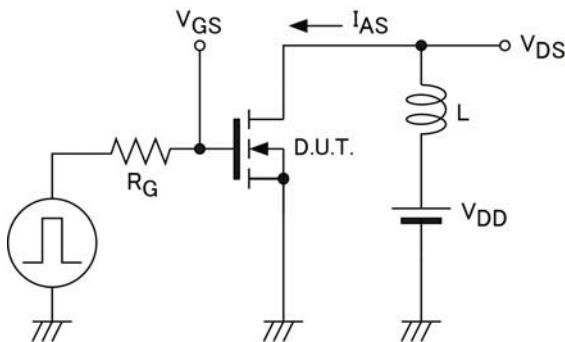


Fig.5 Avalanche measurement circuit

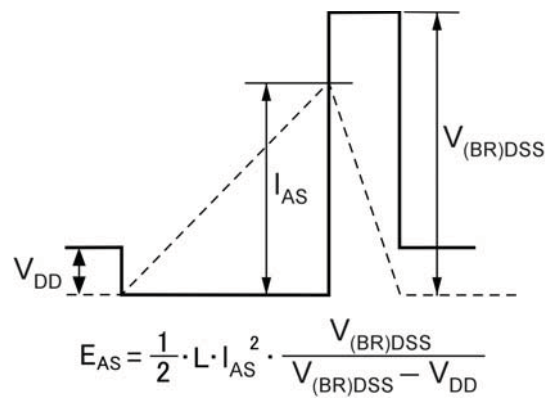


Fig.6 Avalanche waveform

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