

V_{DSS}	800V
$R_{DS(on)}$ (Max.)	0.56Ω
I_D	10A
P_D	40W

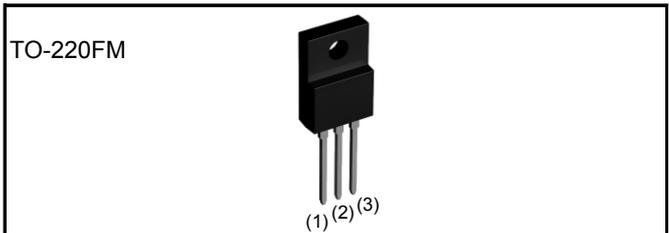
●Features

- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Gate-source voltage (V_{GSS}) guaranteed to be $\pm 30V$.
- 4) Drive circuits can be simple.
- 5) Parallel use is easy.
- 6) Pb-free lead plating ; RoHS compliant

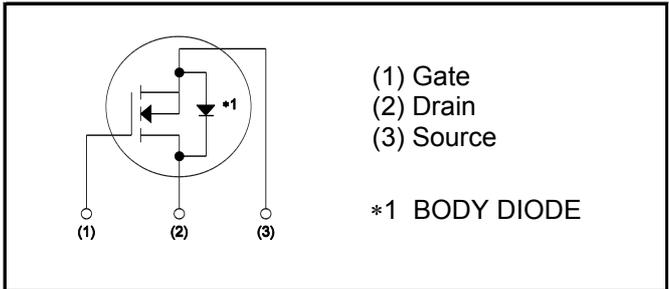
●Application

Switching Power Supply

●Outline



●Inner circuit



●Packaging specifications

Type	Packaging	Bulk
	Reel size (mm)	-
	Tape width (mm)	-
	Basic ordering unit (pcs)	500
	Taping code	-
	Marking	R8010ANX

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

Parameter	Symbol	Value	Unit
Drain - Source voltage	V_{DSS}	800	V
Continuous drain current	$T_c = 25^\circ C$	I_D^{*1}	± 10 A
	$T_c = 100^\circ C$	I_D^{*1}	± 4.6 A
Pulsed drain current	$I_{D,pulse}^{*2}$	± 40	A
Gate - Source voltage	V_{GSS}	± 30	V
Avalanche energy, single pulse	E_{AS}^{*3}	6.63	mJ
Avalanche energy, repetitive	E_{AR}^{*4}	2.7	mJ
Avalanche current	I_{AR}^{*3}	5	A
Power dissipation ($T_c = 25^\circ C$)	P_D	40	W
Junction temperature	T_j	150	$^\circ C$
Range of storage temperature	T_{stg}	-55 to +150	$^\circ C$
Reverse diode dv/dt	dv/dt ^{*5}	15	V/ns

●Absolute maximum ratings

Parameter	Symbol	Conditions	Values	Unit
Drain - Source voltage slope	dv/dt	$V_{DS} = 640V, I_D = 10A$ $T_j = 125^\circ C$	50	V/ns

●Thermal resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal resistance, junction - case	R_{thJC}	-	-	3.13	$^\circ C/W$
Thermal resistance, junction - ambient	R_{thJA}	-	-	70	$^\circ C/W$
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	$^\circ C$

●Electrical characteristics($T_a = 25^\circ C$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 1mA$	800	-	-	V
Drain - Source avalanche breakdown voltage	$V_{(BR)DS}$	$V_{GS} = 0V, I_D = 5A$	-	900	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 800V, V_{GS} = 0V$ $T_j = 25^\circ C$	-	0.1	100	μA
		$T_j = 125^\circ C$	-	-	1000	
Gate - Source leakage current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = 10V, I_D = 1mA$	3	-	5	V
Static drain - source on - state resistance	$R_{DS(on)}^{*6}$	$V_{GS} = 10V, I_D = 5A$ $T_j = 25^\circ C$	-	0.43	0.56	Ω
		$T_j = 125^\circ C$	-	0.95	-	
Gate input resistance	R_G	f = 1MHz, open drain	-	12.8	-	Ω

●Electrical characteristics($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Transconductance	g_{fs}^{*6}	$V_{DS} = 10\text{V}, I_D = 5.0\text{A}$	2.2	5.5	-	S
Input capacitance	C_{iss}	$V_{GS} = 0\text{V}$	-	1750	-	pF
Output capacitance	C_{oss}	$V_{DS} = 25\text{V}$	-	830	-	
Reverse transfer capacitance	C_{rss}	$f = 1\text{MHz}$	-	50	-	
Effective output capacitance, energy related	$C_{o(er)}$	$V_{GS} = 0\text{V}$ $V_{DS} = 0\text{V to } 640\text{V}$	-	48.0	-	pF
Effective output capacitance, time related	$C_{o(tr)}$		-	129	-	
Turn - on delay time	$t_{d(on)}^{*6}$	$V_{DD} \approx 400\text{V}, V_{GS} = 10\text{V}$ $I_D = 5\text{A}$ $R_L = 100\Omega$ $R_G = 10\Omega$	-	43	-	ns
Rise time	t_r^{*6}		-	54	-	
Turn - off delay time	$t_{d(off)}^{*6}$		-	97	194	
Fall time	t_f^{*6}		-	25	50	

●Gate Charge characteristics($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Total gate charge	Q_g^{*6}	$V_{DD} \approx 400\text{V}$	-	62	-	nC
Gate - Source charge	Q_{gs}^{*6}	$I_D = 10\text{A}$	-	17	-	
Gate - Drain charge	Q_{gd}^{*6}	$V_{GS} = 10\text{V}$	-	26	-	
Gate plateau voltage	$V_{(plateau)}$	$V_{DD} \approx 400\text{V}, I_D = 10\text{A}$	-	7.5	-	V

*1 Limited only by maximum temperature allowed.

*2 $P_W \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$

*3 $L \approx 500\mu\text{H}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, starting $T_j = 25^\circ\text{C}$

*4 $L \approx 500\mu\text{H}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, starting $T_j = 25^\circ\text{C}$, $f = 10\text{kHz}$

*5 Reference measurement circuits Fig.5-1.

*6 Pulsed

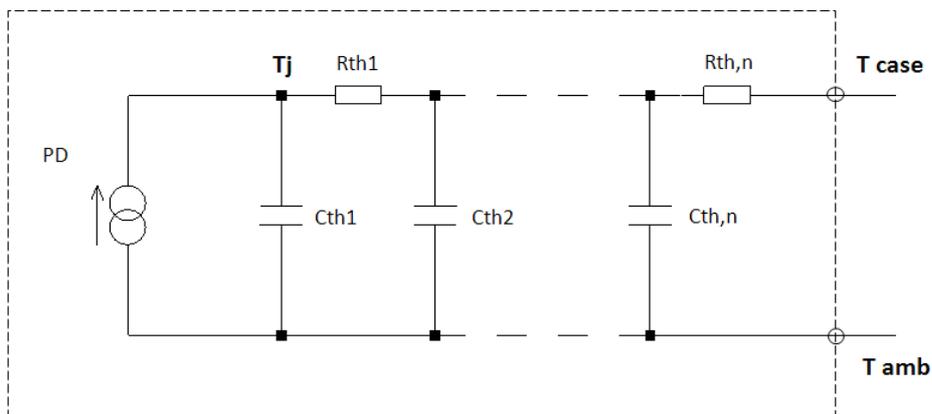
●Body diode electrical characteristics (Source-Drain)($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Inverse diode continuous, forward current	I_S^{*1}	$T_c = 25^\circ\text{C}$	-	-	10	A
Inverse diode direct current, pulsed	I_{SM}^{*2}		-	-	40	A
Forward voltage	V_{SD}^{*6}	$V_{GS} = 0\text{V}, I_S = 10\text{A}$	-	-	1.5	V
Reverse recovery time	t_{rr}^{*6}	$I_S = 10\text{A}$ $di/dt = 100\text{A}/\mu\text{s}$	-	595	-	ns
Reverse recovery charge	Q_{rr}^{*6}		-	9.2	-	μC
Peak reverse recovery current	I_{rrm}^{*6}		-	30.8	-	A
Peak rate of fall of reverse recovery current	di_{rr}/dt	$T_j = 25^\circ\text{C}$	-	170	-	$\text{A}/\mu\text{s}$

●Typical Transient Thermal Characteristics

Symbol	Value	Unit
R_{th1}	0.0922	K/W
R_{th2}	0.607	
R_{th3}	2.14	

Symbol	Value	Unit
C_{th1}	0.00393	Ws/K
C_{th2}	0.0547	
C_{th3}	0.53	



●Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve

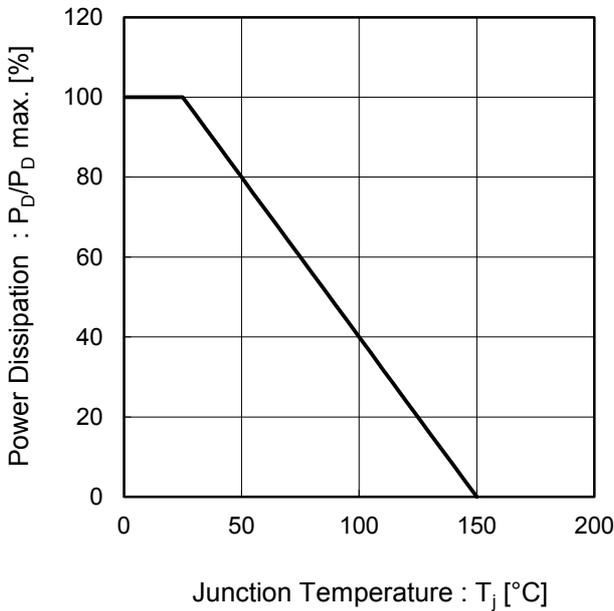


Fig.2 Maximum Safe Operating Area

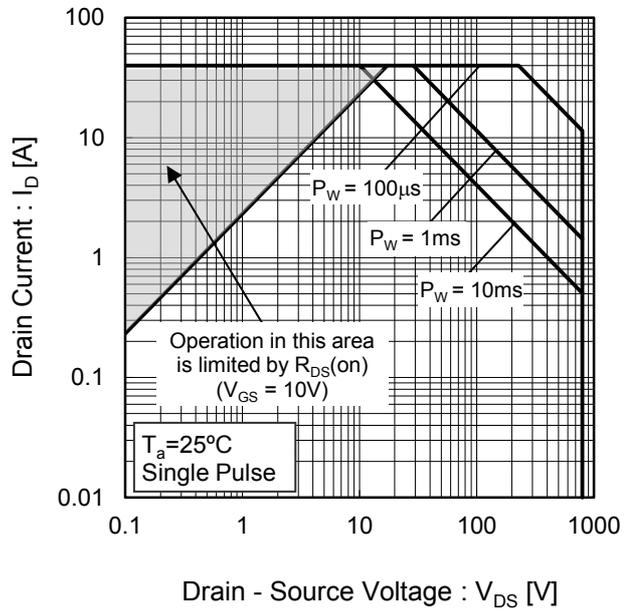
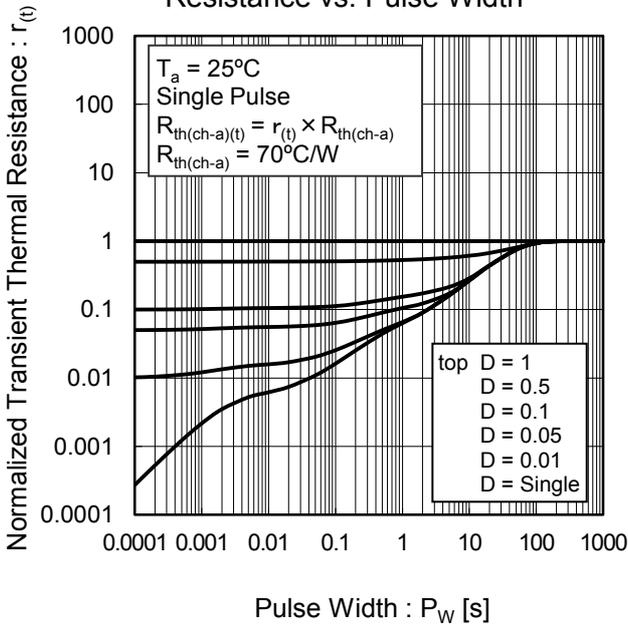


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width



●Electrical characteristic curves

Fig.4 Avalanche Current vs Inductive Load

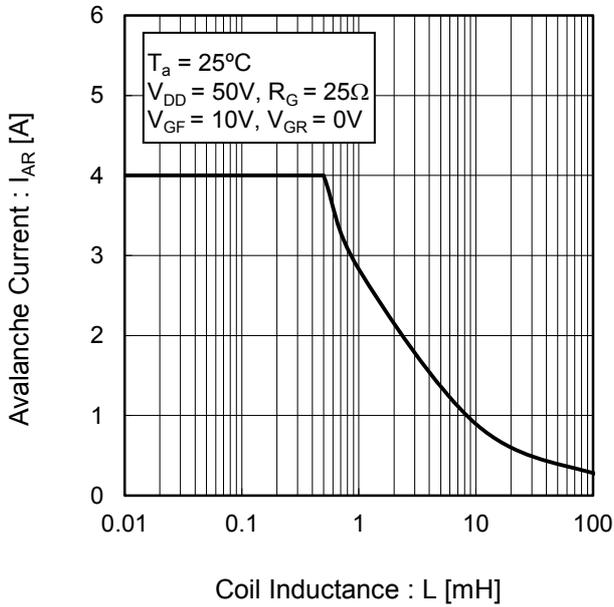


Fig.5 Avalanche Power Losses

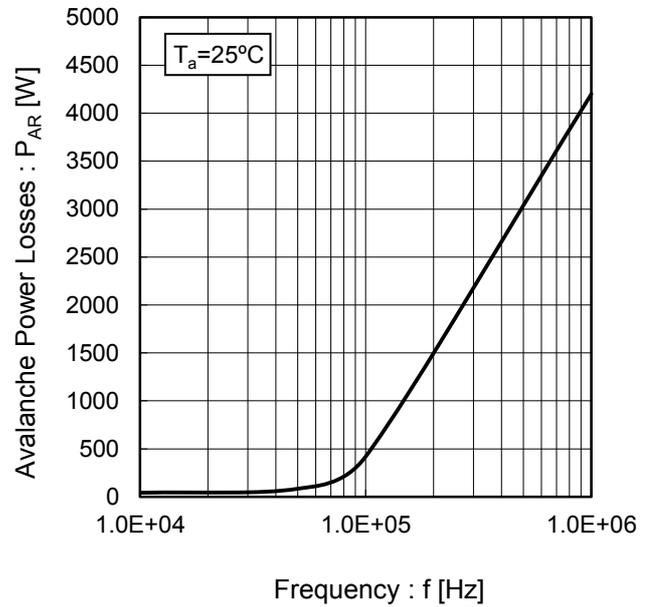
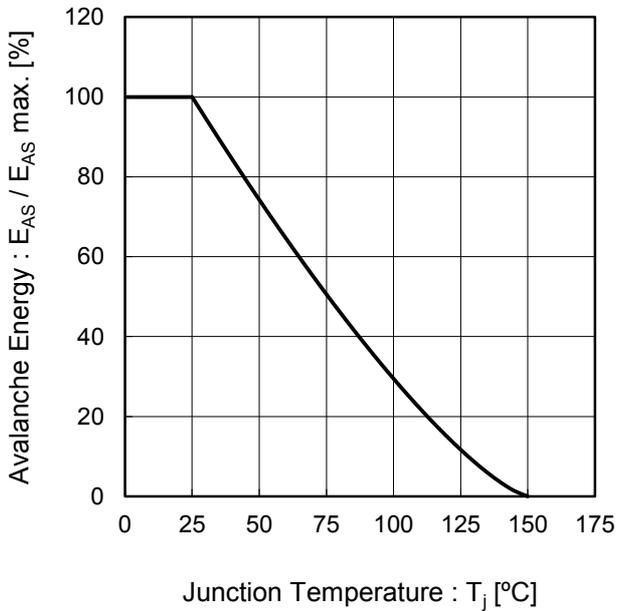


Fig.6 Avalanche Energy Derating Curve vs Junction Temperature



●Electrical characteristic curves

Fig.7 Typical Output Characteristics(I)

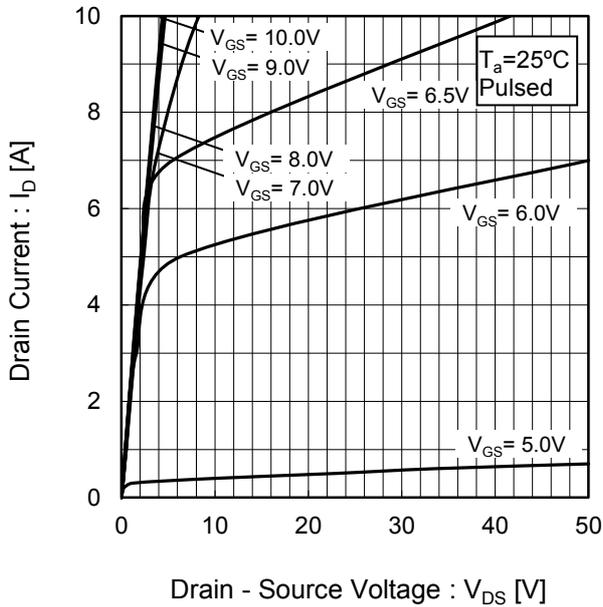


Fig.8 Typical Output Characteristics(II)

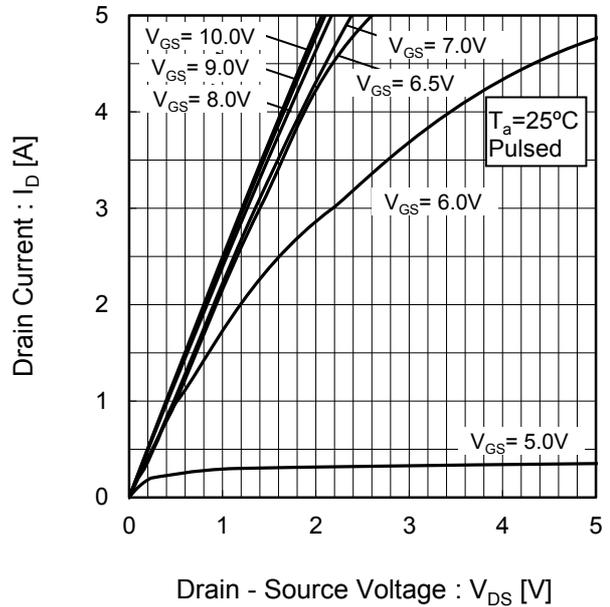


Fig.9 $T_j = 150^\circ\text{C}$ Typical Output Characteristics(I)

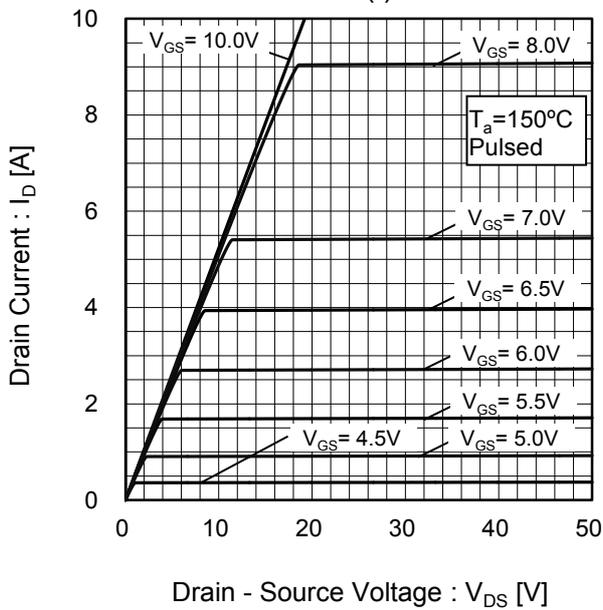
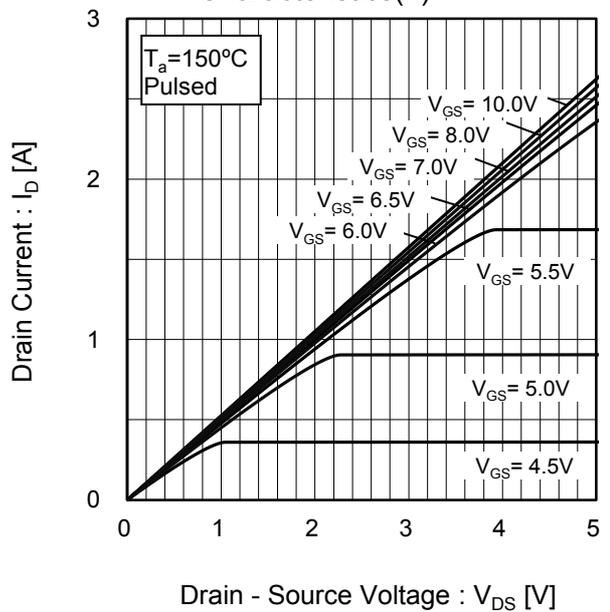


Fig.10 $T_j = 150^\circ\text{C}$ Typical Output Characteristics(II)



●Electrical characteristic curves

Fig.11 Breakdown Voltage vs. Junction Temperature

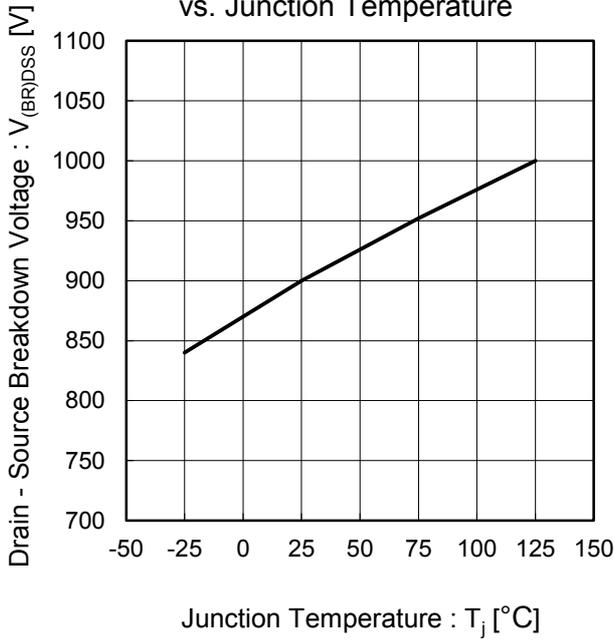


Fig.12 Typical Transfer Characteristics

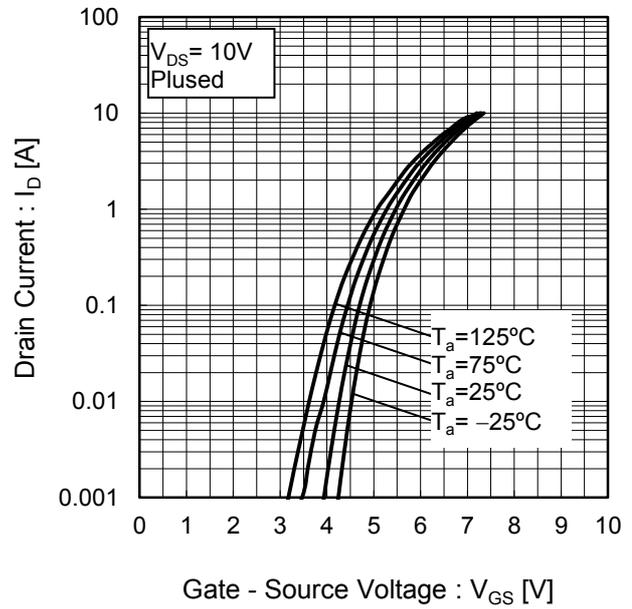


Fig.13 Gate Threshold Voltage vs. Junction Temperature

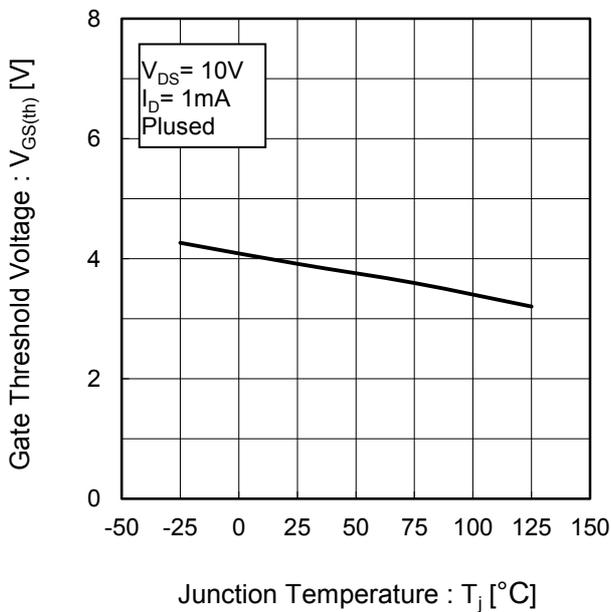
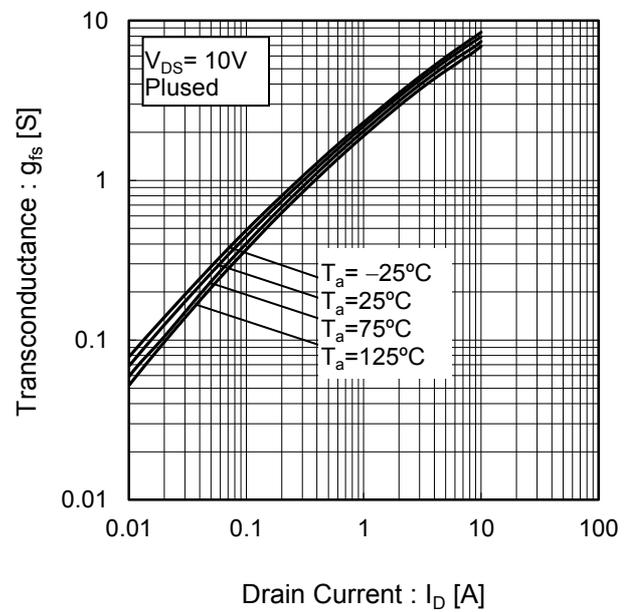


Fig.14 Transconductance vs. Drain Current



●Electrical characteristic curves

Fig.15 Static Drain - Source On - State Resistance vs. Gate Source Voltage

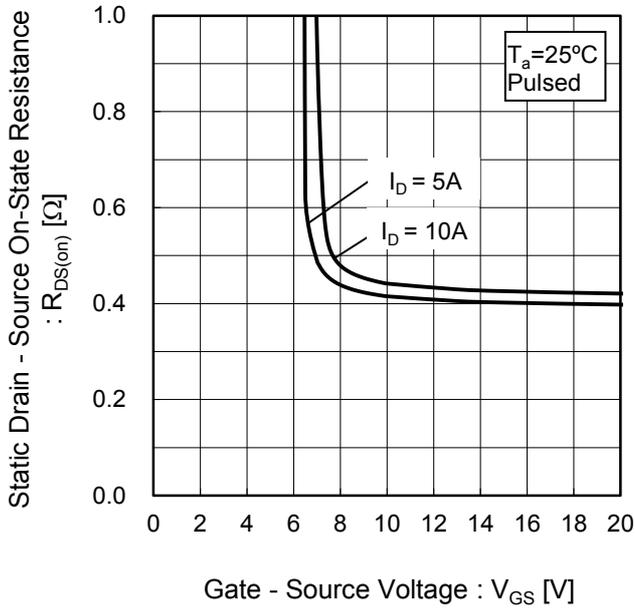


Fig.16 Static Drain - Source On - State Resistance vs. Junction Temperature

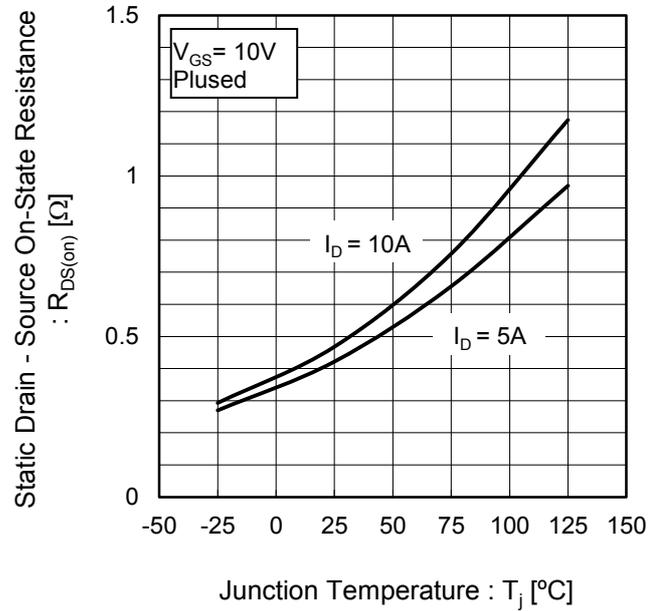
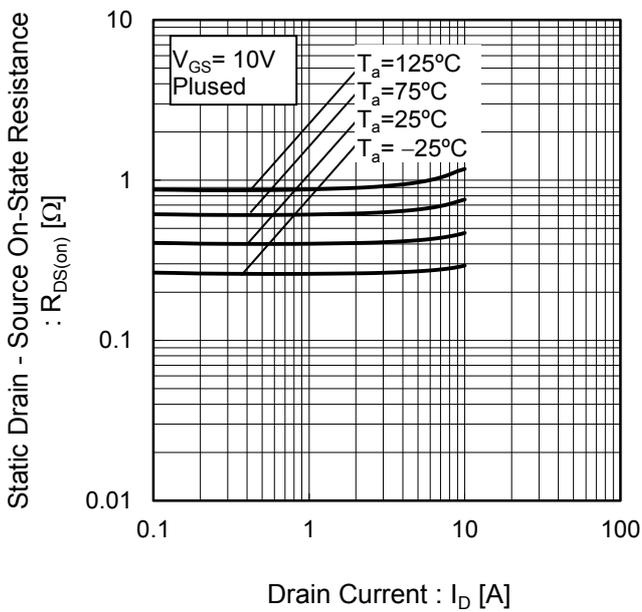


Fig.17 Static Drain - Source On - State Resistance vs. Drain Current



●Electrical characteristic curves

Fig.18 Typical Capacitance vs. Drain - Source Voltage

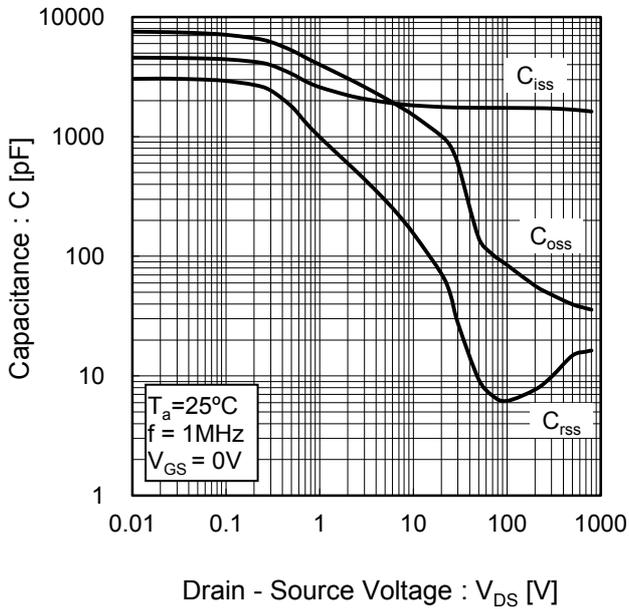


Fig.19 Coss Stored Energy

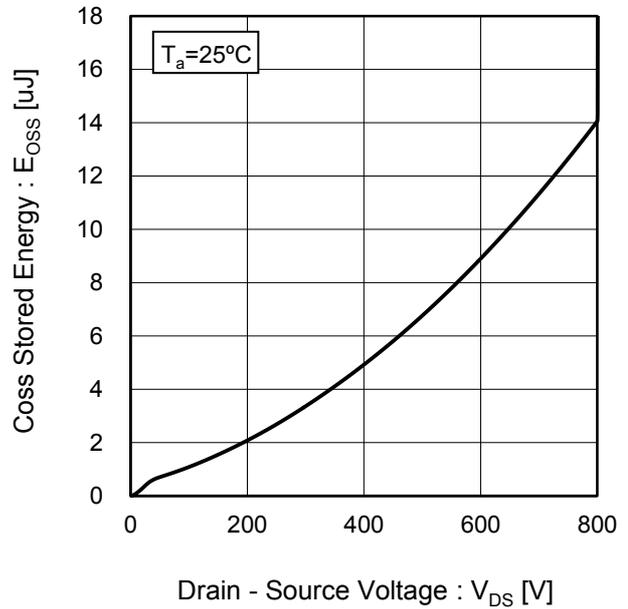


Fig.20 Switching Characteristics

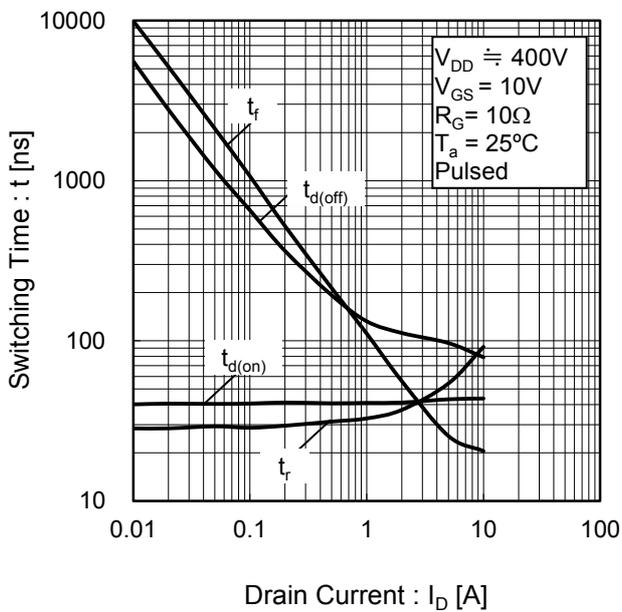
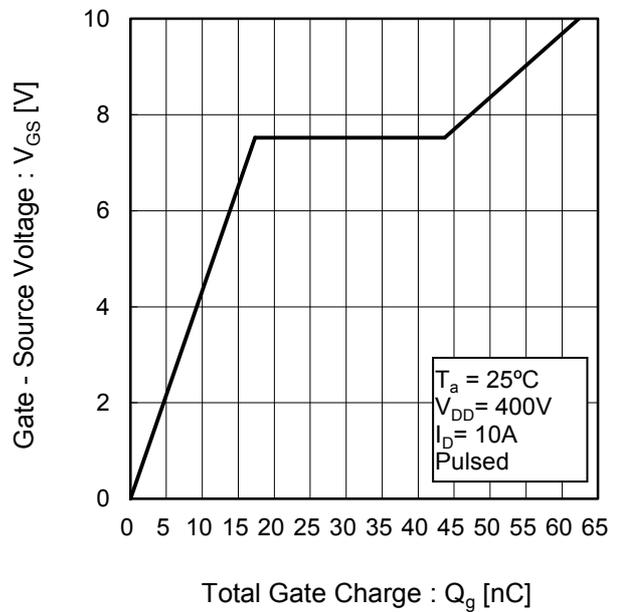


Fig.21 Dynamic Input Characteristics



●Electrical characteristic curves

Fig.22 Inverse Diode Forward Current vs. Source - Drain Voltage

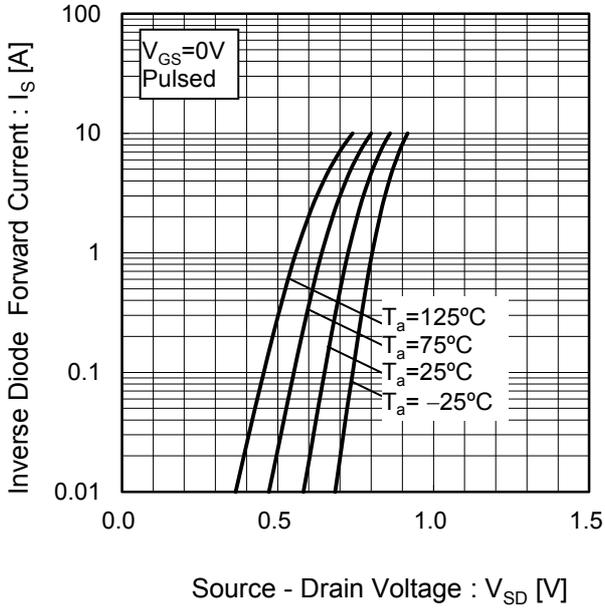
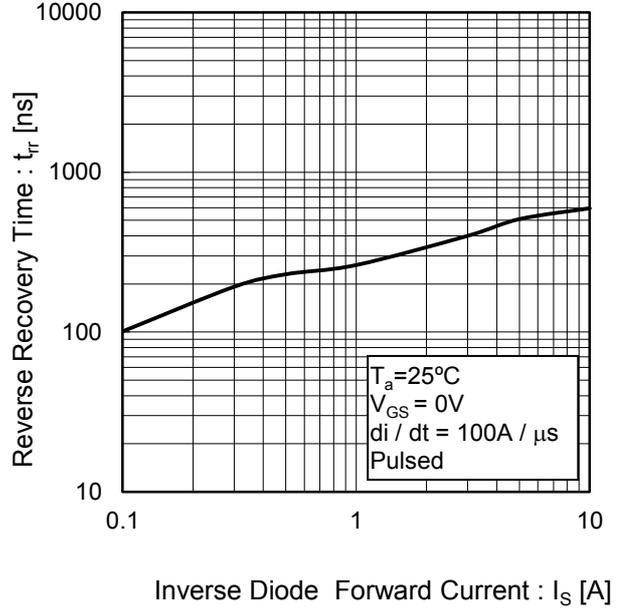


Fig.23 Reverse Recovery Time vs. Inverse Diode Forward Current



●Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

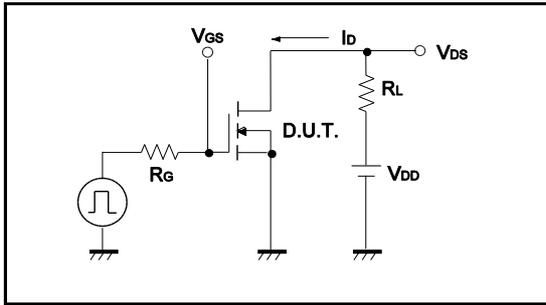


Fig.1-2 Switching Waveforms

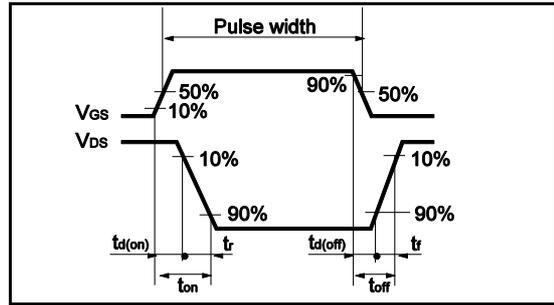


Fig.2-1 Gate Charge Measurement Circuit

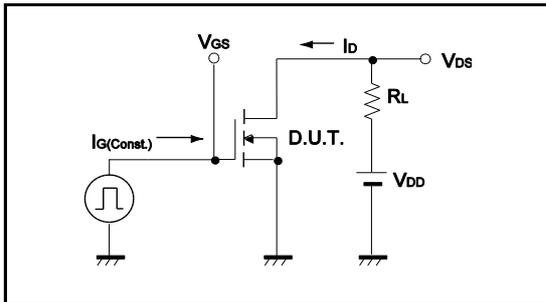


Fig.2-2 Gate Charge Waveform

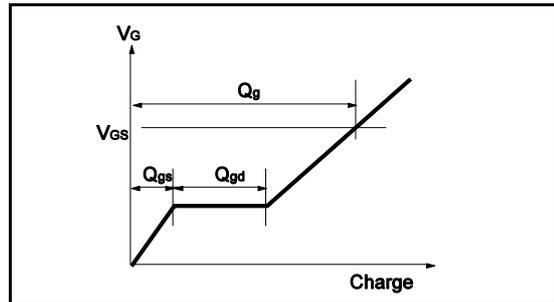


Fig.3-1 Avalanche Measurement Circuit

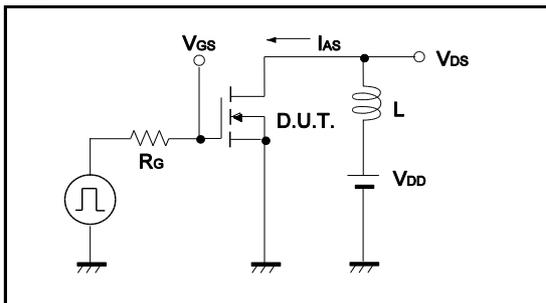


Fig.3-2 Avalanche Waveform

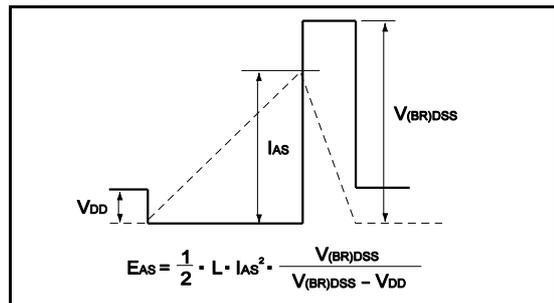


Fig.4-1 dv/dt Measurement Circuit

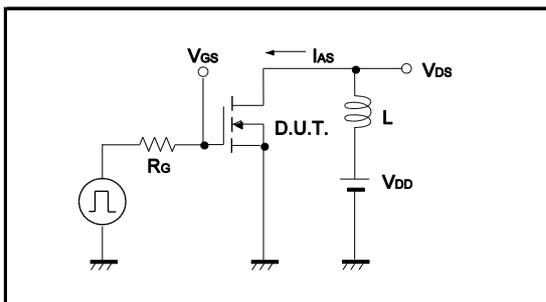


Fig.4-2 dv/dt Waveform

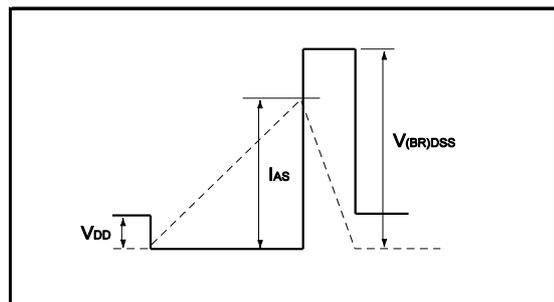


Fig.5-1 di/dt Measurement Circuit

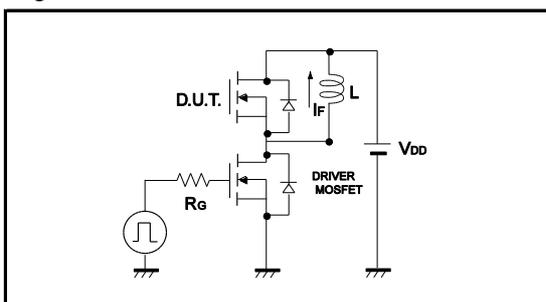
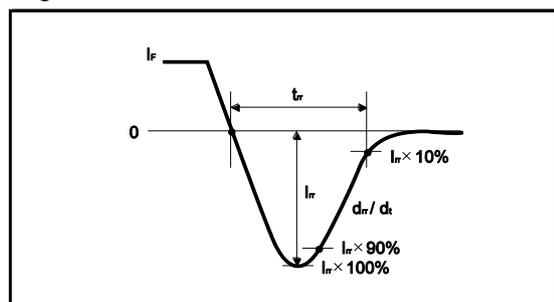
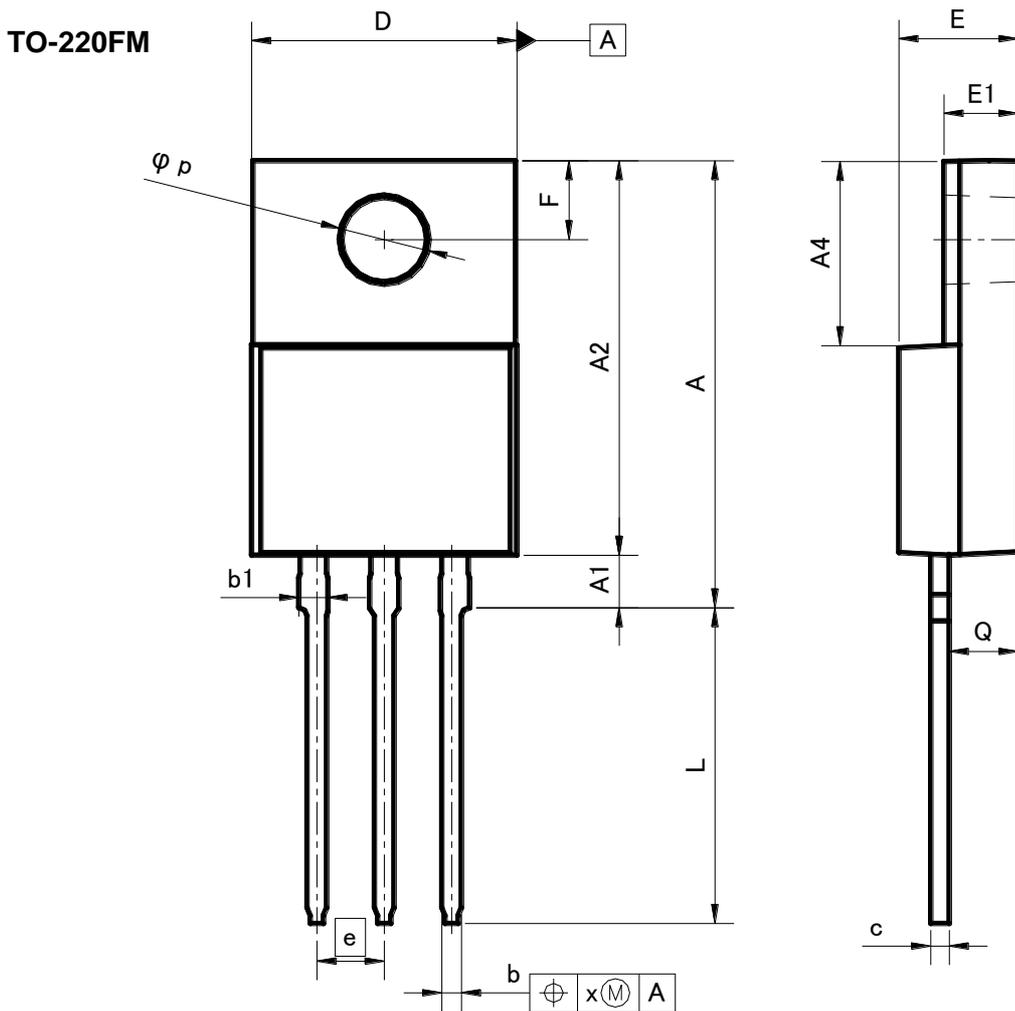


Fig.5-2 di/dt Waveform



●Dimensions (Unit : mm)



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	16.60	17.60	0.654	0.693
A1	1.80	2.20	0.071	0.087
A2	14.80	15.40	0.583	0.606
A4	6.80	7.20	0.268	0.283
b	0.70	0.85	0.028	0.033
b1	1.10	1.50	0.043	0.059
c	0.70	0.85	0.028	0.033
D	9.90	10.30	0.390	0.406
E	4.40	4.80	0.173	0.189
e	2.54		0.100	
E1	2.70	3.00	0.106	0.118
F	2.80	3.20	0.110	0.126
L	11.50	12.50	0.453	0.492
p	3.00	3.40	0.118	0.134
Q	2.10	3.10	0.083	0.122
x	-	0.38	-	0.015

Dimension in mm / inches

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- 3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. ROHM shall have no responsibility for any damages arising out of the use of our Products beyond the rating specified by ROHM.
- 4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.
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- Поставка более 17-ти миллионов наименований электронных компонентов;
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- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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