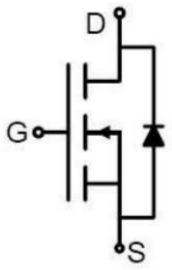
Features

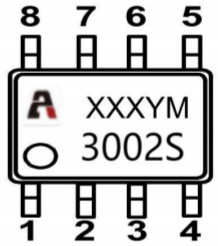
- 30V,15A
  $R_{DS(ON)}$ <4mΩ @V_{GS}=10V TYP:2.8mΩ
  $R_{DS(ON)}$ <5.8mΩ @V_{GS}=4.5V TYP:4.4mΩ
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge

Applications

- PWM applications
- Load Switch
- Power management



Schematic Diagram



SOP-8

Marking and pin Assignment

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
3002S	AP3002S	SOP-8	-	-	4000

ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (Tc=25℃)(1)	I_D	15	A
Continuous Drain Current (Tc=100℃)	I_D	9	A
Pulsed Drain Current (2,3)	I_{DM}	60	A
Drain Power Dissipation(1)	P_D	1.7	W
Single Pulsed Avalanche Energy	E_{AS}	108	mJ
Thermal Resistance from Junction to Ambient(1)	$R_{\theta JA}$	75	℃/W
Junction Temperature	T_J	-55~ +150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_j=25℃ unless otherwise noted)

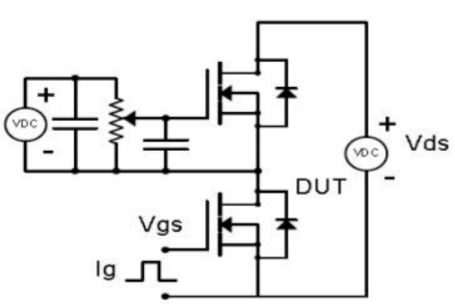
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =30V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.6	2.2	V
Drain-source on-resistance(4)	$R_{DS(on)}$	V_{GS} =10V, I_D =7A	-	2.8	4	mΩ
		V_{GS} =4.5V, I_D =6A	-	4.4	5.8	mΩ
Dynamic characteristics(5)						
Input Capacitance	C_{iss}	V_{DS} =15V, VGS=0V, f=1MHz	-	2500	3750	pF
Output Capacitance	C_{oss}		-	385	578	
Reverse Transfer Capacitance	C_{rss}		-	350	525	
Switching characteristics(5)						
Turn-on delay time	$t_{d(on)}$	V_{DD}=15V, I_D=7A, R_G=3Ω, V_{GS}=10V	-	12	18	nS
Turn-on rise time	t_r		-	8	12	
Turn-off delay time	$t_{d(off)}$		-	46	69	
Turn-off fall time	t_f		-	25	38	
Total Gate Charge	Qg	V_{DS}=15V, I_D=7A, V_{GS}=10V	-	49	74	nC
Gate-Source Charge	Qgs		-	6.5	10	
Gate-Drain Charge	Qgd		-	14	21	
Source-Drain Diode characteristics						
Diode Forward voltage(4)	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=7A	-	-	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	15	A
Body Diode Reverse Recovery Time	trr	T_J=25℃, I_F=7A,di/dt=100A/us	-	14	21	nS
Body Diode Reverse Recovery Charge	Qrr		-	7.8	12	nC

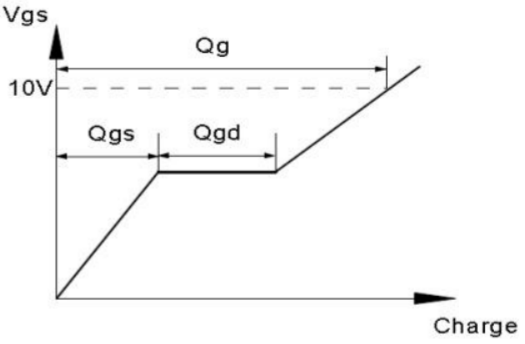
Notes:

1) Surface Mounted on 1 in² pad area, t ≤ 10 sec
2) Pulse width ≤ 10μs, duty cycle ≤ 1 %
3) Limited by bonding wire
4) Pulse width ≤ 300 μs, duty cycle ≤ 2%
5) Guaranteed by design, not subject to production testing

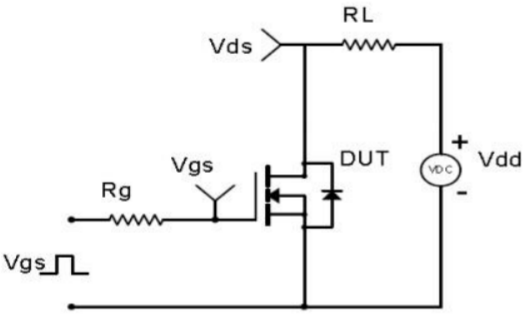
Test Circuit & Waveform

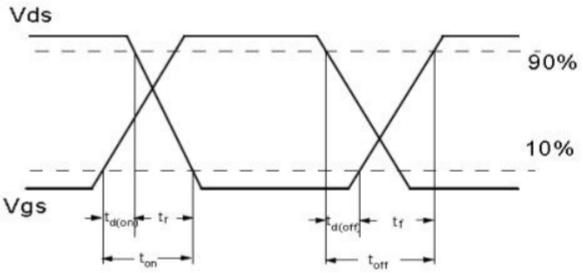
Gate Charge Test Circuit & Waveform



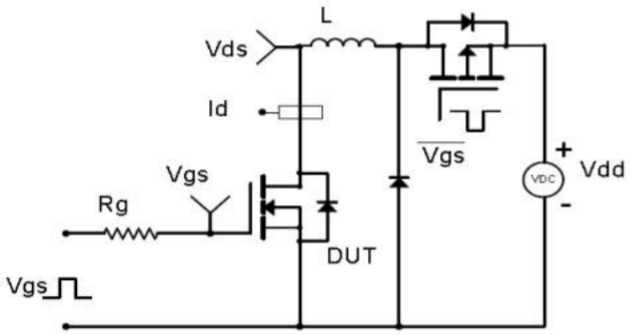


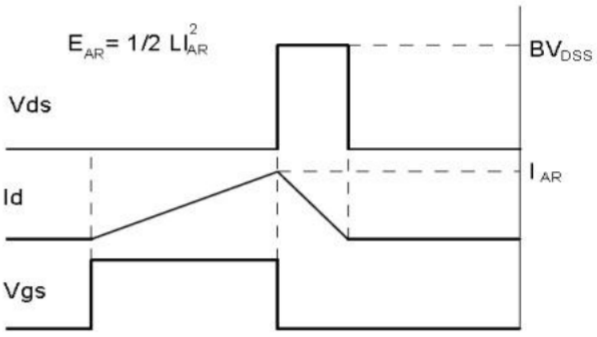
Resistive Switching Test Circuit & Waveforms



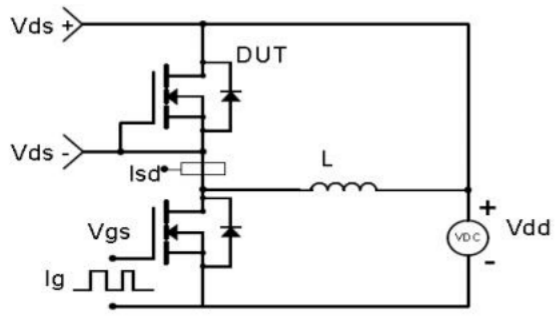


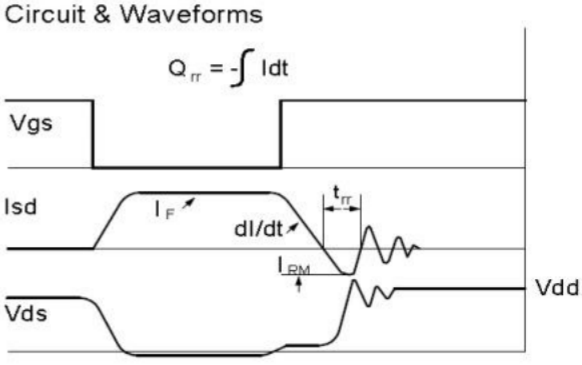
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





Typical Characteristics

Fig.1 Typical Output Characteristics

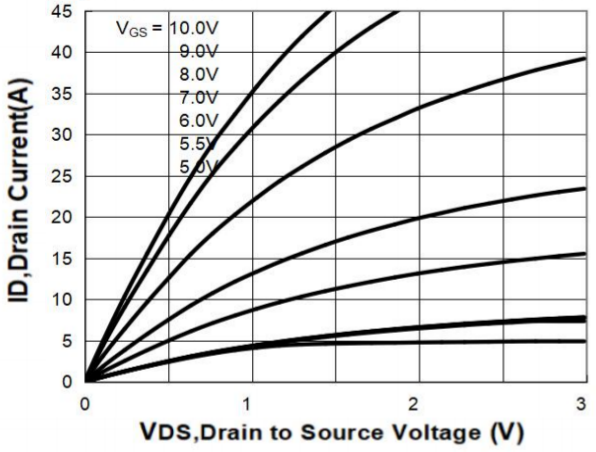


Fig. 2 Transconductance vs. Drain Current

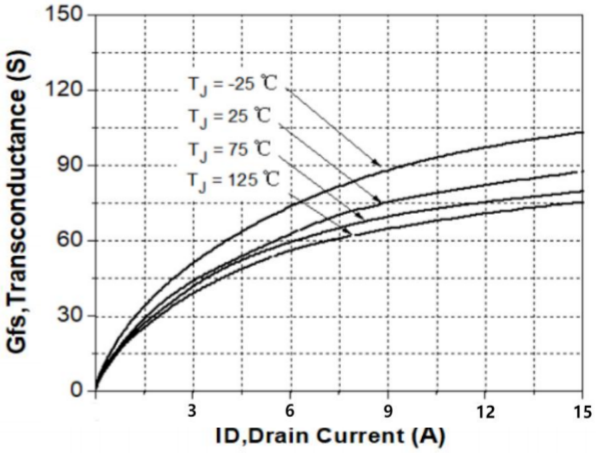


Fig.3 Typical Transfer Characteristics

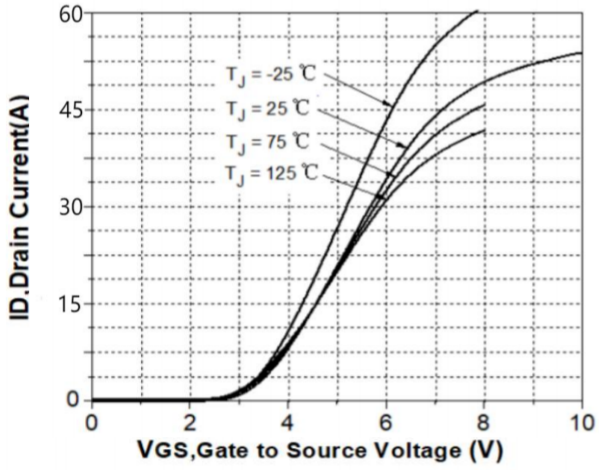


Fig. 4 State Resistance vs. Drain Current @-25℃

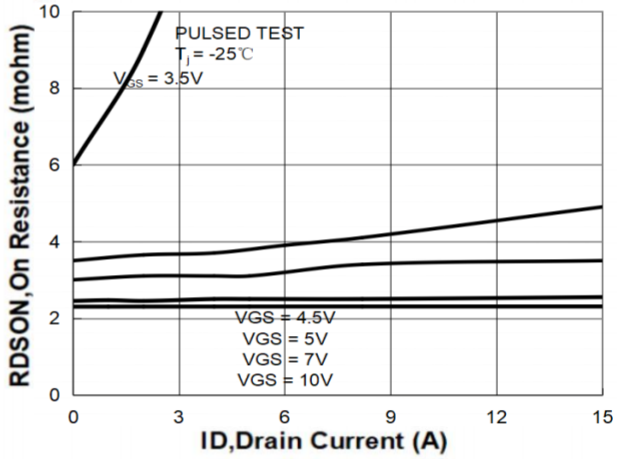


Fig.5 State Resistance vs. Drain Current @25℃

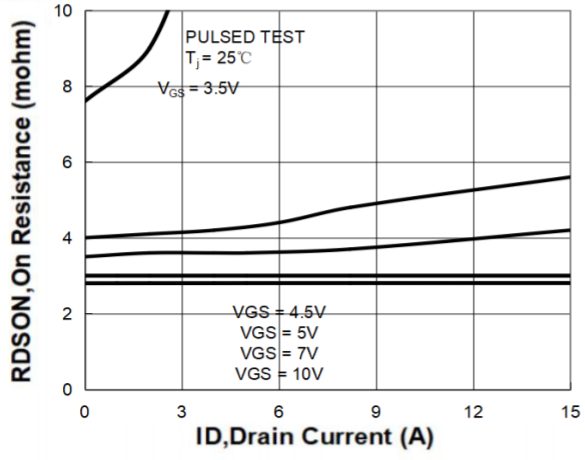
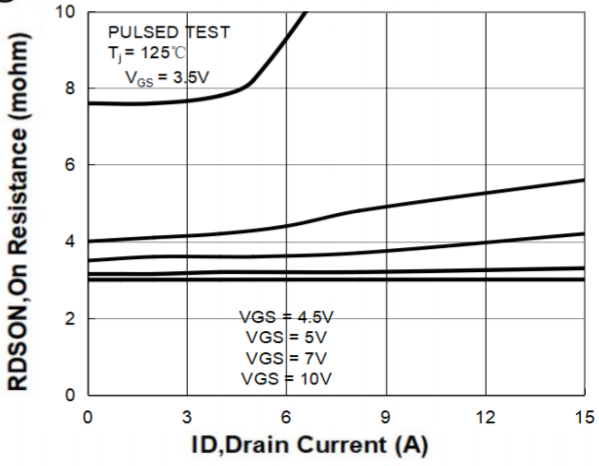


Fig. 6 State Resistance vs. Drain Current @125℃



Typical Characteristics

Fig.7 Breakdown Voltage vs. Junction Temperature

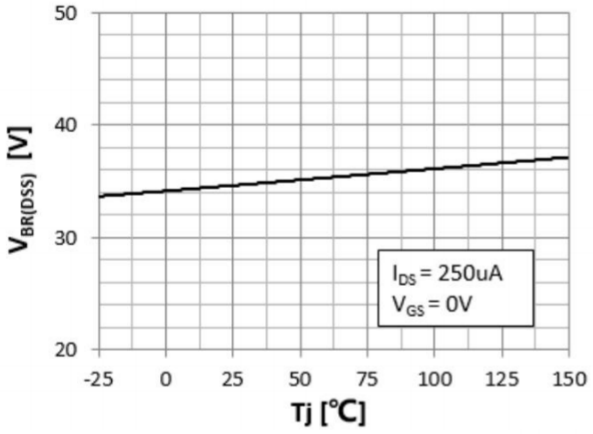


Fig. 8 Gate Threshold Voltage vs. Junction Temperature

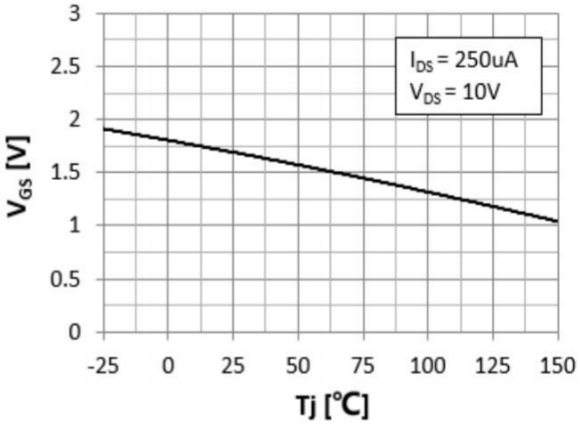


Fig.9 On-Resistance Variation vs. Junction Temperature

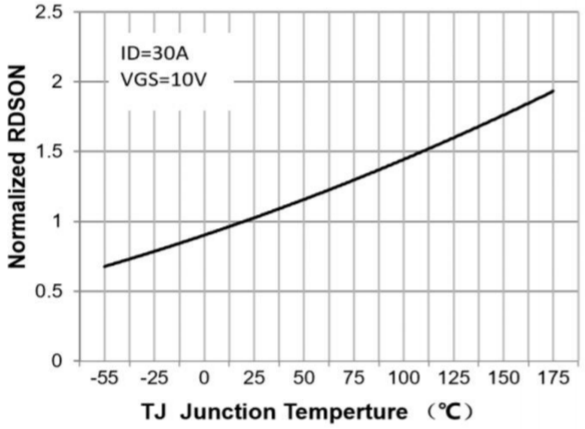


Fig.10 Maximum Drain Current vs .Case Temperature

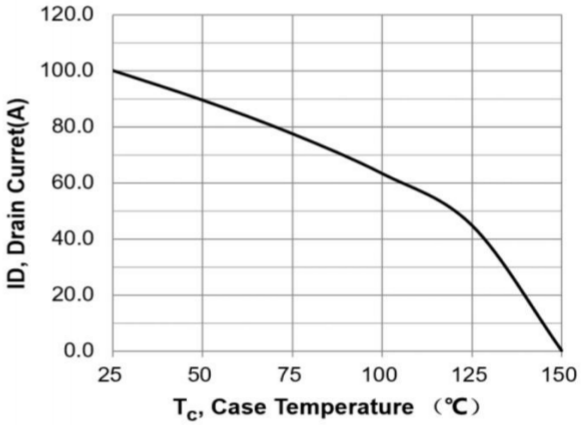


Fig.11 Power Dissipation Derating Curve

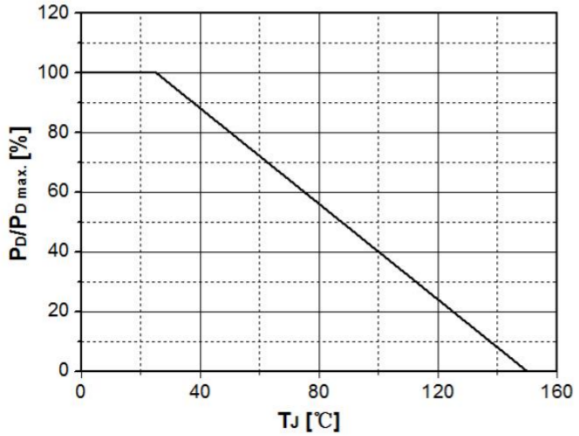
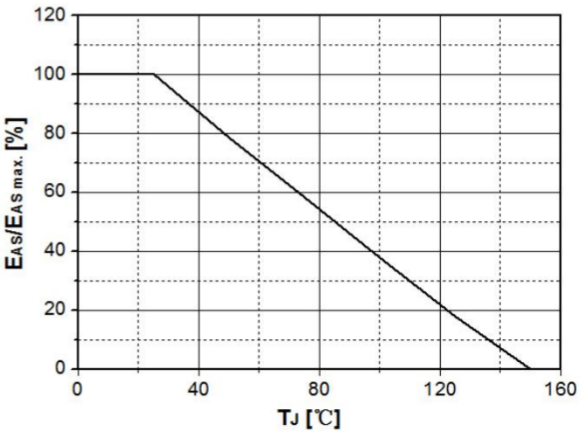


Fig.12 Avalanche Energy Derating Curve vs. Junction Temperature



Typical Characteristics

Fig.13 Typical Capacitance vs. Drain Source Voltage

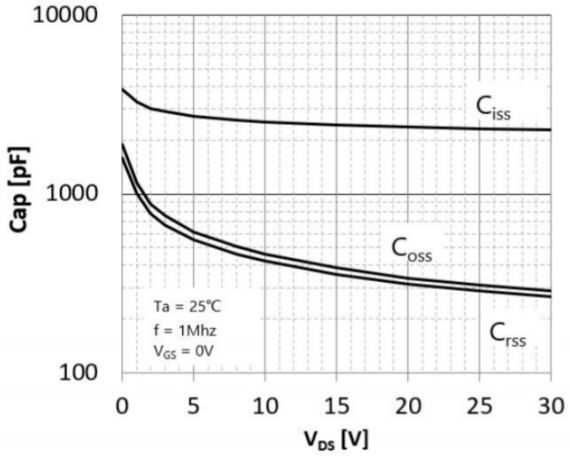


Fig.14 Dynamic Input Characteristics

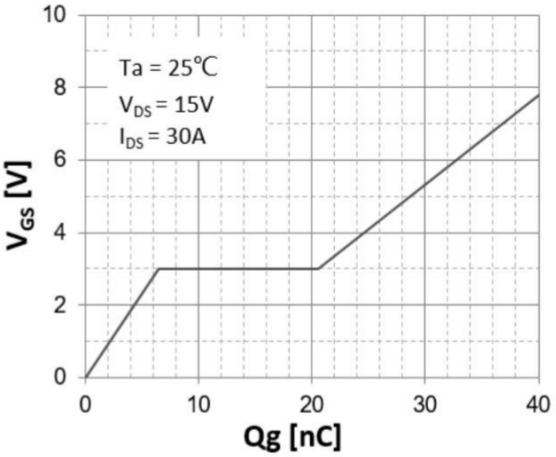
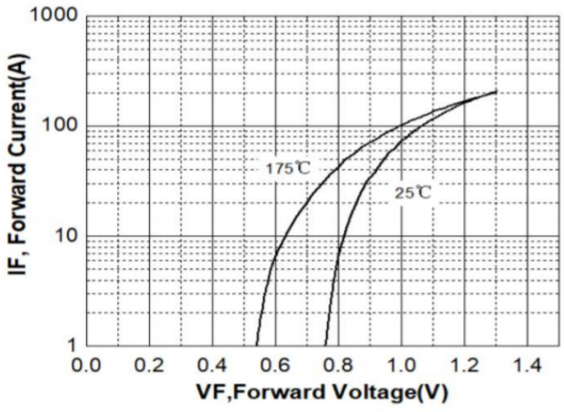


Fig.15 Body Diode Forward Voltage Vs Reverse Drain Current



Typical Characteristics

Fig.16 Safe Operating Area

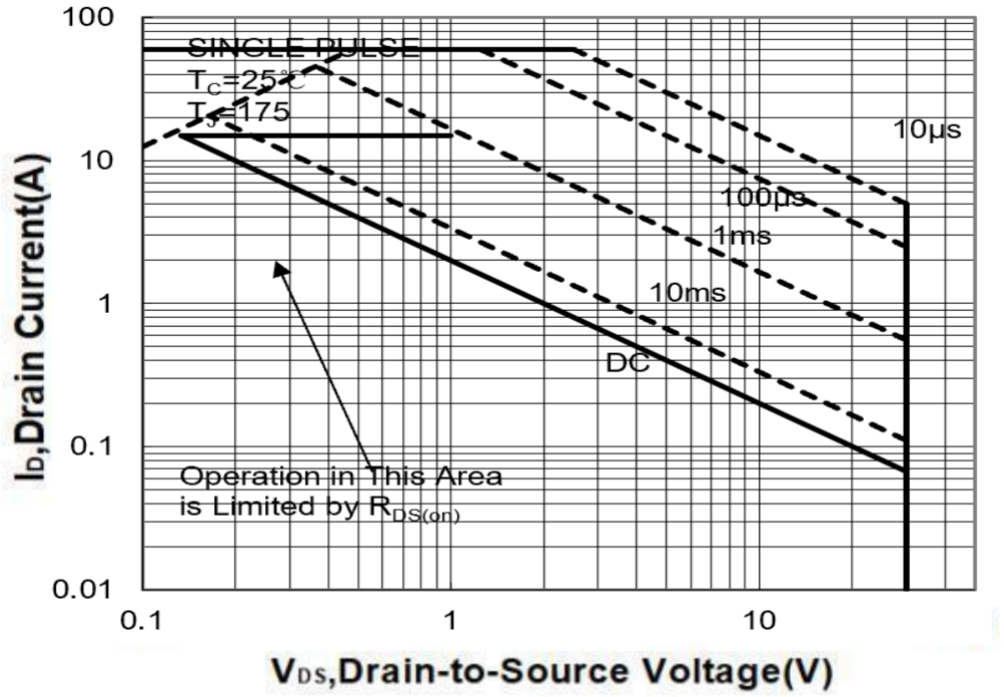
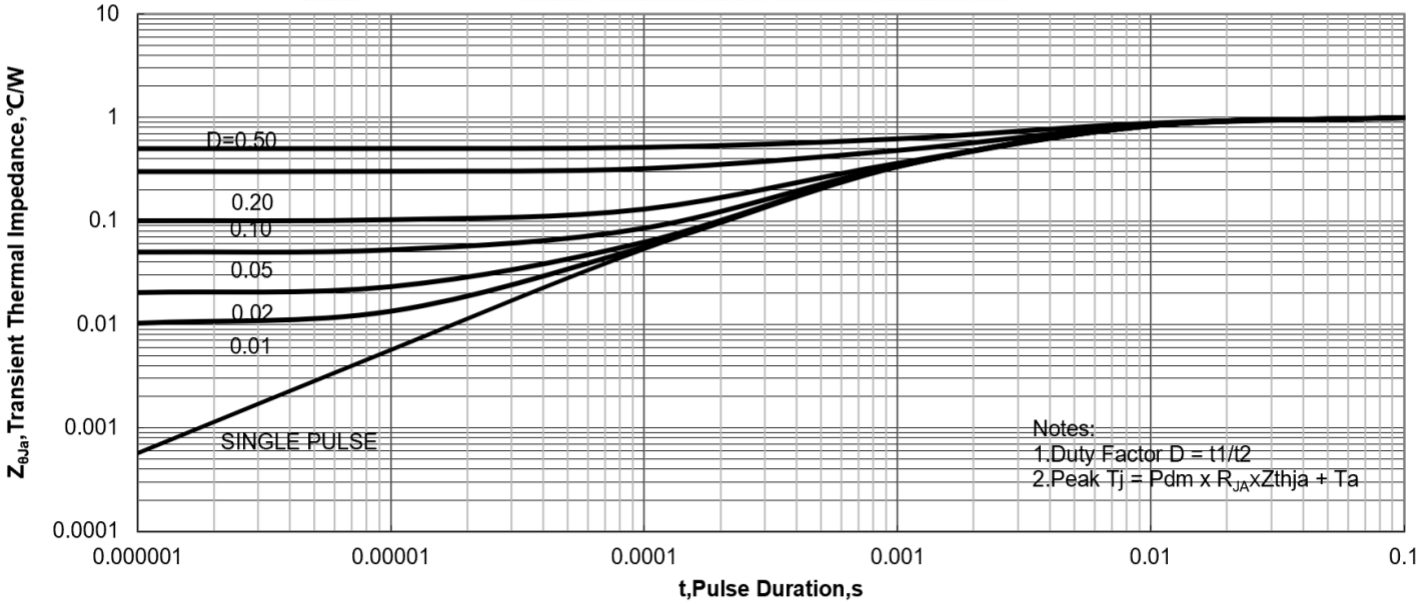
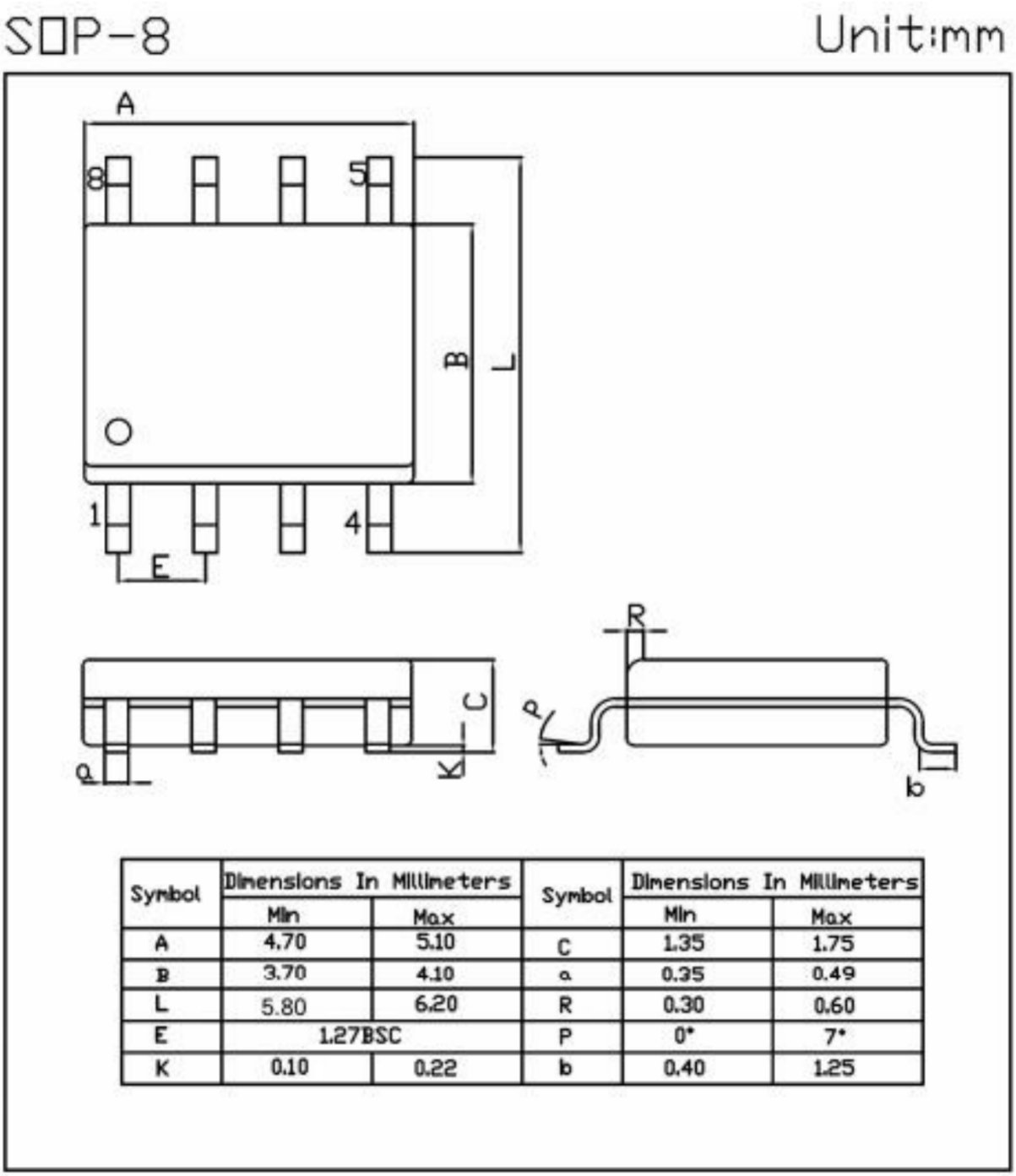


Fig. 17 Transient Thermal Response Curve



SOP-8 Package Information



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.70	5.10	C	1.35	1.75
B	3.70	4.10	α	0.35	0.49
L	5.80	6.20	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.10	0.22	b	0.40	1.25

Revision History

Revision	Release	Remark
V1.0	2024/01/19	Initial Release

Disclaimer

The information given in this document describes the independent performance of the product,but similar performance is not guaranteed under other working conditions,and cannot be guaranteed when installed with other products or equipment.To achieve the required performance of the product in actual scenarios,the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings,operating conditions,or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which
requires high reliability.Customers using or selling these products for use in medical,life-saving,or life-sustaining applications do so at their own risk and agree to fully indemnify.

Due to product or technical improvements,the information described or contained herein may be changed without prior notice.