Features

- Super Low Gate Charge
- Green Device Available
- 100% EAS Guaranteed
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

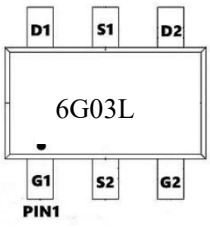
Bvdss	Rdson	ID
30V	18mΩ	6A
-30V	36mΩ	6A

Application

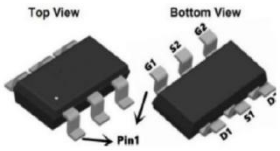
RoHS

- Power management in half bridge and inverters
- DC-DC Converter
- Load Switch

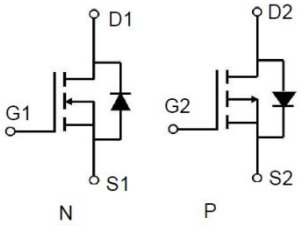
Package



1.Marking and pin assignment



2. SOT23-6L top view



3.Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
6G03L	6G03L	SOT23-6L	3000

Absolute Maximum Ratings (Tc=25℃unless otherwise specified)

Parameter		Symbol	Rating		Units
			N-Ch	P-Ch	
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{Gs}	±20	±20	V
Continuous Drain Current, V_{GS} @ 10V(1)	Tc = 25℃	I_D	6	-6	A
	Tc = 100℃	I_D	5	-4	A
Pulsed Drain Current (2)		I_{DM}	20	-12	A
Single Pulsed Avalanche Energy (3)		E_{As}	72	59	mJ
Avalanche Current		IAS	21	-19	A
Power Dissipation(4)	Tc = 25℃	P_d	2.5	-2.08	W
Junction Temperature		T_J	-55~+150	-55~+150	℃
Storage Temperature		T_{STG}	-55~+150	-55~+150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient(1)	$R_{\theta JA}$	85	℃/W
Thermal Resistance Junction-Case(1)	$R_{\theta JC}$	50	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL6G03L	SOT23-6L	G1,G2	D1,D2	S1,S2	Tape Reel

N-Channel Electrical Characteristics (Tj=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V , I_D=250uA	30	---	---	V
BVDSS Temperature Coefficient	$\triangle B_{VDSS}/\triangle TJ$	Reference to 25℃ , I_D=1mA	---	0.034	---	V/℃
Static Drain-Source On-Resistance2	$R_{DS(ON)}$	V_{GS}=10V , I_D=6A	---	18	25	mΩ
		V_{GS}=4.5V , I_D=5A	---	25	31	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	1.5	2.5	V
VGS(th) Temperature Coefficient	$\triangle V_{GS(th)}$		---	-5.8	---	mV/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS} =30V , V_{GS}=0V , TJ=25℃	---	---	1	uA
		V_{DS} =30V , V_{GS}=0V , TJ=55℃	---	---	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS} =0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS} =15V , I_D=5A	---	10	---	S
Gate Resistance	Rg	V_{DS} =24V , V_{GS}=0V , f=1MHz	---	2.5	---	Ω
Total Gate Charge (4.5V)	Qg	V_{DS} =20V , V_{GS}=4.5V , I_D=6A	---	7.2	---	nC
Gate-Source Charge	Qgs		---	1.4	---	
Gate-Drain Charge	Qgd		---	2.2	---	
Turn-On Delay Time	Td(on)	V_{DD}=12V , V_{GS}=10V , R_G=3.3Ω I_D=5A	---	3.9	---	ns
Rise Time	Tr		---	9.2	---	
Turn-Off Delay Time	Td(off)		---	14.5	---	
Fall Time	Tf		---	6.0	---	
Input Capacitance	Ciss	V_{DS} =25V ,V_{GS}=0V , f=1MHz	---	370	---	pF
Output Capacitance	Coss		---	54	---	
Reverse Transfer Capacitance	Crss		---	40	---	

Guaranteed Avalanche Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Single Pulse Avalanche Energy5	EAS	V_{DD}=25V , L=0.1mH , IAS=10A	16	---	---	mJ

Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current(1)(6)	I_S	V_G=V_D=0V , Force Current	---	---	6	A
Pulsed Source Curren(2)(6)	I_{SM}		---	---	20	A
Diode Forward Voltage(2)	V_{SD}	V_{GS}=0V , I_S=5A , TJ=25℃	---	---	1.2	V

Notes:

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper,t<10sec.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,IAS=10A

4.The power dissipation is limited by 150℃ junction temperature

5.The Min. value is 100% EAS tested guarantee.

6.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

P-Channel Electrical Characteristics (Tj=25℃ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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-Source Leakage	I_{GSS}	V_{DS}= 0V, V_{GS}= ±20V	-	-	±100	nA
Gate-Source Threshold voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= -250μA	-1	-1.5	-2.5	V
Drain-Source on-State Resistance3	$R_{DS(on)}$	V_{GS}= -10V, I_D= -4.1A	-	36	60	mΩ
		V_{GS}= -4.5V, I_D= -3A	-	50	85	
Input Capacitance	Ciss	V_{GS} = 0V , V_{DS}= -15V, f = 1.0MHz	-	530	-	pF
Output Capacitance	Coss		-	70	-	
Reverse Transfer Capacitance	Crss		-	56	-	
Total Gate Charge	Qg	V_{GS} = -10V, V_{DS}= -15V, I_D= -4.1A	-	6.8	-	nC
Gate−Source Charge	Qgs		-	1.0	-	
Gate− Drain Charge	Qgd		-	1.4	-	
Turn-on Delay Time	td(on)	V_{GS}= -10V, V_{DS}= -15V , RL= 15Ω ,R_{GEN}= 2.5Ω	-	14	-	ns
Rise Time	tr		-	61	-	
Turn-off Delay time	td(off)		-	19	-	
Fall Time	tf		-	10	-	
Diode Forward Voltage3	V_{SD}	IS = -4.1A, V_{GS} = 0V	-	-	-1.2	V
Continuous Source Current	I_S		-	-	-6.0	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

2. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

3. Pulse Test: Pulse width≤300 μ s, duty cycle≤2%.

4. This value is guaranteed by design hence it is not included in the production test.

N-Channel Typical Characteristics

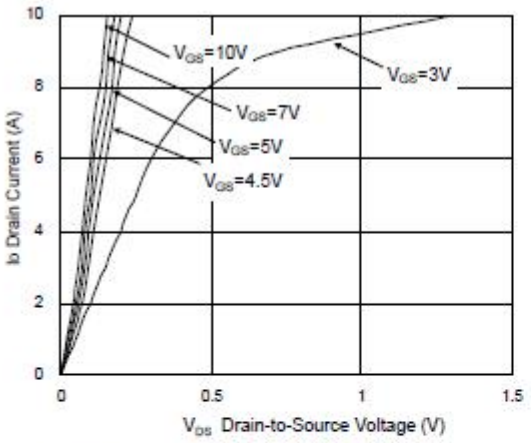


Fig.1 Typical Output Characteristics

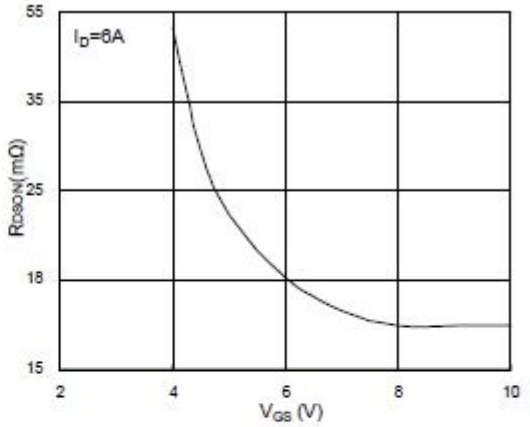


Fig.2 On-Resistance vs. G-S Voltage

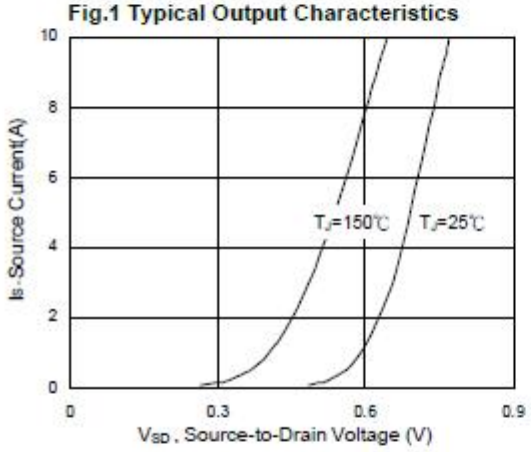


Fig.3 Forward Characteristics of Reverse

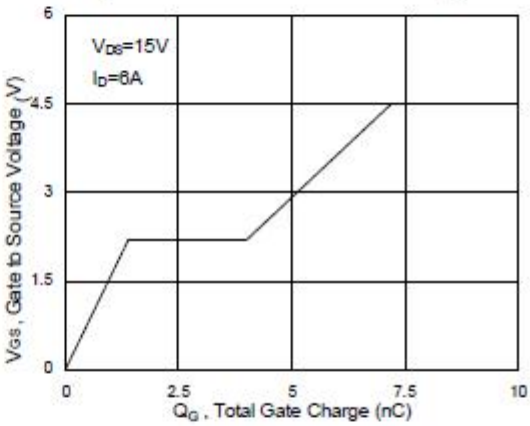
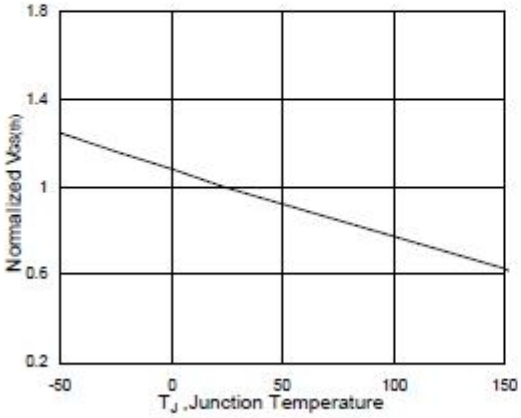


Fig.4 Gate-charge Characteristics



(℃) Fig.5 $V_{GS(th)}$ vs. T_J

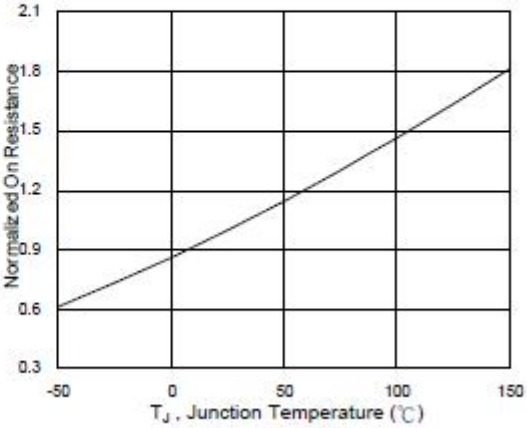


Fig.6 Normalized R_{DSON} vs. T_J

N-Channel Typical Characteristics

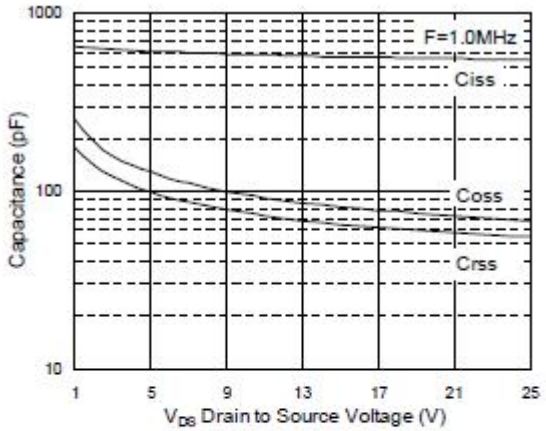


Fig.7 Capacitance

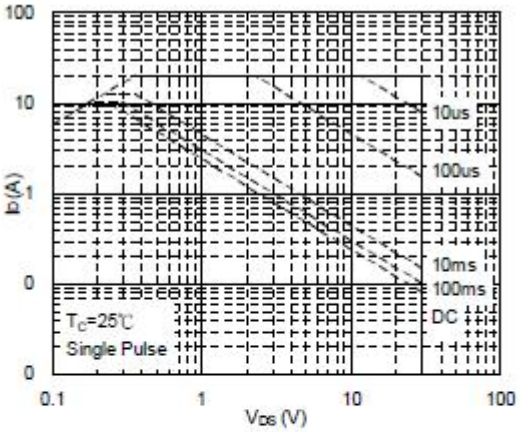


Fig.8 Safe Operating Area

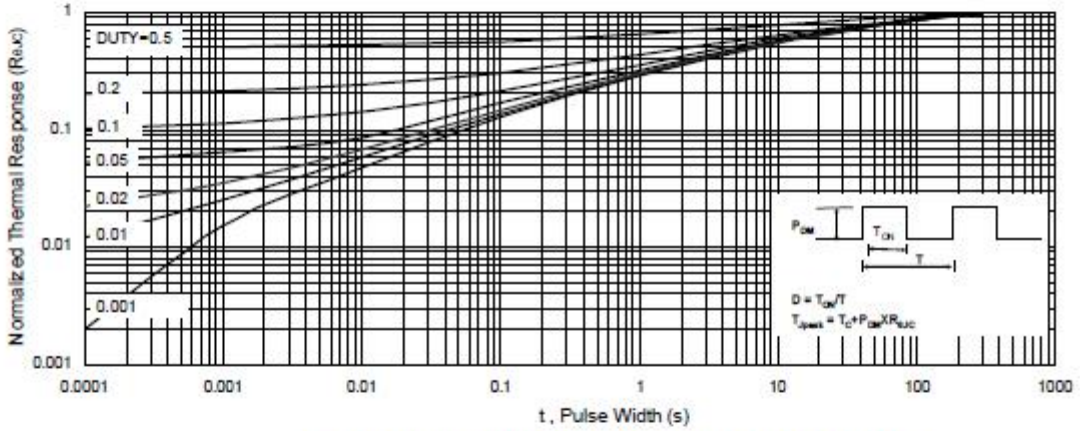


Fig.9 Normalized Maximum Transient Thermal Impedance

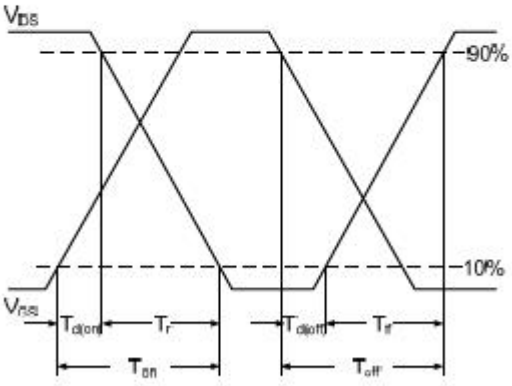


Fig.10 Switching Time Waveform

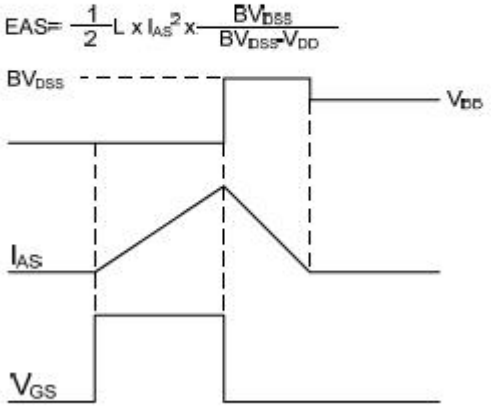


Fig.11 Unclamped Inductive Waveform

P-Channel Typical Characteristics

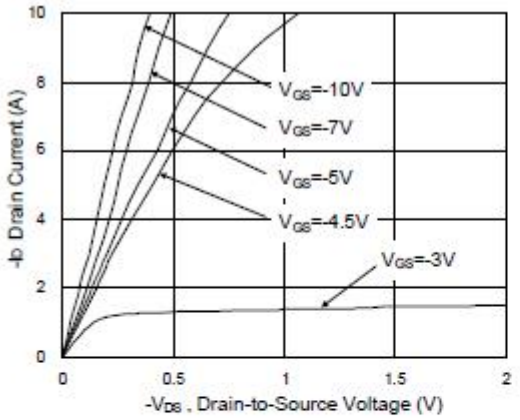


Fig.1 Typical Output Characteristics

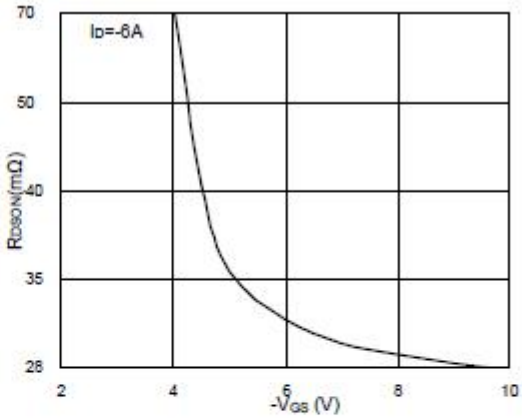


Fig.2 On-Resistance vs. Gate-Source

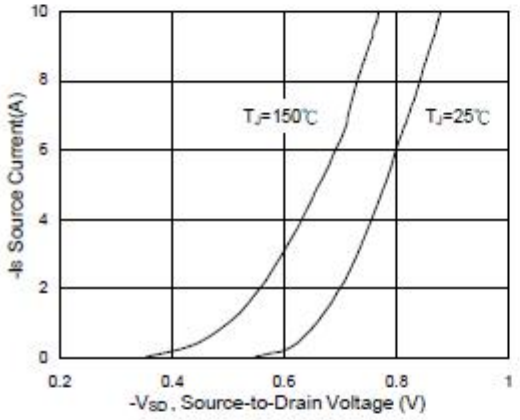


Fig.3 Forward Characteristics of Reverse

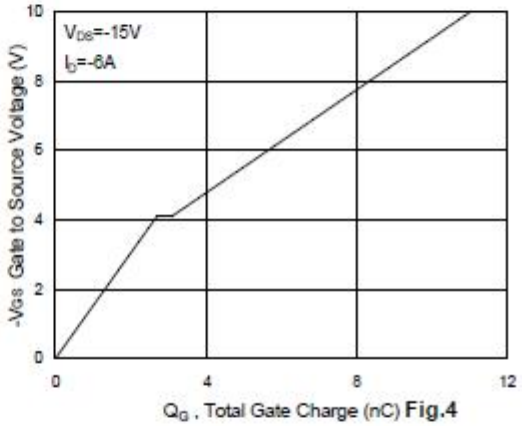


Fig.4 Gate-charge Characteristics

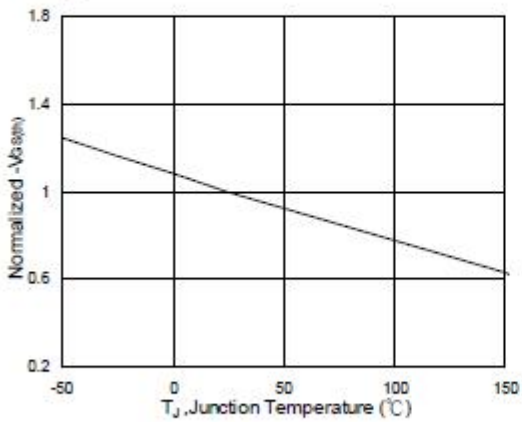


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

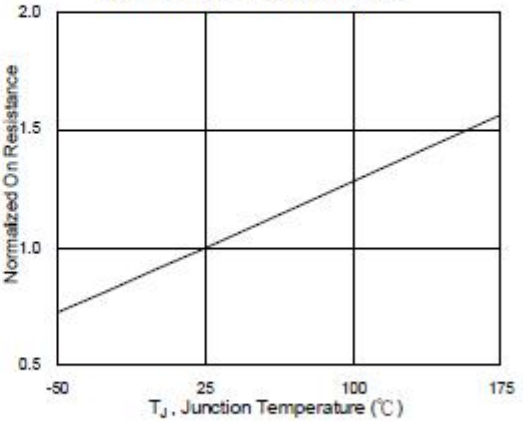


Fig.6 Normalized R_{DSON} vs. T_J

P-Channel Typical Characteristics

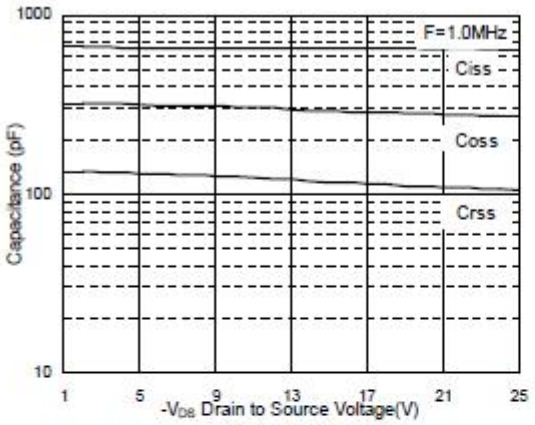


Fig.7 Capacitance

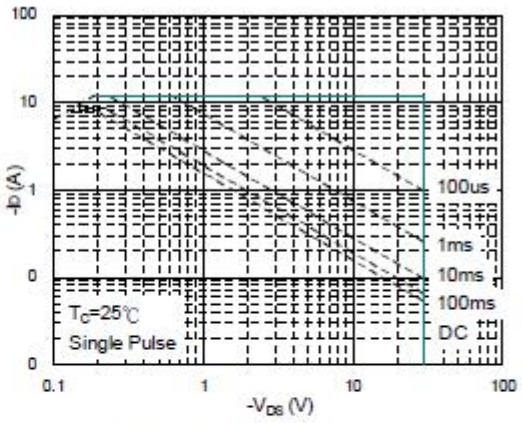


Fig.8 Safe Operating Area

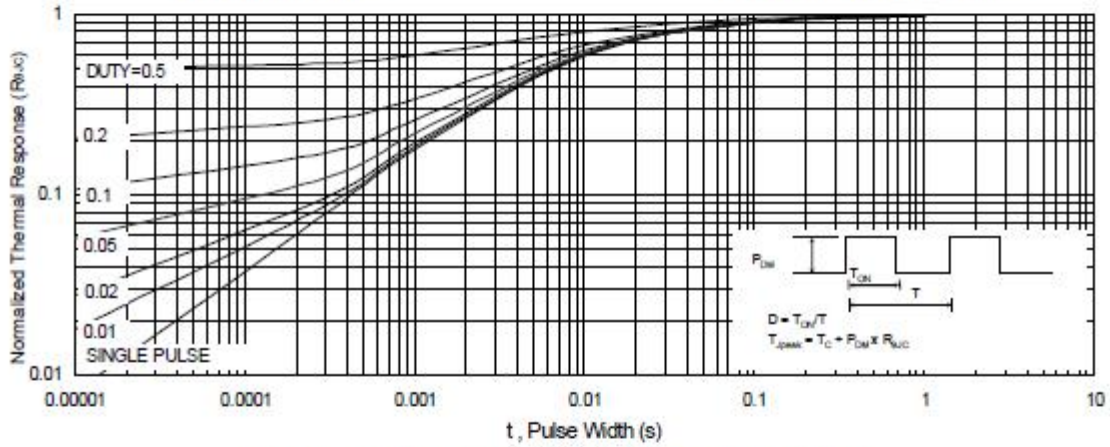


Fig.9 Normalized Maximum Transient Thermal Impedance

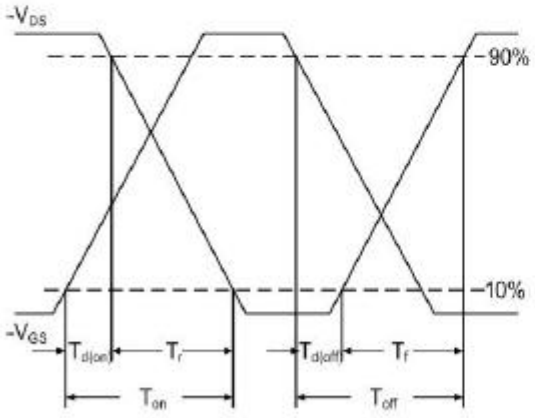


Fig.10 Switching Time Waveform

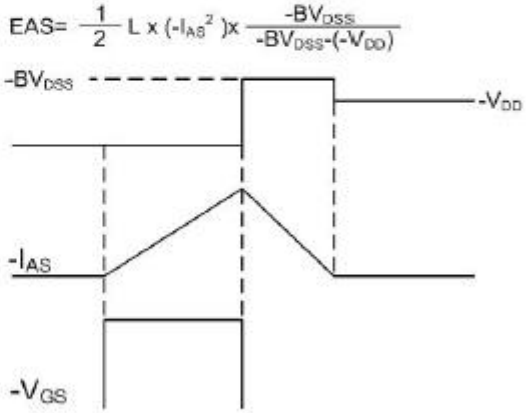
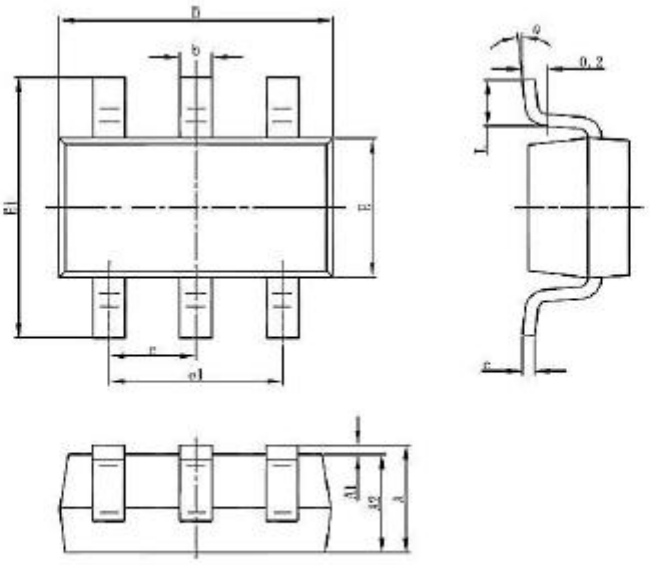


Fig.11 Unclamped Inductive Waveform

Package Dimensions

➢ SOT23-6L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
C	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950（BSC）		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0	8	0	8

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