

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	IRF7309
▶ Overseas	Part Number	IRF7309
▶ Equivalent	Part Number	IRF7309

EV is the abbreviation of name EVVO

V _{DSS} (V)	R _{DS (ON)}	I _{D(A)}
30	18mΩ(Typ)@V _{GS} =10V	7
-30	36mΩ(Typ)@V _{GS} =-10V	-6

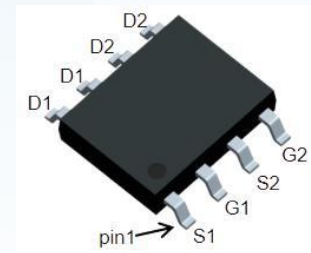
FEATURE:

- The IRF7309 is the highest performance trench N-ch and P-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

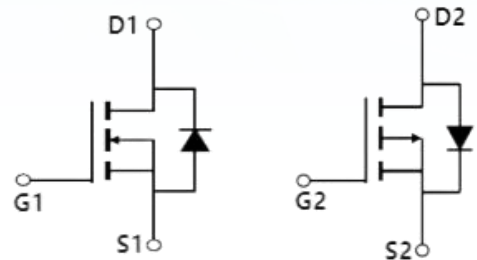
APPLICATIONS:

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

Pin Description



SOP-8



Absolute Maximum Ratings

Symbol	Parameter		Rating		Units
			N-Channel	P-Channel	
V _{DSS}	Drain-Source Voltage		30	-30	V
V _{GSS}	Gate-Source Voltage		±20	±20	V
I _D	Continuous Drain Current(V _{GS} = -4.5V)	T _A =25°C	7	-6	A
		T _A =70°C	6	-4	
T _J	Maximum Junction Temperature		150		°C
T _{STG}	Storage Temperature Range		-55 to 150		°C
I _{DM}	Pulsed Drain Current		20	-12	A
P _D	Maximum Power Dissipation	T _A =25°C	---	---	W
		T _A =70°C	---	---	
E _{AS}	Avalanche Energy, Single Pulsed		72	59	mJ
R _{θJC}	Thermal Resistance-Junction to Case		50		°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient		85		°C/W

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbo l	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250uA	30	---	---	V
VGS(th)	Gate threshold voltage	VDS=VGS,ID=250uA	1.0	1.5	2.5	V
RDS(ON)	Drain-Source On-state Resistance	VGS=10V , ID=6A	---	18	25	mΩ
		VGS=4.5V , ID=-5A	---	25	31	mΩ
IGSS	Gate-source leakage current	VGS=±12V , VDS=0V	---	---	±100	A
IDSS	Zero gate voltage drain current	VDS=20V,VGS=0V,TJ=25℃	---	---	1	μA
			TJ=55℃	---	---	
Dynamic Characteristic						
Ciss	Input Capacitance	VGS=0V, VDS=10V, Frequency=1.0MHz	---	370	---	pF
Coss	Output Capacitance		---	70	---	
Crss	Reverse Transfer Capacitance		---	57	---	
QG	Gate Total Charge	VDS=10V, VGS=5V, IDS=3A	---	7.2	---	nC
Qgs	Gate-Source charge		---	1.4	---	
Qgd	Gate-Drain charge		---	2.2	---	
td(on)	Turn-on delay time	VDD=10V , VGS=5V , RG=5Ω, ID=3A	---	3.9	---	ns
tr	Turn-on Rise Time		---	9.2	---	
td(off)	Turn-off Delay Time		---	14.5	---	
tf	Turn-off Fall Time		---	6.0	---	
RG	Gate Resistance	VGS=0V,VDS=0V,F=1MHz	---	2.5	---	Ω
Diode Characteristics						
VSD	Diode Forward Voltage	VGS=0V , IS=1A , TJ=25℃	---	---	1.2	V
trr	Reverse Recovery Time	ISD=4.1A, dISD/dt=-100A/μs	---	---	---	ns
Qrr	Reverse Recovery Charge		---	---	---	nC

Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250uA	-30	---	---	V
VGS(th)	Gate threshold voltage	VDS=VGS,ID=-250uA	-1.0	-1.5	-2.5	V
RDS(on)	Drain-Source On-state Resistance	VGS=-10V , ID=-4.5A	---	36	55	mΩ
		VGS=-4.5V , ID=-5A	---	50	75	mΩ
IGSS	Gate-source leakage current	VGS=±12V , VDS=0V	---	---	±100	A
IDSS	Zero gate voltage drain current	VDS=-20V,VGS=0V,TJ=25℃	---	---	-1	μA
			TJ=55℃	---	---	
Dynamic Characteristic						
Ciss	Input Capacitance	VGS=0V, VDS=-10V, Frequency=1.0MHz	---	530	---	pF
Coss	Output Capacitance		---	70	---	
Crss	Reverse Transfer Capacitance		---	56	---	
QG	Gate Total Charge	VDS=-10V, VGS=-5V, IDS=-3A	---	6.8	---	nC
Qgs	Gate-Source charge		---	1.0	---	
Qgd	Gate-Drain charge		---	1.4	---	
td(on)	Turn-on delay time	VDD=-10V , VGS=-5V , RG=5Ω, ID=-3A	---	14	---	ns
tr	Turn-on Rise Time		---	61	---	
td(off)	Turn-off Delay Time		---	19	---	
tf	Turn-off Fall Time		---	10	---	
RG	Gate Resistance	VGS=0V,VDS=0V,F=1MHz	---	---	---	Ω
Diode Characteristics						
VSD	Diode Forward Voltage	VGS=0V , IS=-1A , TJ=25℃	---	---	1.2	V
trr	Reverse Recovery Time	ISD=-4.1A, dISD/dt=-100A/μs	---	---	---	ns
Qrr	Reverse Recovery Charge		---	---	---	nC

N-Channel Typical Characteristics

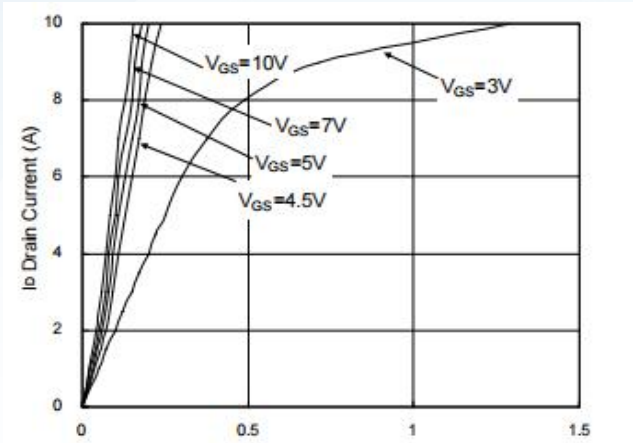


Figure1: Output Characteristics

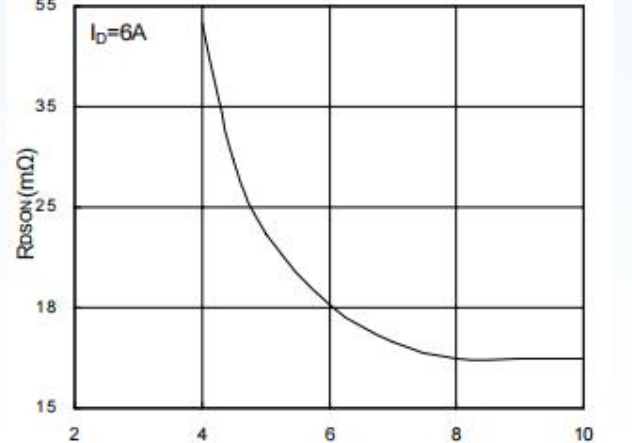


Figure 2: On-resistance vs. G-S Voltage

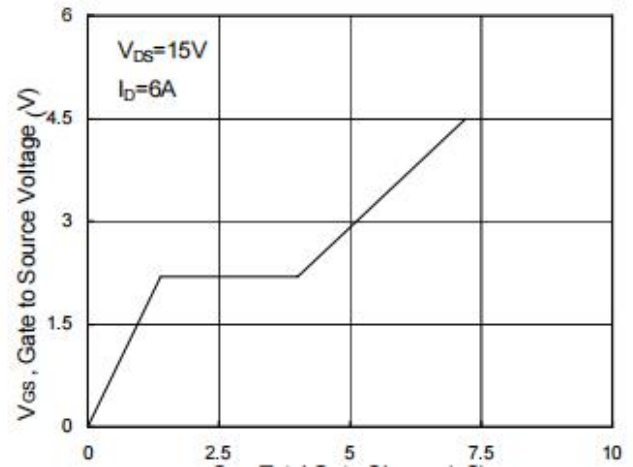


Figure 3: Gate Charge Characteristics

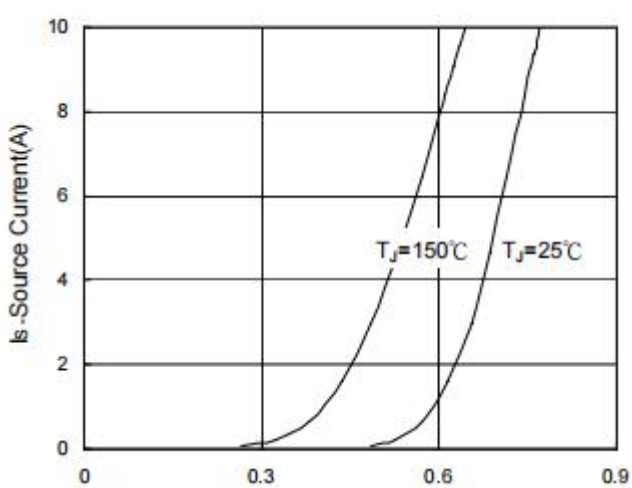


Figure 4: Capacitance Characteristics

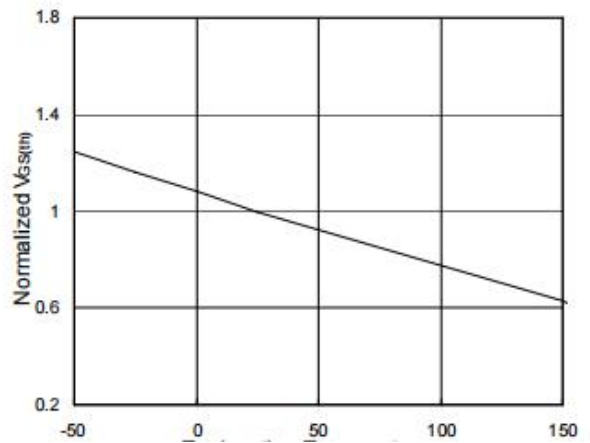


Figure 5: Normalized Breakdown Voltage vs. Junction Temperature

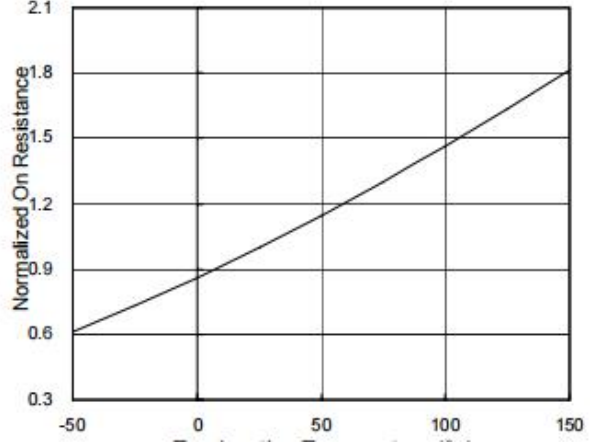


Figure 6: Normalized on Resistance vs. Junction Temperature

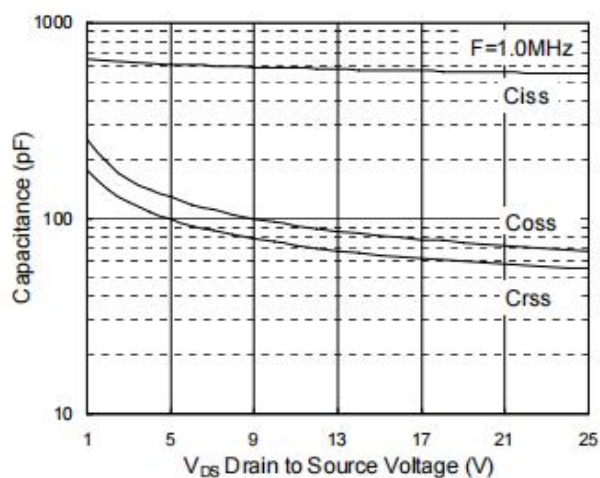


Fig.7 Capacitance

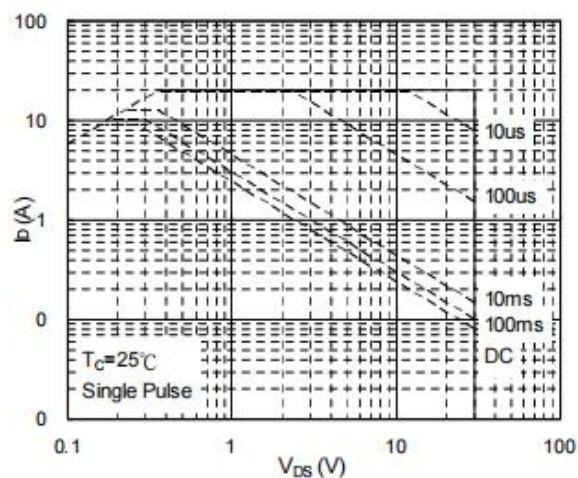


Figure 8: Maximum Safe Operating Area

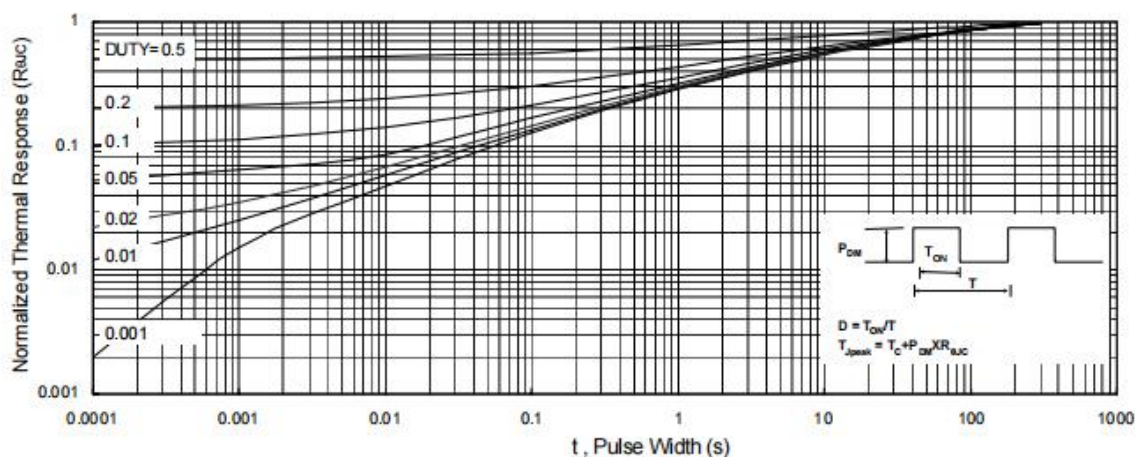


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

P-Channel Typical Characteristics

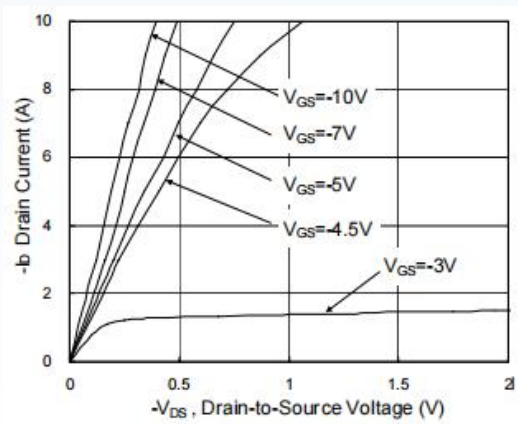


Fig.1 Typical Output Characteristics

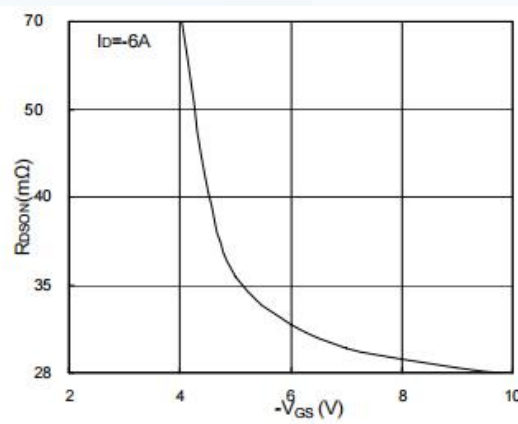


Fig.2 On-Resistance vs. Gate-Source

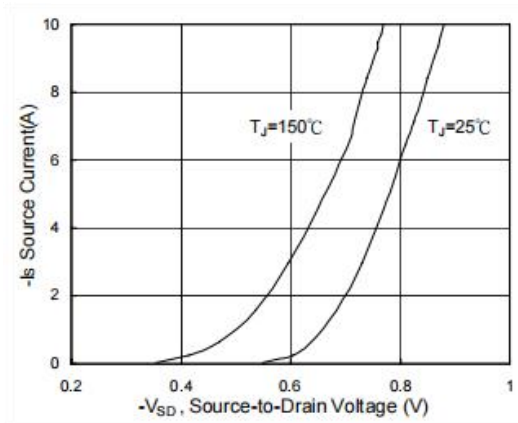


Fig.3 Forward Characteristics of Reverse

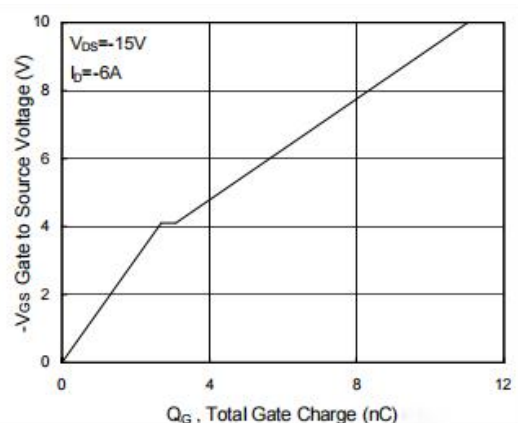


Fig.4 Gate-charge Characteristics

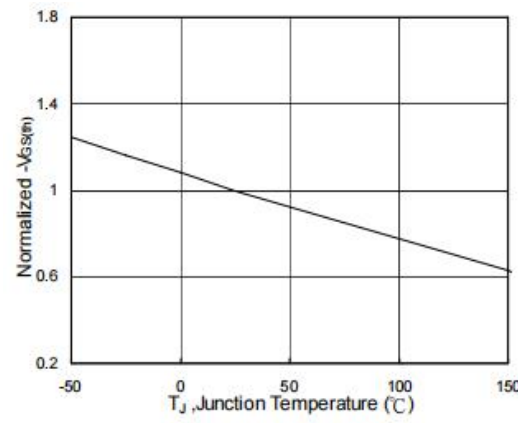


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

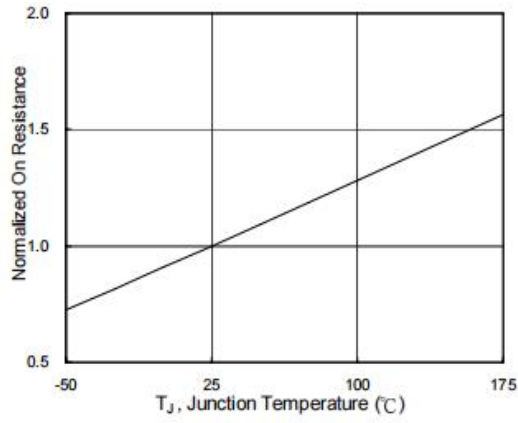


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

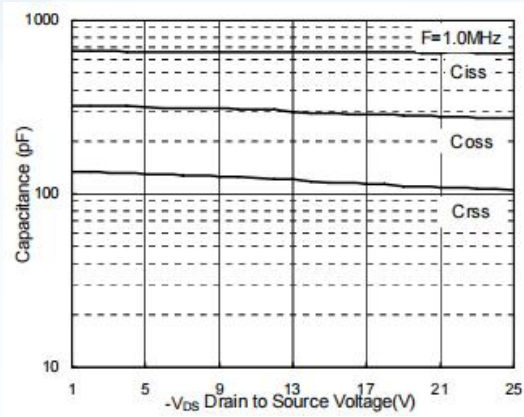


Fig.7 Capacitance

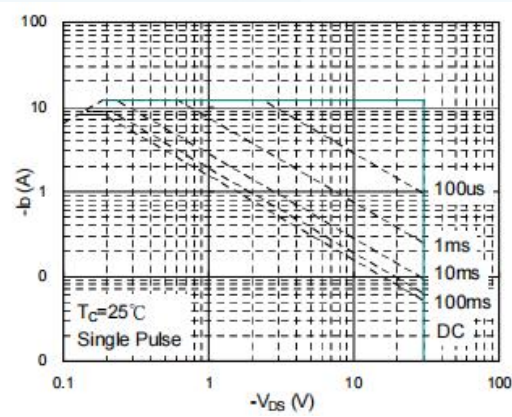


Fig.8 Safe Operating Area

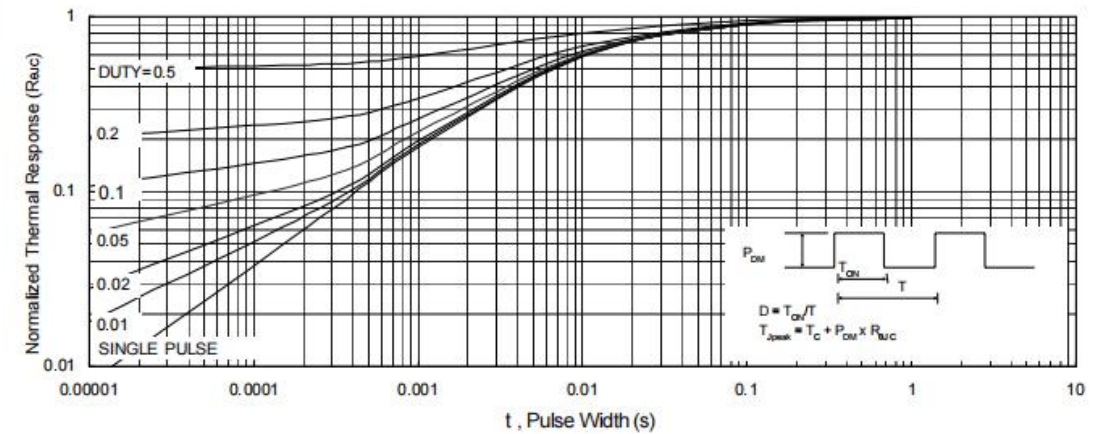
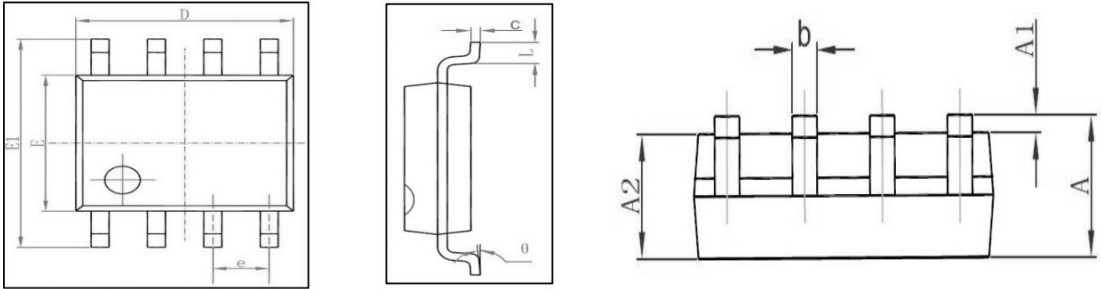


Fig.9 Normalized Maximum Transient Thermal Imp



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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