

MOSFET

18A,60V,7.2mΩ,N-CHANNEL MOSFET

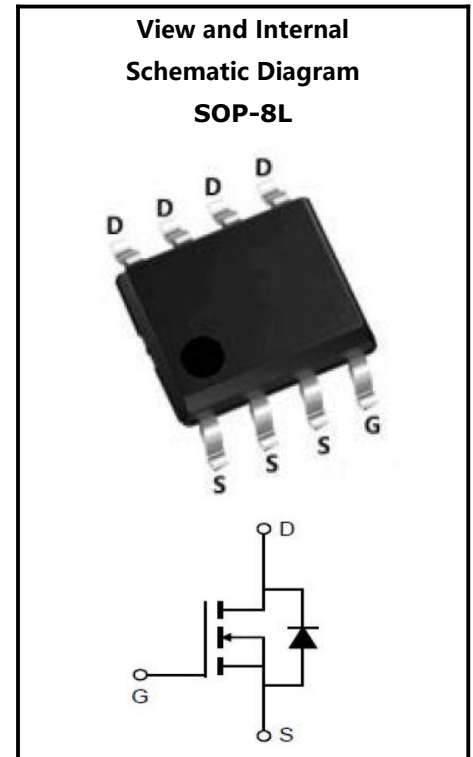
Features

- ◆ Extremely low on-resistance $R_{DS(on)}$
- ◆ Excellent Low Ciss

Applications

- ◆ Synchronous Rectification for AC/DC Quick Charger
- ◆ Battery management
- ◆ UPS(Uninterruptible Power Supplies)

Parameter	Values	Unit
BV_{DSS}	60	V
I_D	18	A
$R_{DS(on)}(max)$	7.2	mΩ
$V_{GS(th)}(Typ)$	1.7	V



Ordering Code	Marking	Package	Packaging
X7P2N060GLI8	X7P2N060GLI8	SOP-8L	Tape& Reel

Absolute Maximum Ratings($T_C=25^{\circ}C$,unless otherwise noted)

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Drain-Source Voltage	V_{DSS}	-	-	60	V	-
Gate-Source Voltage	V_{GS}	-20	-	20	V	-
Continuous Drain Current(Note 1)	I_D	-	-	18	A	$T_C=25^{\circ}C$
		-	-	12	A	$T_C=100^{\circ}C$
Pulsed Drain Current(Note 2)	I_{DM}	-	-	74	A	-
Single Pulse Avalanche Energy	E_{AS}	-	-	45	mJ	$L=0.5mH, V_{DS}=48V$
Maximum Power Dissipation	P_D	-	-	4	W	$T_C=25^{\circ}C$
		-	-	0.9	W	$T_A=25^{\circ}C$
Operating Junction and Storage Temperature Range	T_{j}, T_{STG}	-55	-	150	$^{\circ}C$	-

Thermal Characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Thermal resistance , junction to Lead	$R_{th(J-L)}$	-	-	29	$^{\circ}C/W$	-
Thermal resistance , junction to Ambient	$R_{th(J-a)}$	-	-	135		-

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Static characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Drain-Source Breakdown Voltage	BV _{DSS}	60	-	-	V	V _{GS} =0V, I _D =250μA
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1	μA	V _{DS} =60V, V _{GS} =0V
Gate-Body Leakage Current, Forward	I _{GSSF}	-	-	100	nA	V _{GS} =20V, V _{DS} =0V
Gate-Body Leakage Current, Reverse	I _{GSSR}	-	-	-100	nA	V _{GS} =-20V, V _{DS} =0V
Gate-Source Threshold Voltage	V _{GS(th)}	1	-	2.5	V	V _{DS} =V _{GS} , I _D =250μA
Drain-Source On-State Resistance	R _{DS(on)}	-	6.2	7.2	mΩ	V _{GS} =10V, I _D =18A
		-	8.2	10.7	mΩ	V _{GS} =4.5V, I _D =9A
Gate Resistance	R _g	-	1.5	-	Ω	V _{GS} =0V, V _{DS} =0V, f=1MHz
Forward Transconductance	g _{fs}	-	30	-	S	V _{DS} =5V, I _D =18A

Dynamic characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Input Capacitance	C _{iss}	-	1653	-	pF	V _{DS} =30V, V _{GS} =0V, f=1MHz
Output Capacitance	C _{oss}	-	294	-	pF	
Reverse Transfer Capacitance	C _{rss}	-	37	-	pF	
Turn-On Delay Time	t _{d(on)}	-	8	-	ns	V _{DD} =30V, R _G =1.6Ω, V _{GS} =10V, I _D =20A
Turn-On Rise Time	t _r	-	20	-	ns	
Turn-Off Delay Time	t _{d(off)}	-	24	-	ns	
Turn-Off Fall Time	t _f	-	11	-	ns	

Gate charge characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Total Gate Charge	Q _g	-	27	-	nC	V _{DS} =30V, I _D =20A, V _{GS} =10V
Gate-Source Charge	Q _{gs}	-	6	-	nC	
Gate-Drain Charge	Q _{gd}	-	4	-	nC	

Reverse diode

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Continuous Diode Forward Current	I _S	-	-	18	A	-
Pulsed Diode Forward Current	I _{SM}	-	-	74	A	-
Diode Forward Voltage	V _{SD}	-	-	1.2	V	I _S =18A, V _{GS} =0V
Reverse Recovery Time	t _{rr}	-	37	-	ns	V _{GS} =0V, V _{DS} =30V, I _S =20V,
Reverse Recovery Charge	Q _{rr}	-	18	-	nC	di/dt=100A/μs

Notes

1. Computed continuous current assumes the condition of T_{J,Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J,Max} = 150°C.

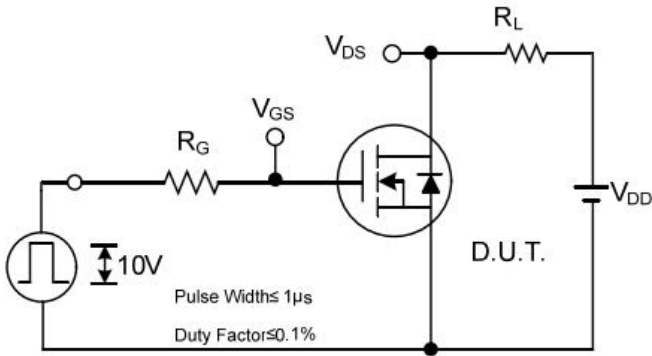
RATING AND CHARACTERISTIC CURVES



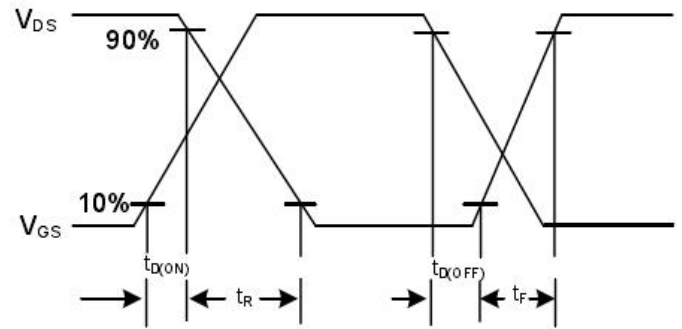
Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms



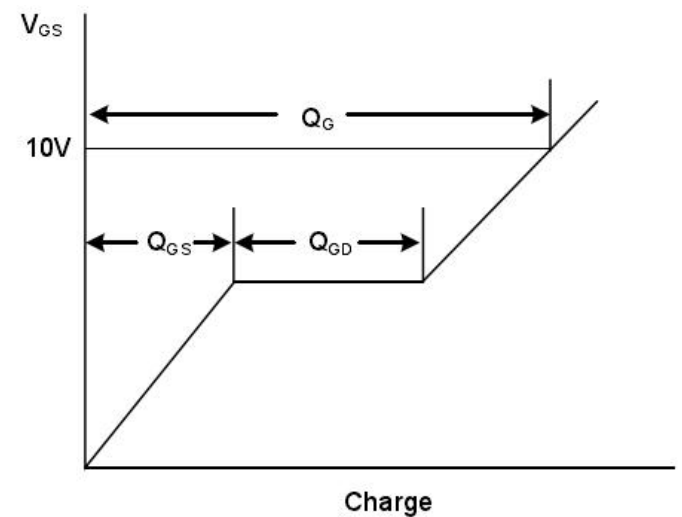
Switching Test Circuit



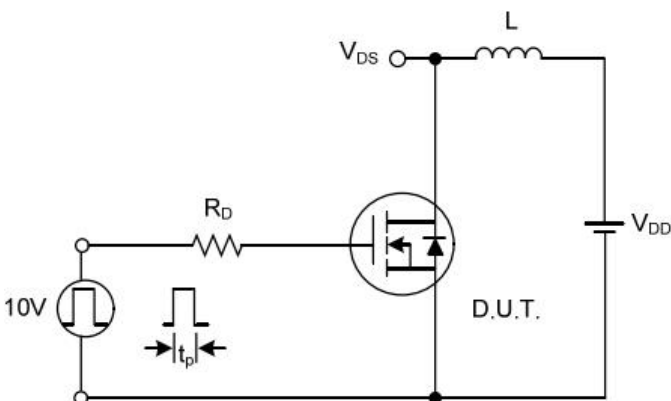
Switching Waveforms



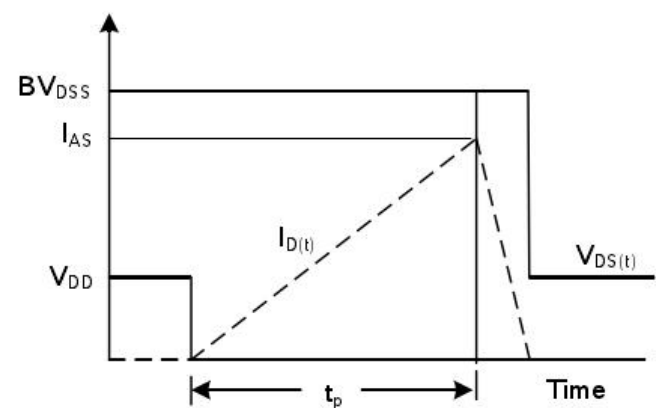
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

RATING AND CHARACTERISTIC CURVES

Figure.1 Output Characteristics

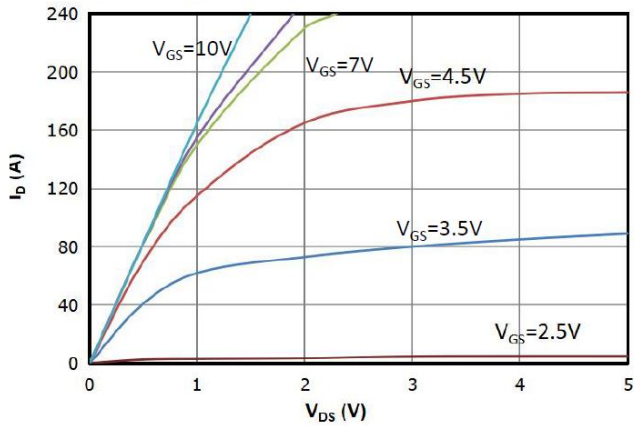


Figure.2 Transfer Characteristics

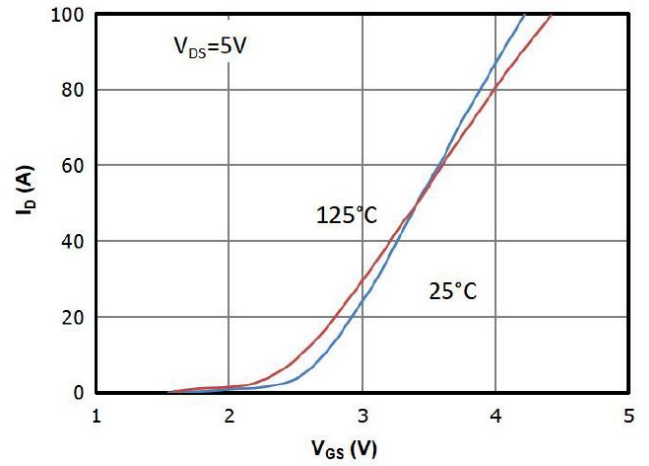


Figure.3 Rds(on) vs Drain Current and Gate Voltage

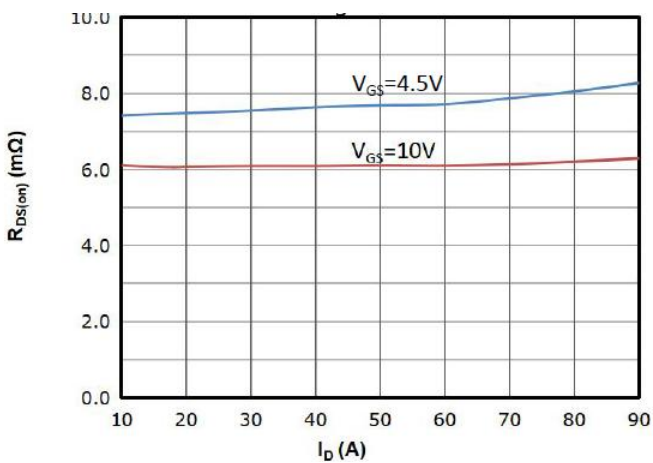


Figure.4 Rds(on) vs Gate Voltage

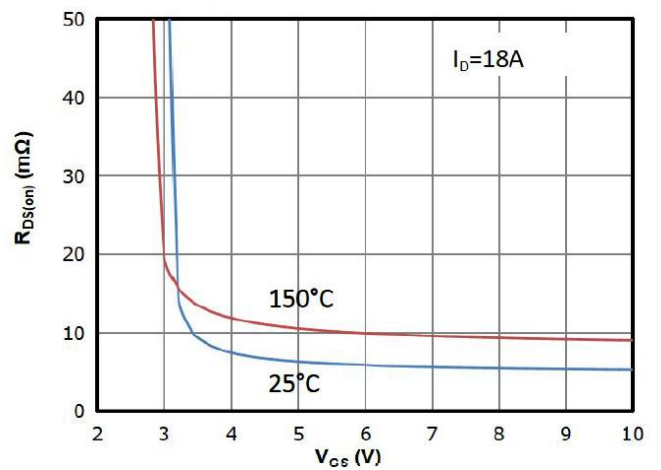


Figure.5 Rds(on) vs. Temperature

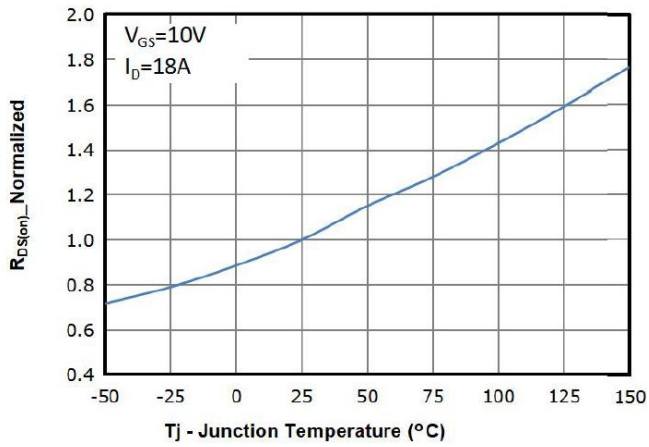


Figure.6 Vgs(th) vs. Temperature

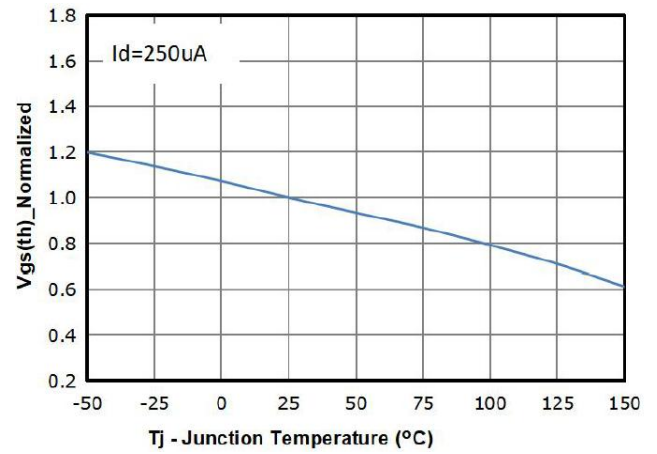


Figure.7 BVdss vs. Temperature

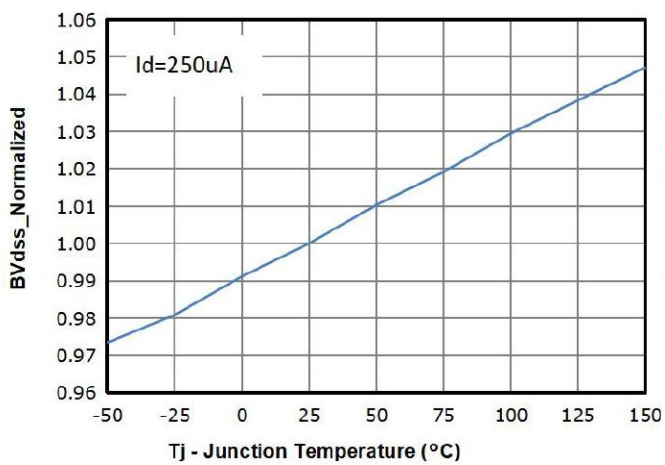


Figure.8 Capacitance Characteristics

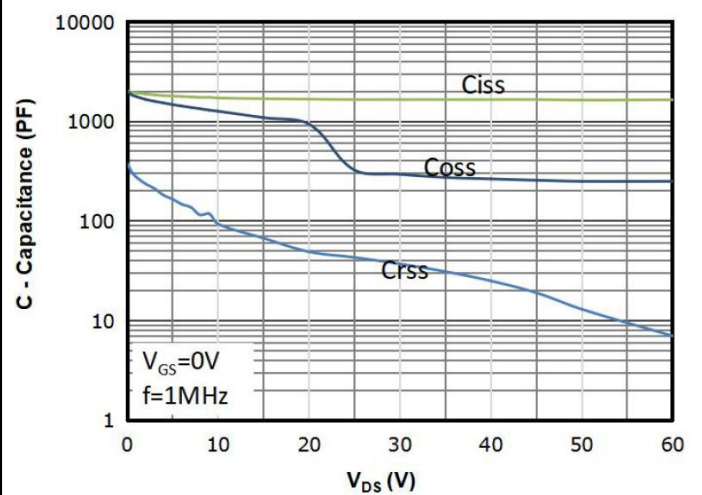


Figure.9 Gate Charge Characteristics

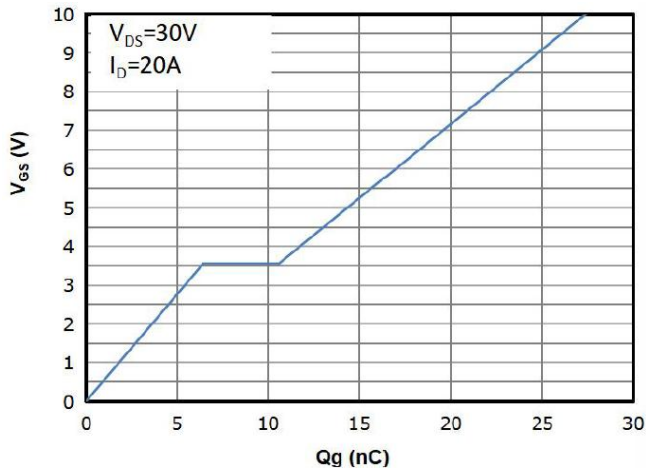


Figure.10 Body-diode Forward Characteristics

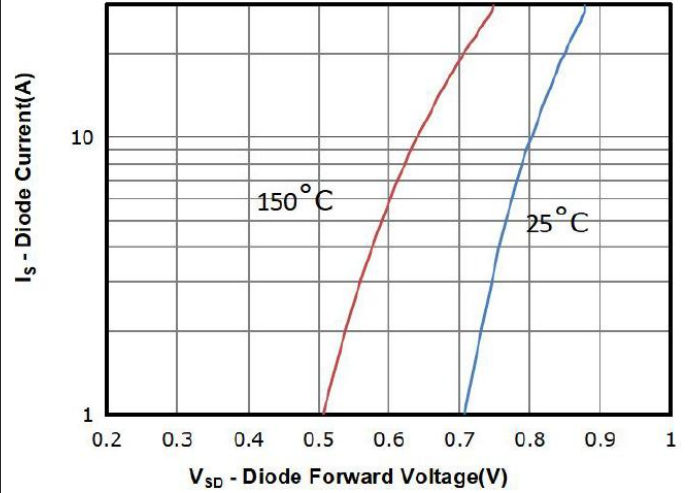


Figure.11 Power Dissipation

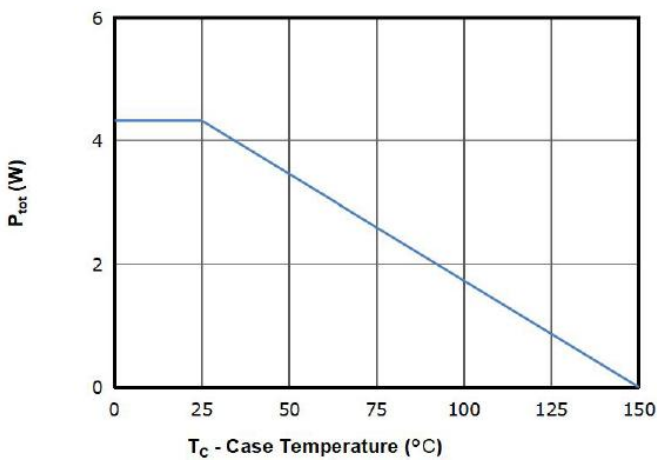


Figure.12 Drain Current Derating

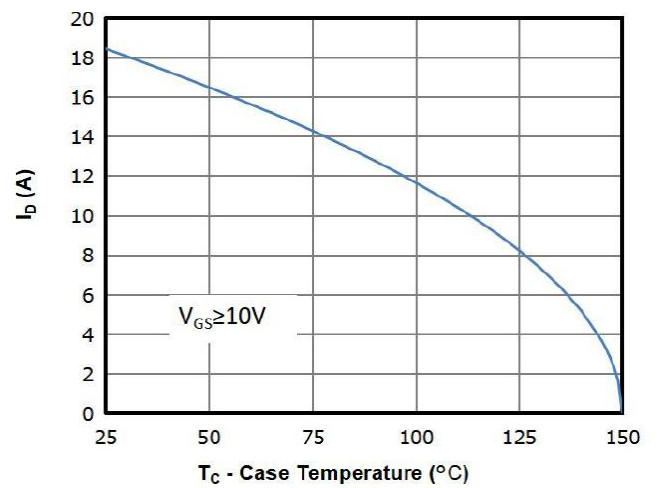


Figure.13 Safe Operating Area

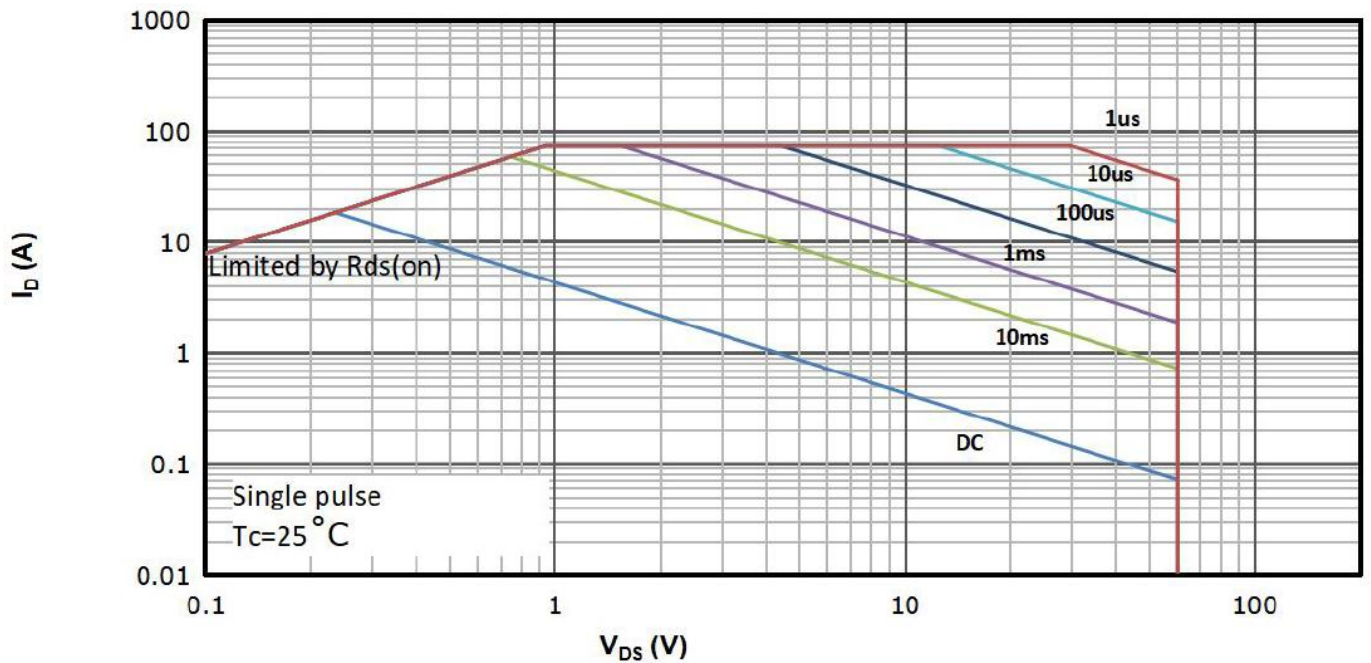
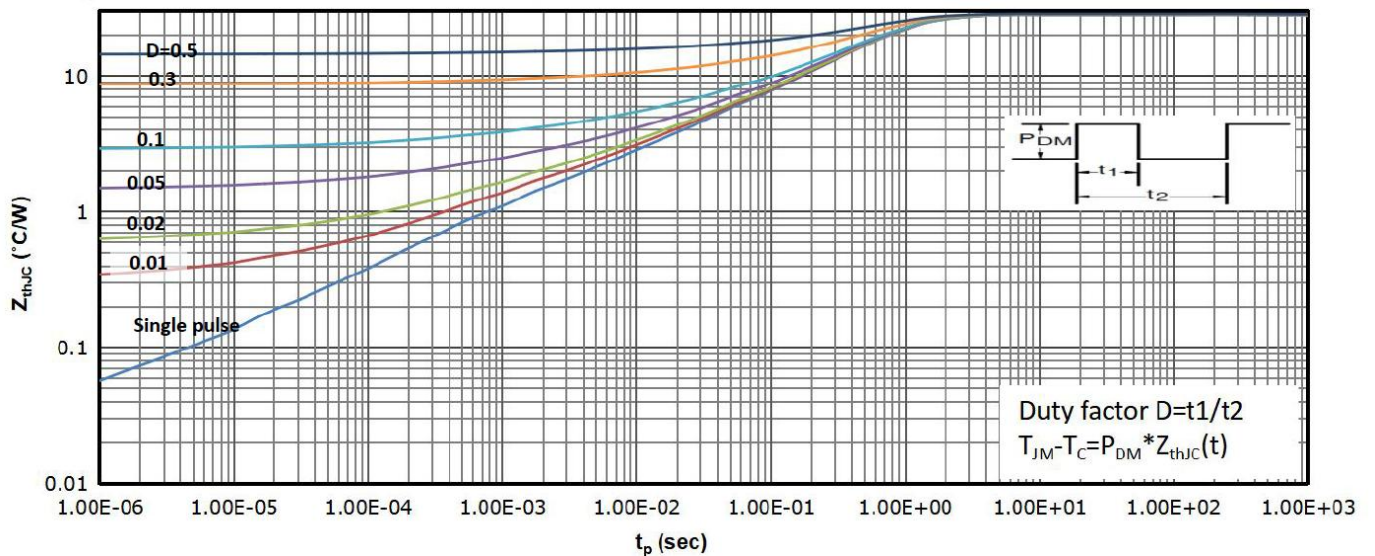
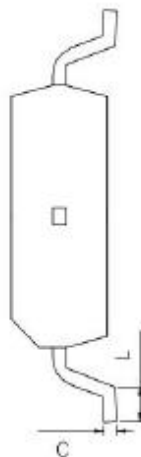
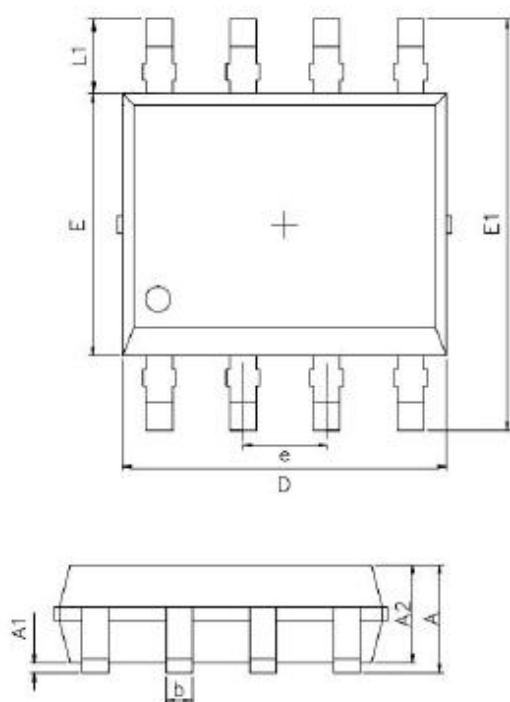


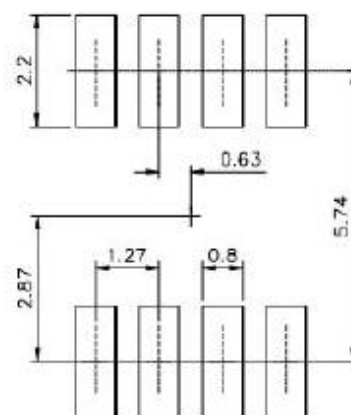
Figure.14 Maximum Effective Thermal Impedance, Junction to Case



Package Outline: SOP-8L



RECOMMENDED LAND PATTERN



UNIT:mm

SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.65	0.049	0.065
b	0.30	0.50	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.10	0.189	0.201
E	3.72	4.02	0.146	0.158
E1	5.95	6.25	0.234	0.246
e	1.27		0.050	
L	0.40	0.90	0.016	0.035
L1	0.92	1.22	0.036	0.048