

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	10mΩ@10V	7A
	24mΩ@4.5V	
-30V	19mΩ@-10V	-8A
	25mΩ@-4.5V	

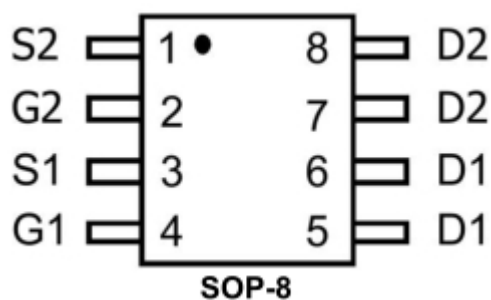
Feature

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge
- Fast Switching Speed

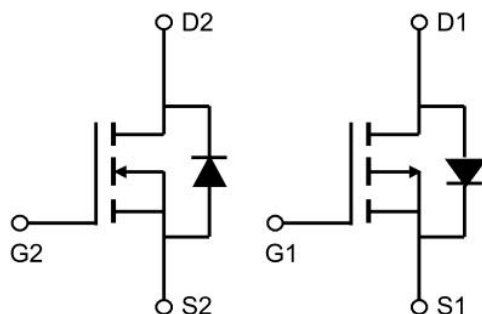
Applications

- Motor Control
- DC-DC Converters
- Power Management

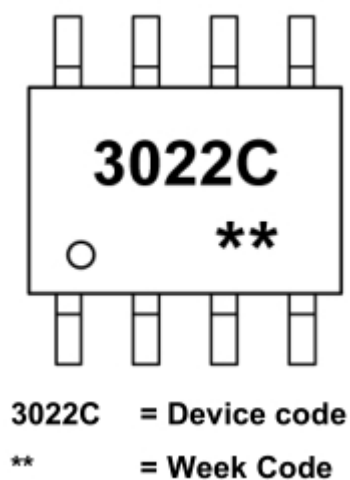
Package



Circuit diagram



Marking



Absolute maximum ratings

($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current($t \leq 10\text{s}$)	I_D	7	-8	A
Power Dissipation($t \leq 10\text{s}$)	P_D	1.8	1.8	W
Thermal Resistance from Junction to Ambient($t \leq 10\text{s}$)	$R_{\theta JA}$	69.5		$^{\circ}\text{C/W}$
Junction Temperature	T_J	150		$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}\text{C}$

N-Channel Electrical characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =24V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±0.1	μA
Gate threshold voltage ⁽¹⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.6	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =1A		18	28	mΩ
		V _{GS} =4.5V, I _D =1A		25	35	
Dynamic Characteristics						
Input capacitance	C _{iSS}	V _{DS} =15V, V _{GS} =0V, f=1MHz		416		pF
Output capacitance	C _{oSS}			62		
Reverse transfer capacitance	C _{rSS}			51		
Switching Characteristics						
Total gate charge	Q _g	V _{DS} =20V, V _{GS} =4.5V, I _D =6A		5		nC
Gate-source charge	Q _{gs}			1.11		
Gate-drain charge	Q _{gd}			2.61		
Turn-on Delay Time	T _{d(on)}	V _{DS} =12V, V _{GS} =10V , R _G =3.3, I _D =6A		7.7		nS
Turn-on Rise Time	T _r			46		
Turn-Off Delay Time	T _{d(off)}			11		
Turn-Off Fall Time	t _f			3.6		
Source-Drain Diode Characteristics						
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} = 0V			1.2	V

P-Channel Electrical characteristics

($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$BV_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -24V, V_{GS} = 0V$			-1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	μA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -8A$		19	28	m Ω
		$V_{GS} = -4.5V, I_D = -6A$		25	35	
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1MHz$		1345		pF
Output capacitance	C_{oss}			194		
Reverse transfer capacitance	C_{rss}			158		
Switching Characteristics						
Turn-on Delay Time	$T_{d(on)}$	$V_{DS} = -15V, I_D = -6A,$ $V_{GS} = -10V, R_{GEN} = 3.3\Omega$		4.6		nS
Turn-on Rise Time	T_r			14.8		
Turn-Off Delay Time	$T_{d(off)}$			41		
Turn-Off Fall Time	t_f			19.6		
Total gate charge	Q_g	$V_{DS} = -15V, V_{GS} = -4.5V,$ $I_D = -6A$		12.6		nC
Gate-source charge	Q_{gs}			4.8		
Gate-drain charge	Q_{gd}			4.8		
Source-Drain Diode Characteristics						
Body Diode Voltage	V_{SD}	$I_S = -1A, V_{GS} = 0V$			-1.2	V

N-Channel Typical Characteristics

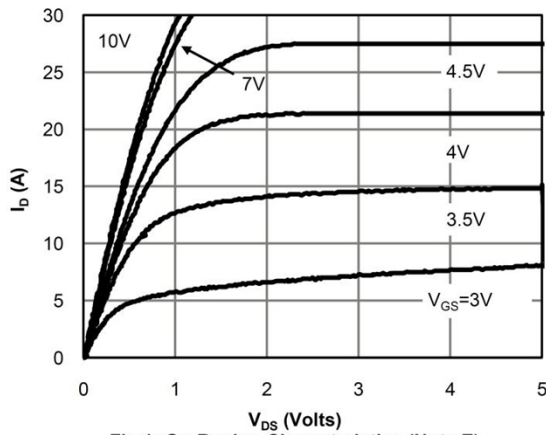


Fig 1: On-Region Characteristics (Note E)

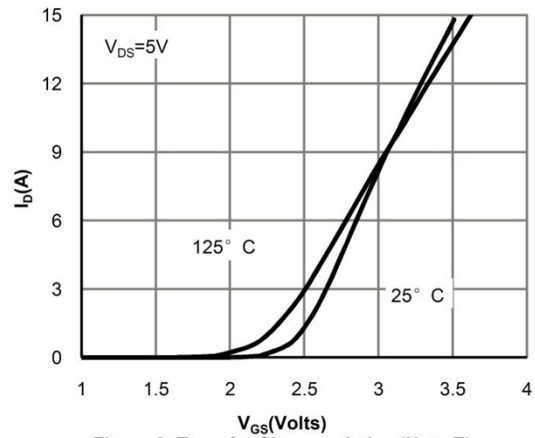


Figure 2: Transfer Characteristics (Note E)

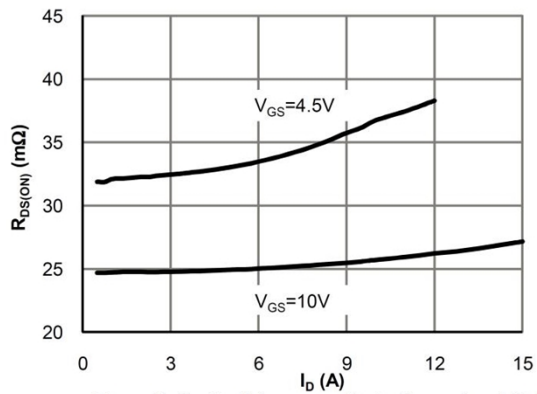


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

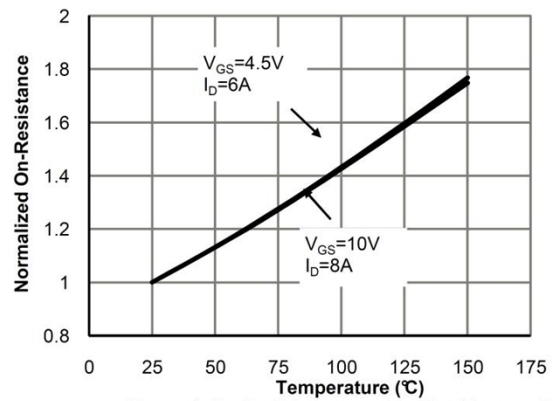


Figure 4: On-Resistance vs. Junction Temperature (Note E)

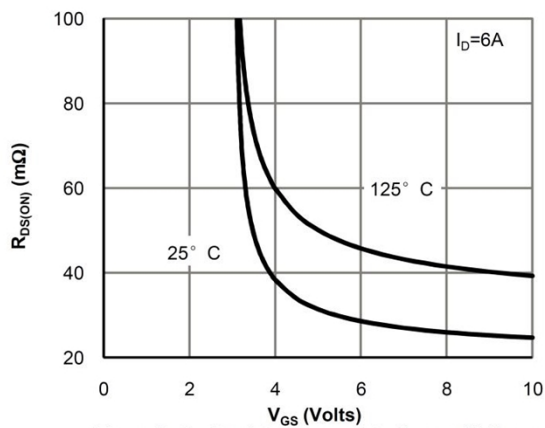


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

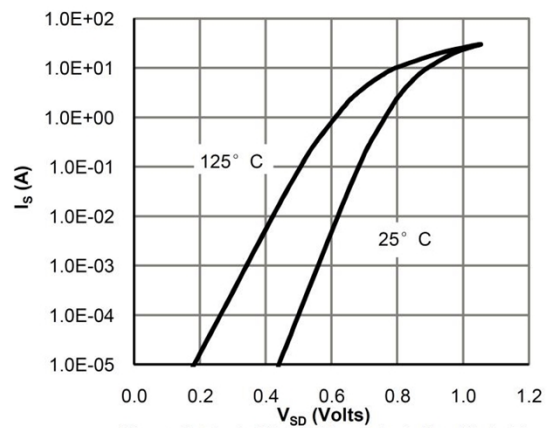


Figure 6: Body-Diode Characteristics (Note E)

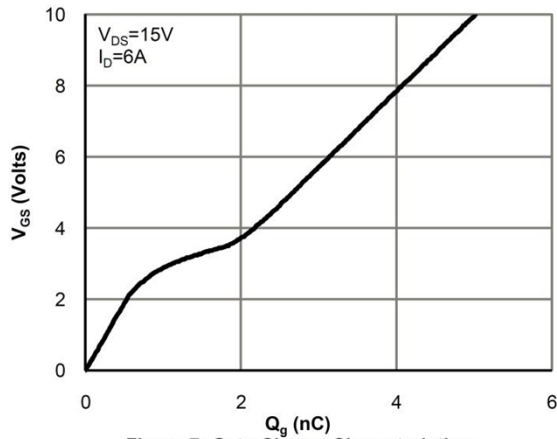


Figure 7: Gate-Charge Characteristics

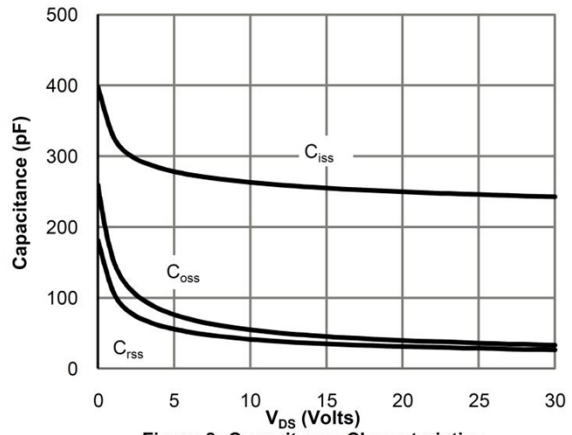


Figure 8: Capacitance Characteristics

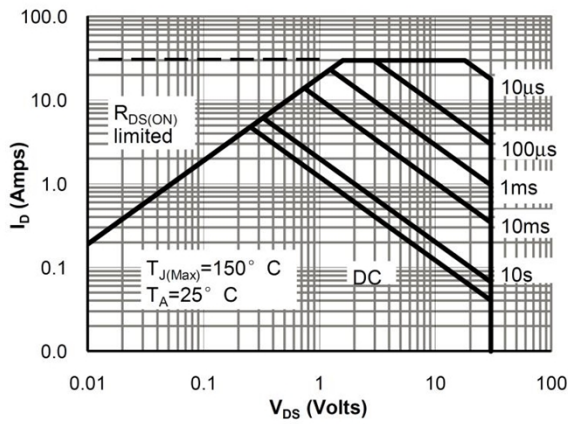


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

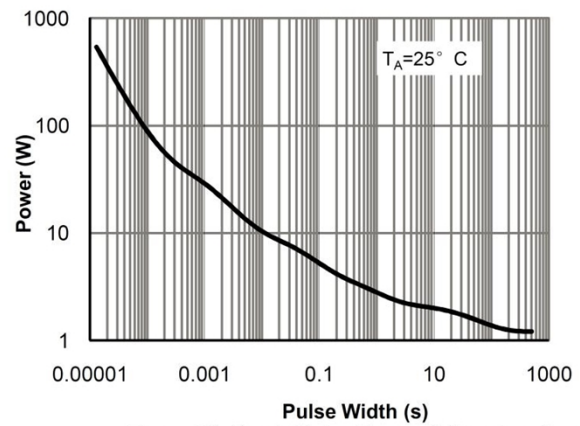


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

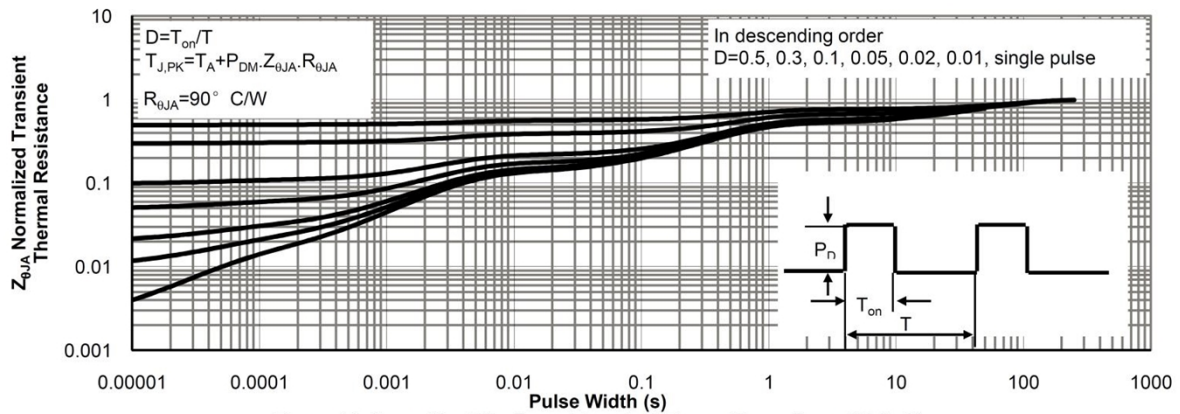
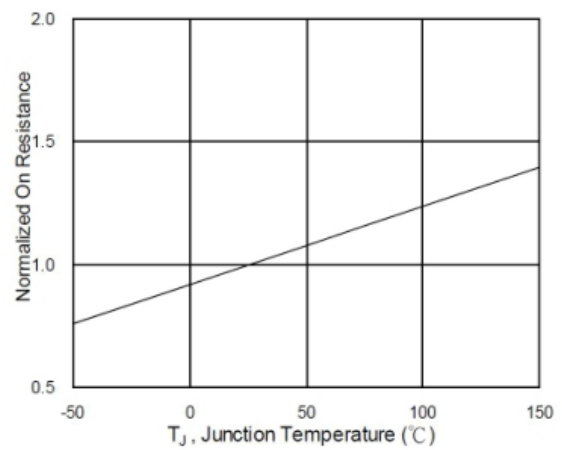
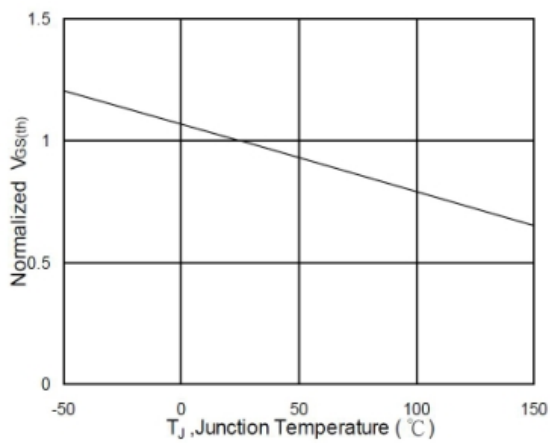
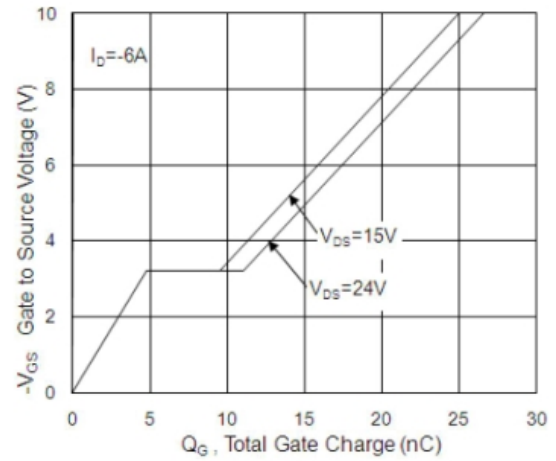
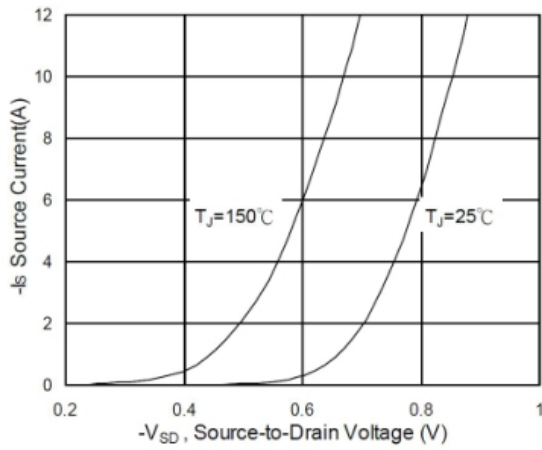
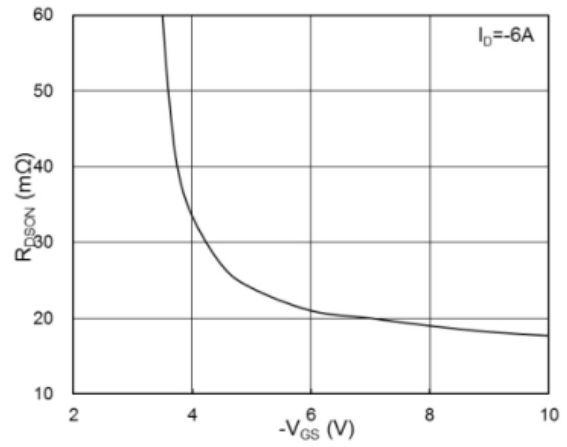
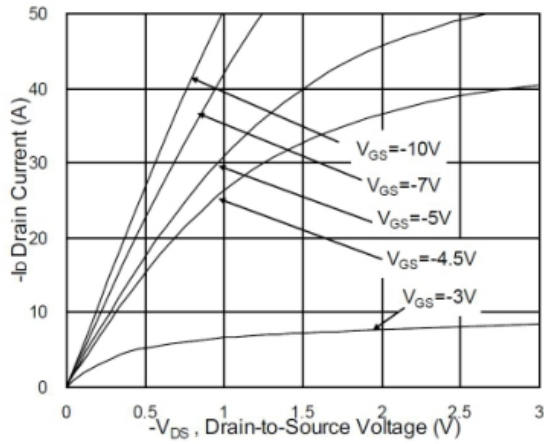


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

P-Channel Typical Characteristics



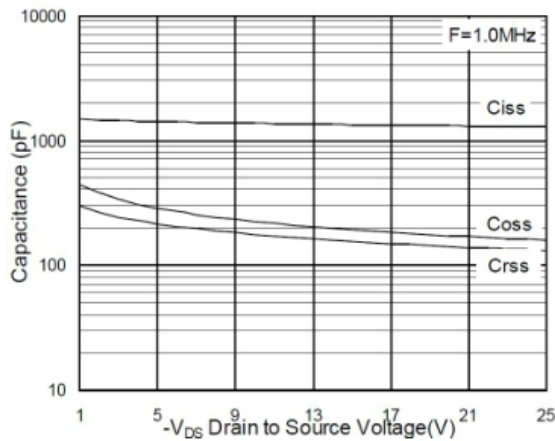


Fig.7 Capacitance

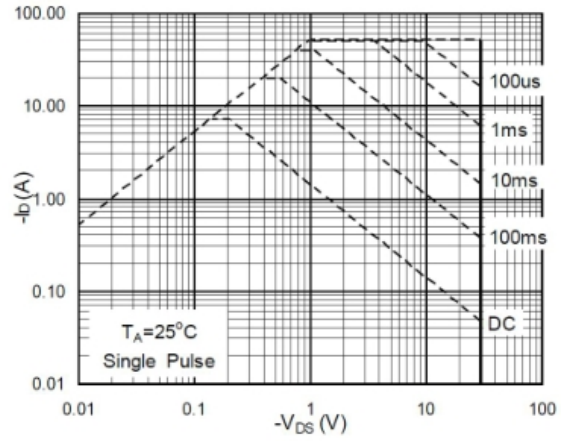


Fig.8 Safe Operating Area

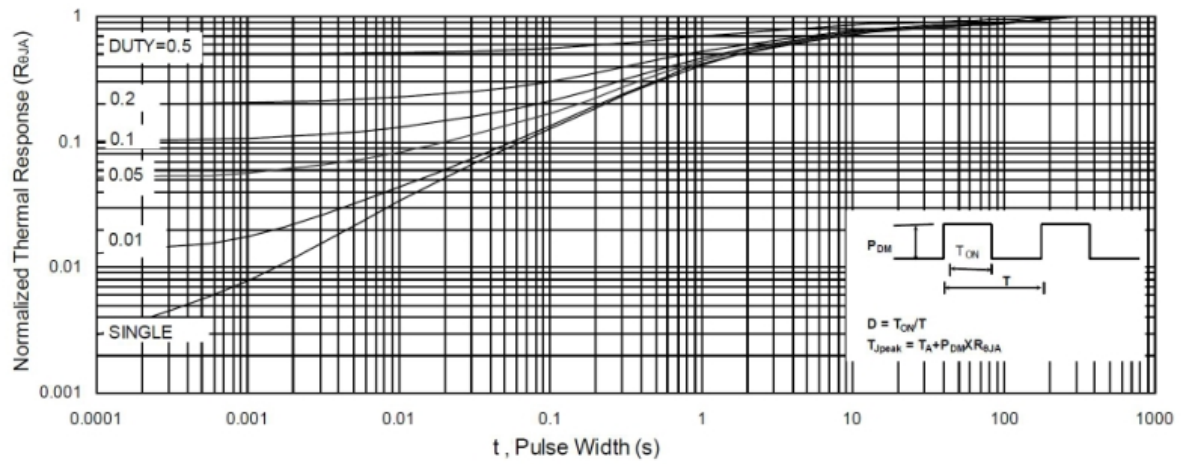


Fig.9 Normalized Maximum Transient Thermal Impedance

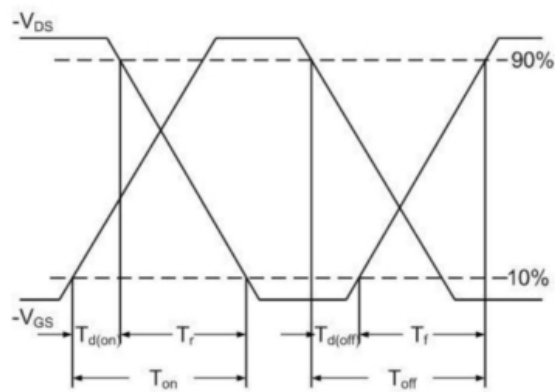


Fig.10 Switching Time Waveform

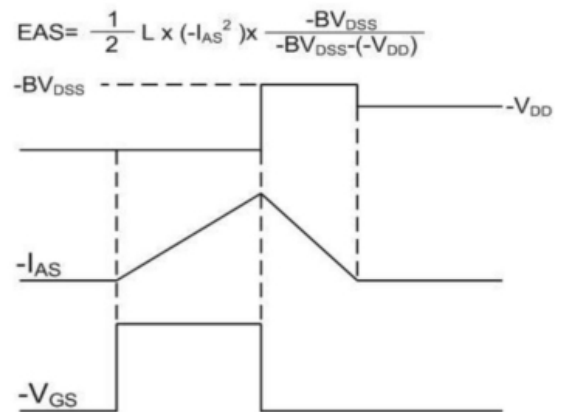
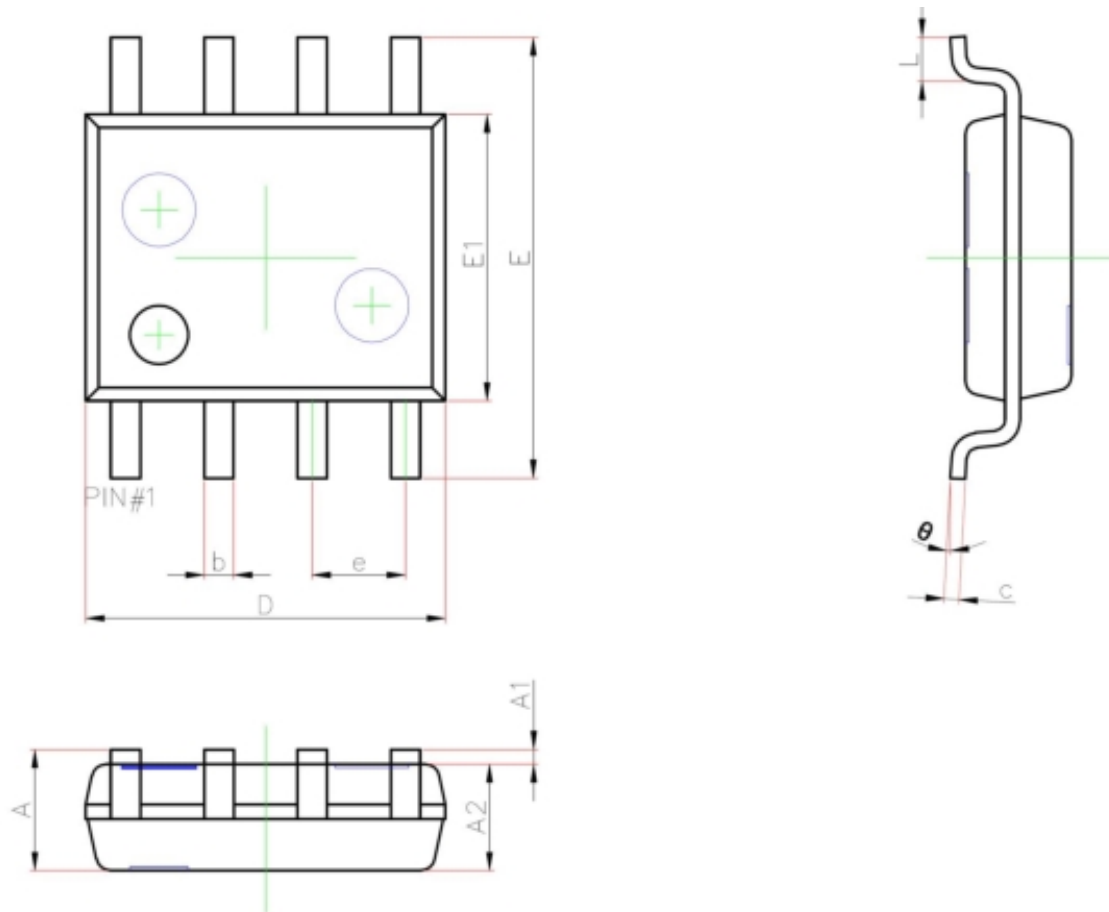


Fig.11 Unclamped Inductive Switching Waveform

SOP-8 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.80	5.00
e	1.27 REF.	
E	5.80	6.20
E1	3.80	4.00
L	0.40	1.27
θ	0°	8°