N-Ch and P-Ch Fast Switching MOSFETs

General Description

The LPM9030 is the high performance complementary N-ch and P-ch MOSFETs with high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The LPM9030 meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

Features

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

Applications

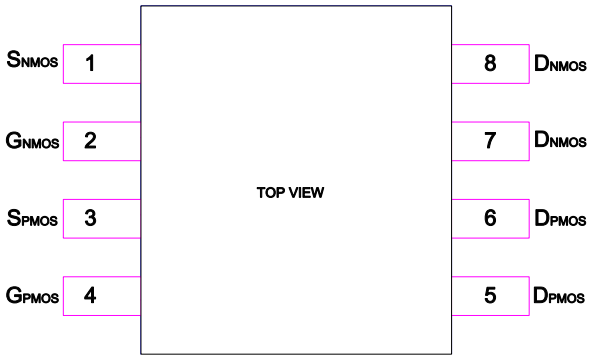
- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Order Information

LPM9030 □ □ □

- F: Pb-Free
- Package Type
  - SP: SOP8

Pin Configurations



Pin Description

Pin Number	Pin Description
1	Source Of NMOS
2	Gate Of NMOS
3	Source Of PMOS
4	Gate Of PMOS
5,6	Drain Of PMOS
7,8	Drain Of NMOS

Absolute Maximum Ratings

©Parameter		Symbol	NMOS	PMOS	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	
Continuous Drain Current	TA=25°C		10	-7.6	A
Maximum Power Dissipation	TA=25°C		2.0	2.0	W
Pulsed Drain Current		I_{DM}	20	-15	A
Single Pulse Avalanche Energy		EAS	22	45	mJ
Avalanche Current		I_{AS}	21	-30	A
Operating Junction Temperature		T_J	-55 to 150	-55 to 150	°C
Lead Temperature		T_L	260	260	°C
Storage Temperature Range		T_{stg}	-55 to 150	-55 to 150	°C

Thermal resistance ratings

Parameter	Symbol	Typ.	Unit
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	62	℃/W

Electrical Characteristics

N-Channel MOSFET Electrical Characteristics (TJ=25℃, unless otherwise noted) :

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.023	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	---	18	mΩ
		V_{GS}=4.5V , I_D=5A	---	---	28	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.2	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=10A	---	16	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.5	5	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=20V , V_{GS}=4.5V , I_D=10A	---	7.2	---	nC
Q_{gs}	Gate-Source Charge		---	1.4	---	
Q_{gd}	Gate-Drain Charge		---	2.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3 , I_D=5A	---	4.1	---	ns
T_r	Rise Time		---	9.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	15.5	---	
T_f	Fall Time		---	6.0	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	572	---	pF
C_{oss}	Output Capacitance		---	81	---	
C_{rss}	Reverse Transfer Capacitance		---	65	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	10	A
I_{SM}	Pulsed Source Current		---	---	20	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

P-Channel MOSFET Electrical Characteristics (TJ=25℃, unless otherwise noted) :

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.021	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-7A	---	---	30	mΩ
		V_{GS}=-4.5V , I_D=-5A	---	---	55	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	---	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.2	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-7A	---	15	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	15	30	Ω
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-20V , V_{GS}=-4.5V , I_D=-7A	---	9.8	---	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	
Q_{gd}	Gate-Drain Charge		---	3.4	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V , V_{GS}=-10V , R_G=3.3 , I_D=-5A	---	16.4	---	ns
T_r	Rise Time		---	20.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	55	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	930	---	pF
C_{oss}	Output Capacitance		---	148	---	
C_{rss}	Reverse Transfer Capacitance		---	115	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-7.6	A
I_{SM}	Pulsed Source Current		---	---	-15	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

Typical Characteristics

N-Channel :

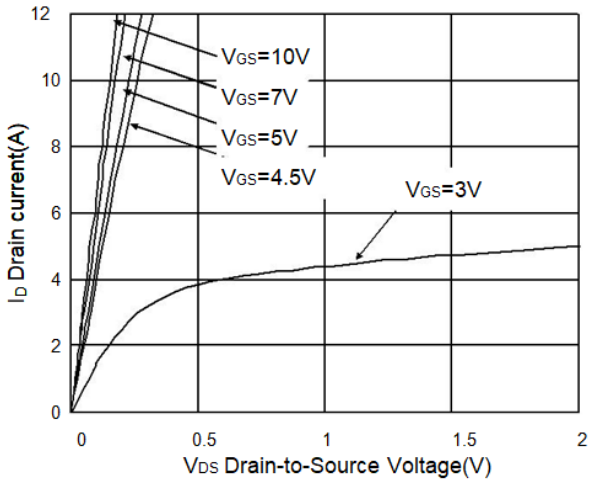


Fig.1 Typical Output Characteristics

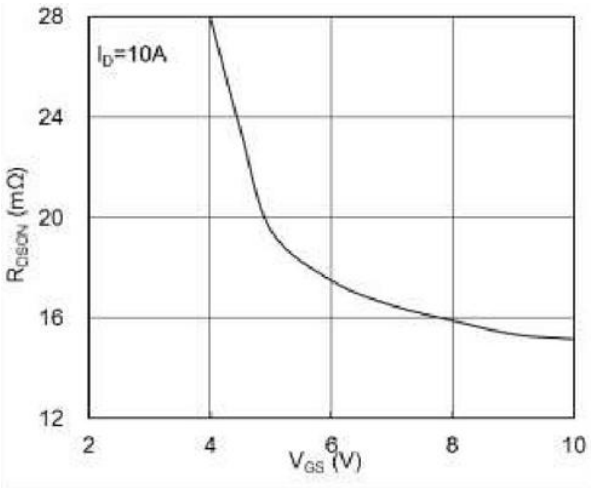


Fig.2 On-Resistance vs Gate-Source Voltage

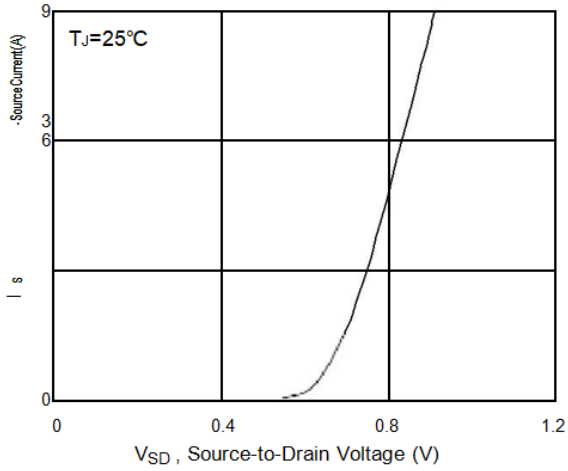


Fig.3 Forward Characteristics of Reverse

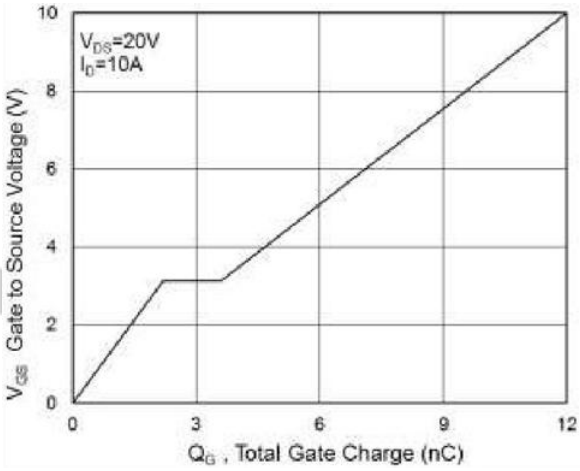


Fig.4 Gate-Charge Characteristics

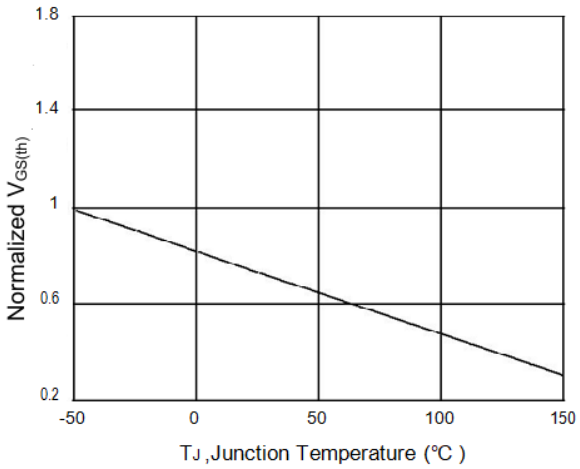


Fig.5 Normalized VGS(th) vs TJ

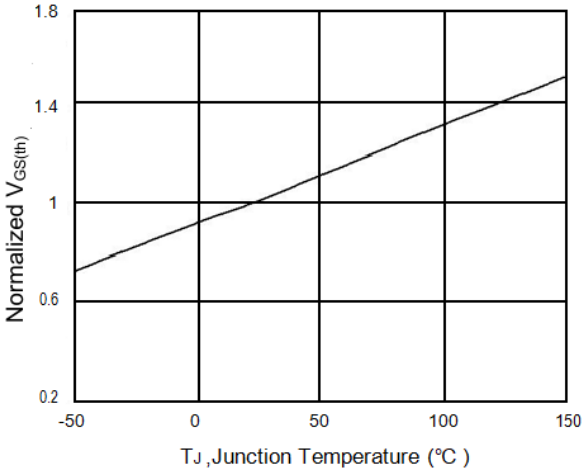


Fig.6 Normalized RDSON vs TJ

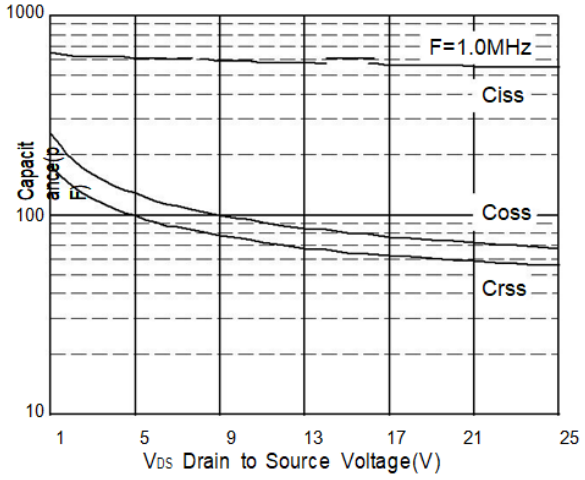


Fig.7 Capacitance

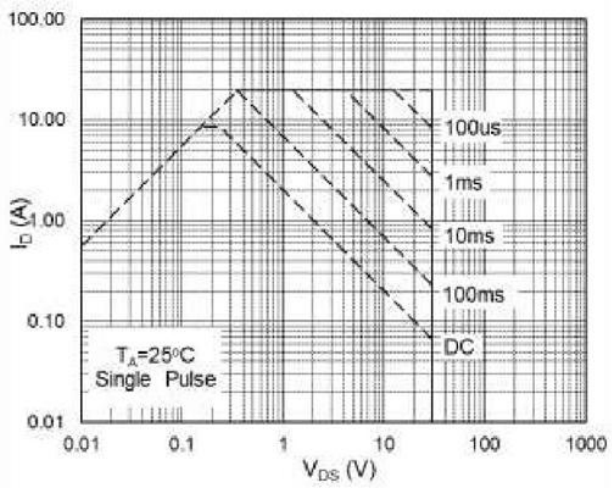


Fig.8 Safe Operating Area

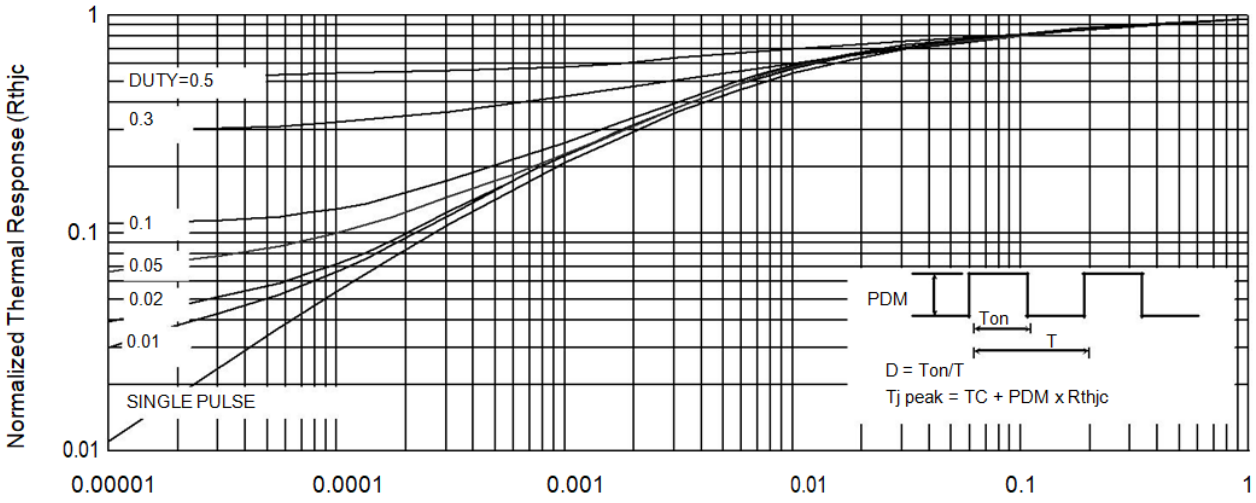


Fig.9 Normalized Maximum Transient Thermal Impedance

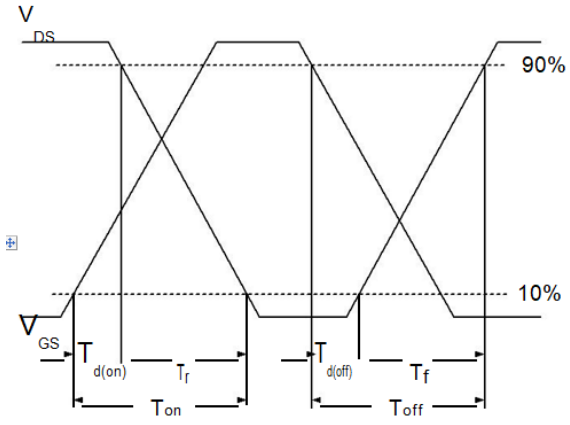


Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

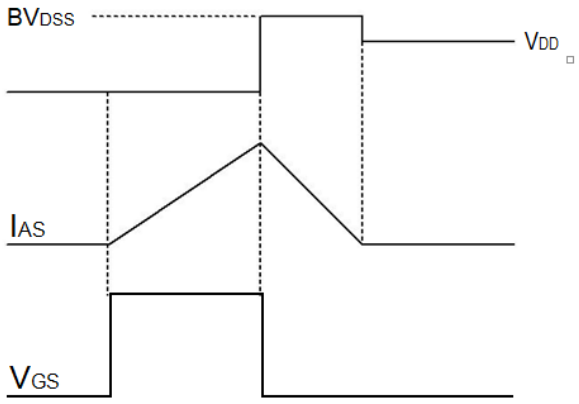


Fig.11 Unclamped Inductive Waveform

P-Channel:

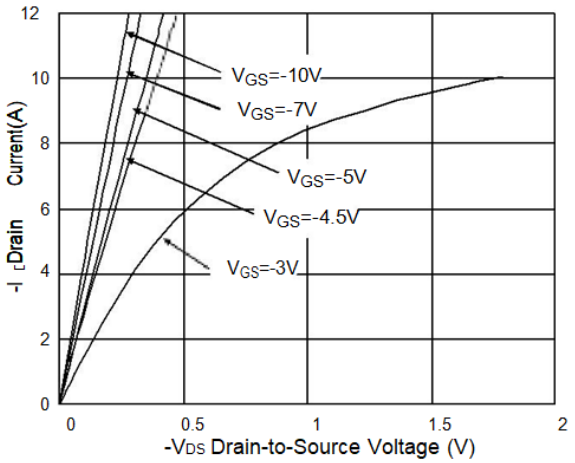


Fig.1 Typical Output Characteristics

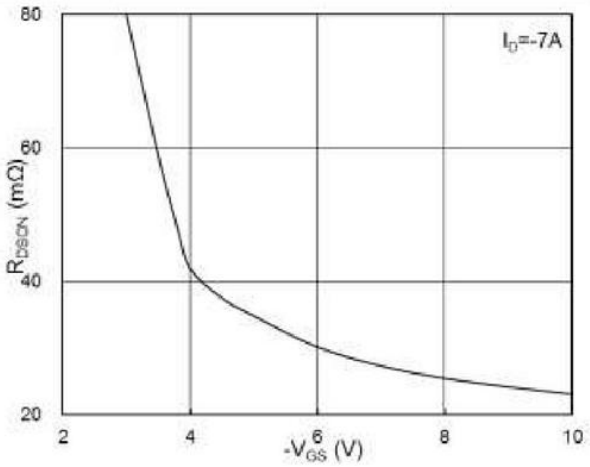


Fig.2 On-Resistance vs Gate-Source Voltage

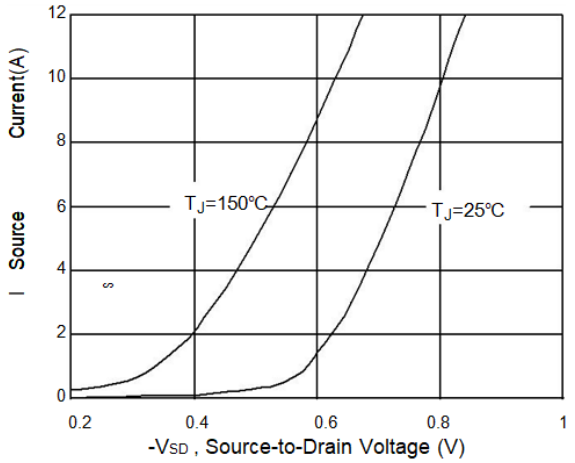


Fig.3 Forward Characteristics of Reverse

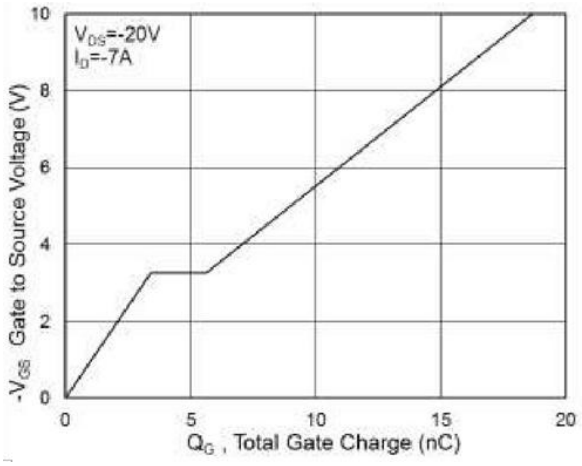


Fig.4 Gate-Charge Characteristics

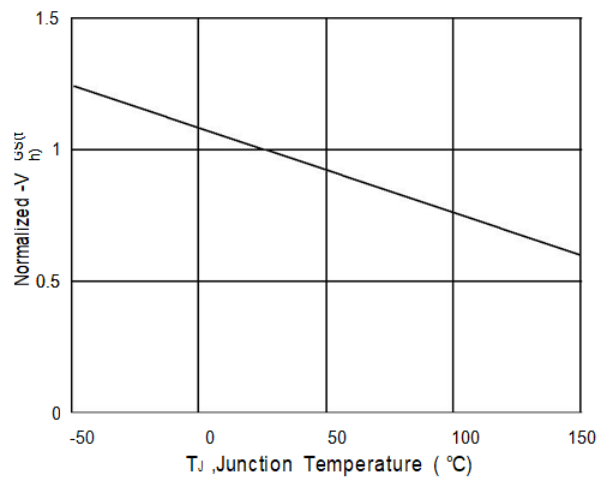


Fig.5 Normalized VGS(th) vs TJ

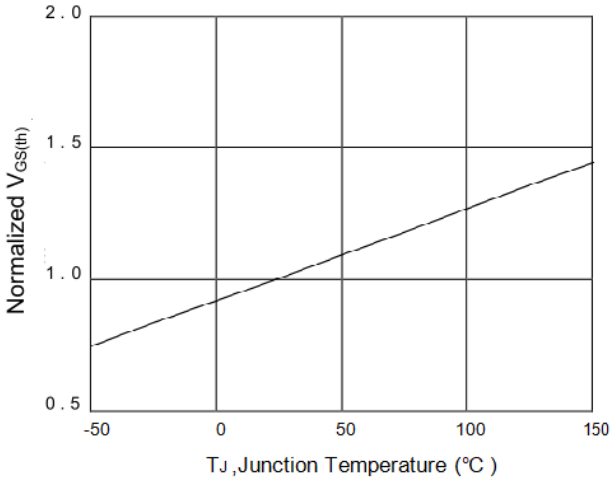


Fig.6 Normalized RDSON vs TJ

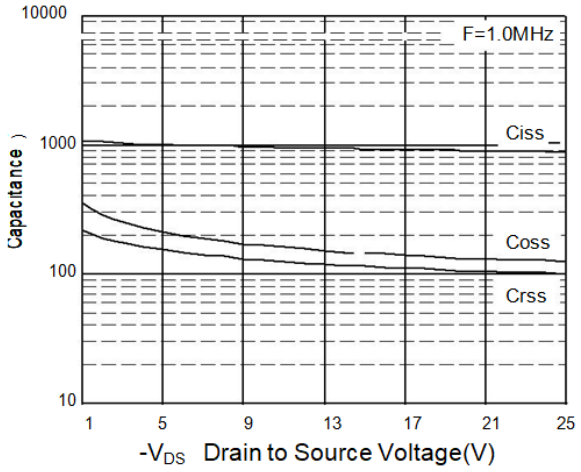


Fig.7 Capacitance

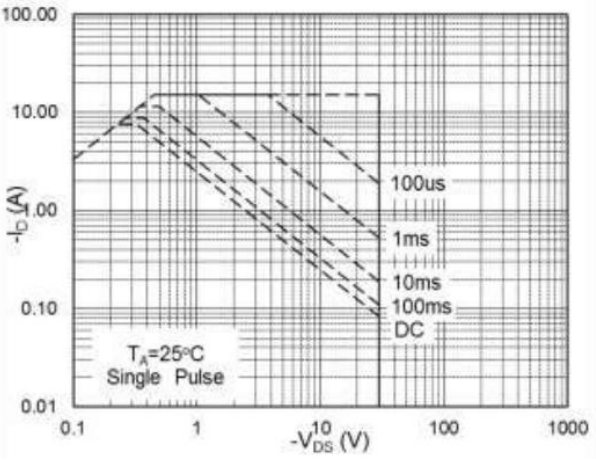


Fig.8 Safe Operating Area

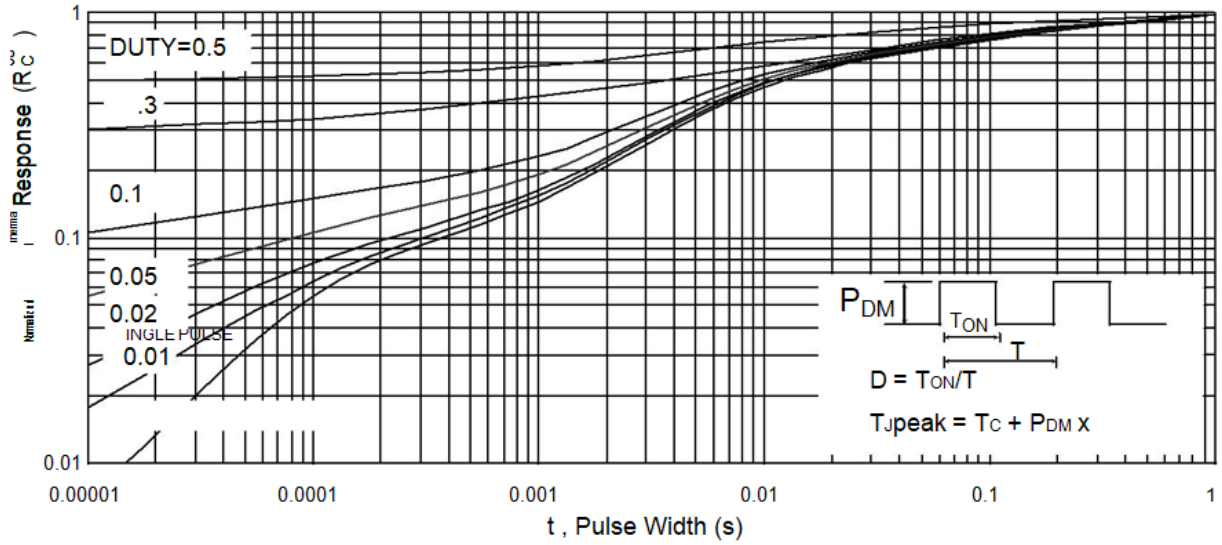


Fig.9 Normalized Maximum Transient Thermal Impedance

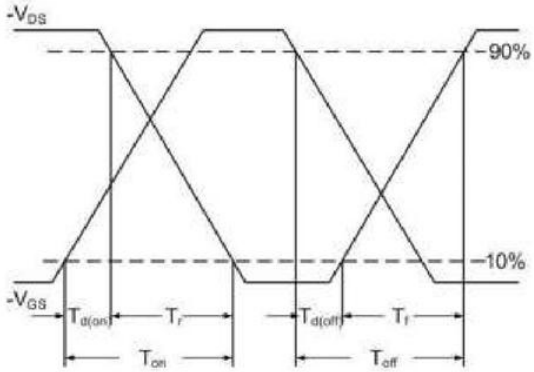


Fig.10 Switching Time Waveform

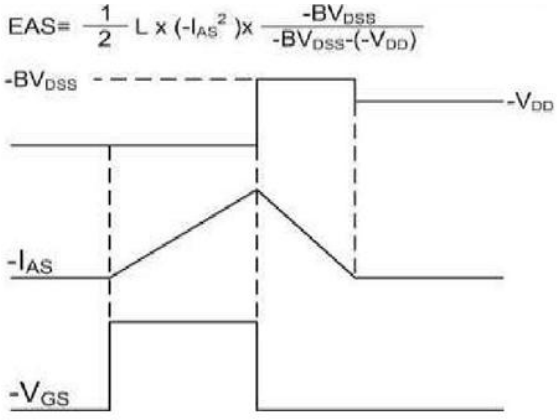
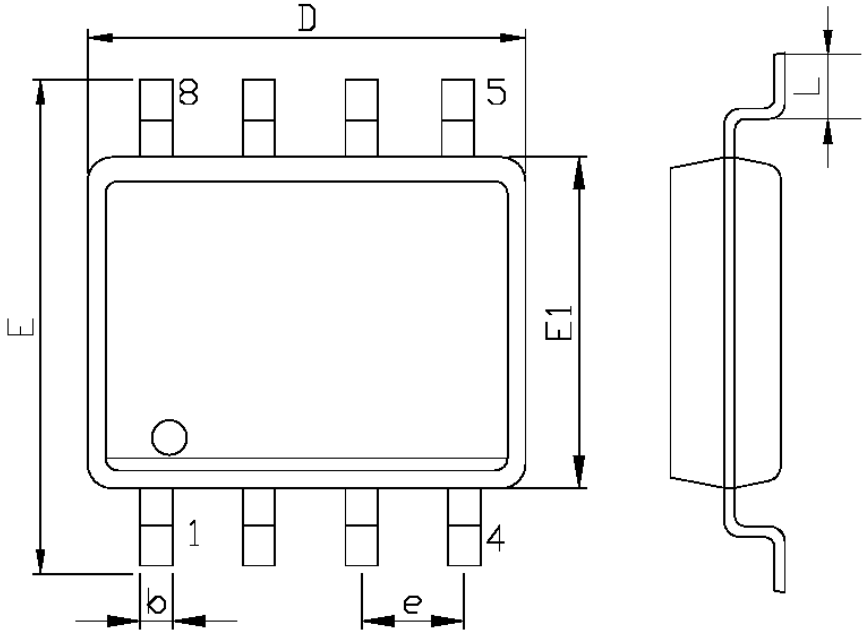
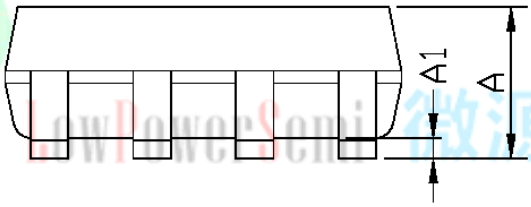


Fig.11 Unclamped Inductive Waveform

Packaging Information

SOP8





SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.90		0.193	
E	5.80	6.20	0.228	0.244
E1	3.90		0.153	
L	0.40	1.27	0.016	0.050
b	0.31	0.51	0.012	0.020
e	1.27		0.050	

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by LOWPOWER ***manufacturer:***

Other Similar products are found below :

614233C 648584F MCH3443-TL-E MCH6422-TL-E FDPF9N50NZ FW216A-TL-2W FW231A-TL-E APT5010JVR NTNS3A92PZT5G IRF100S201 JANTX2N5237 2SK2464-TL-E 2SK3818-DL-E FCA20N60_F109 FDZ595PZ STD6600NT4G FSS804-TL-E 2SJ277-DL-E 2SK1691-DL-E 2SK2545(Q,T) D2294UK 405094E 423220D MCH6646-TL-E TPCC8103,L1Q(CM 367-8430-0972-503 VN1206L 424134F 026935X 051075F SBVS138LT1G 614234A 715780A NTNS3166NZT5G 751625C 873612G IRF7380TRHR IPS70R2K0CEAKMA1 RJK60S3DPP-E0#T2 RJK60S5DPK-M0#T0 APT5010JVFR APT12031JFLL APT12040JVR DMN3404LQ-7 NTE6400 JANTX2N6796U JANTX2N6784U JANTXV2N5416U4 SQM110N05-06L-GE3 SIHF35N60E-GE3