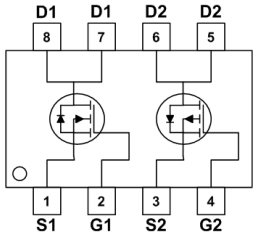
●General Description

The N-ch and P-ch MOSFET LH4614E has the low $R_{DS(on)}$,low gate charge,fast switching and excellent avalanche characteristics.This device is suitable for fast charge and lighting.



VDS =40V

RDS(ON)=7mΩ

ID =45A

VDS =-40V

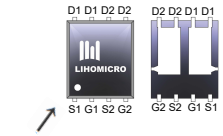
RDS(ON)=9mΩ

ID =-45A

●Features

- ■Green Device Available
- ■Super Low Gate Charge
- ■Excellent CdV/dt effect d ecline
- ■Advanced high cell density Tren ch technology

■ RoHS COMPLIANT



DFN5*6

●Ordering Information:

Part Number	LH4614E
Package	DFN5*6
Basic Ordering Unit (pcs)	5000
Normal Package Material Ordering Code	LH4614EN-DFN5*6-TAP
Halogen Free Ordering Code	LH4614EN-DFN5*6-TAP-HF

●Absolute Maximum Ratings（TC =25℃）

PARAMETER	SYMBOL	Value		UNIT
		N-ch	P-ch	
Drain-Source Breakdown Voltage	BV_{DSS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current[1]	I_D @TA=25℃	45	-45	A
	I_D@TA=100℃	33	-30	
Pulsed drain current[2]	I_{DM}	90	-90	A
Avalanche Energy[3]	E_{AS}	40	45	mJ
Avalanche Current	I_{AS}	15	-15	A
Power Dissipation @T_A=25℃[4]	P_D	2.5	45	W
Operating Temperature	T_J	-55~+150	-55~+150	℃
Storage Temperature	T_{STG}	-55~+150	-55~+150	℃

●N-Channel Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	40	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	1.0	1.5	2.5	V
Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=10A	--	7	10	mΩ
		V_{GS} =4.5V, I_D=4A	--	11	15	
Drain-Source Leakage Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=32V,V_{GS}=0V,T_J=125℃	--	--	5	
Gate-to-Source Leakage Current	I_{GSS}	VGS=±20V, VDS=0V	--	--	+100	nA
Input Capacitance	Ciss	V_{DS}=15V, V_{GS}=0V ,f=1MHz	--	690	--	pF
Output Capacitance	Coss		--	195	--	
Reverse Transfer Capacitance	Crss		--	38	--	
Turn-on delay time	Td(on)	V_{DD}=20V , V_{GS}=10V , R_G=3.3 ID=1A	--	14.3	--	ns
Rise time	Tr		--	5.5	--	
Turn -Off Delay Time	Td(off)		--	20	--	
Fall time	Tf		--	12	--	
Total Gate Charge(4.5V)	Qg	V_{DS}=20V , V_{GS}=4.5V , ID=10A	--	6.0	--	nC
Gate-to-Source Charge	Qgs		--	3.0	--	
Gate-to-Drain Charge	Qgd		--	1.5	--	
Continuous Diode Forward Current	I_S	VG=VD=0V, Force Currnet	--	--	45	A
Pulsed Diode Forward Current	I_{SM}		--	--	90	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=1A VGS =0V	--	--	1.2	V

●P-Channel Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=-250uA	-40	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=-250uA	-1.0	-1.5	-2.5	V
Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =-10V, $I_{D=}$-12A	--	9	12	mΩ
		V_{GS} =-4.5V, I_D=-4A	--	15	20	
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-32V,V_{GS}=0V,T_J=25℃	--	--	1	uA
		V_{DS}=-32V,V_{GS}=0V,T_J=25℃	--	--	5	
Gate-to-Source Leakage Current	I_{GSS}	VGS=±20V, VDS=0V	--	--	+100	nA
Input Capacitance	Ciss	V_{DS}=-15V, V_{GS}=0V ,f=1MHz	--	2760	--	pF
Output Capacitance	Coss		--	268	--	
Reverse Transfer Capacitance	Crss		--	80	--	
Turn-on delay time	Td(on)	V_{DD}=-15V , V_{GS}=-10V , RG=3.3 ID=-1A	--	48	--	ns
Rise time	Tr		--	23.8	--	
Turn -Off Delay Time	Td(off)		--	88	--	
Fall time	Tf		--	32	--	
Total Gate Charge(4.5V)	Qg	V_{DS}=-20V , V_{GS}=-4.5V , ID=-10A	--	23	--	nC
Gate-to-Source Charge	Qgs		--	10	--	
Gate-to-Drain Charge	Qgd		--	9.1	--	
Continuous Diode Forward Current	I_S	VG=VD=0V, Force Currnet	--	--	-45	A
Pulsed Diode Forward Current	I_{SM}		--	--	-90	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=-1A V_{GS} =0V	--	--	-1.2	V

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	3.1	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	50	℃/W

Notes:

1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

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

3.The N-Ch EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=30A;
The P-Ch EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=-30A

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

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

●N-ChannelTypical Characteristics

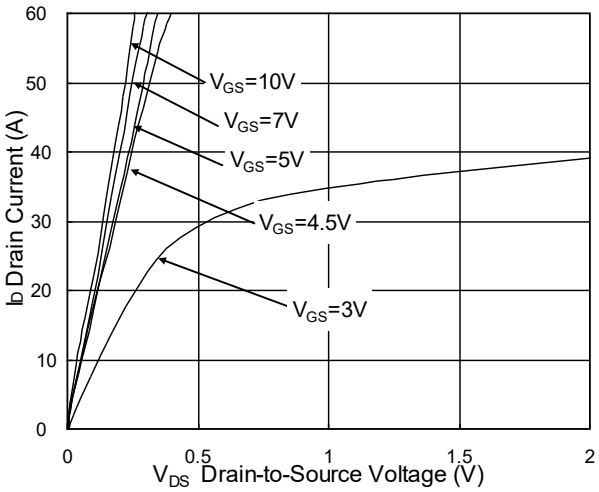


Fig.1 Typical Output Characteristics

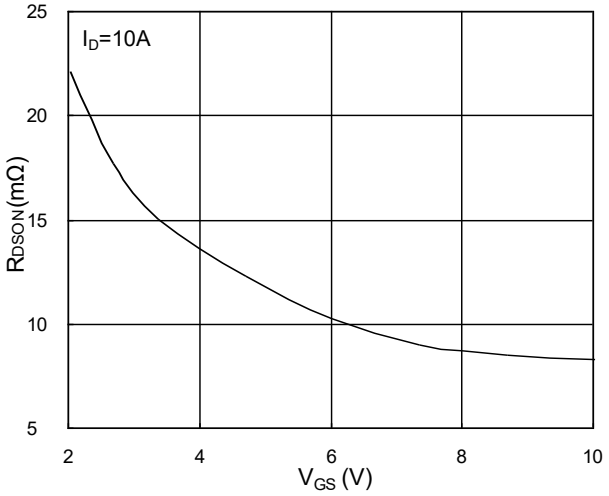


Fig.2 On-Resistance vs. G-S Voltage

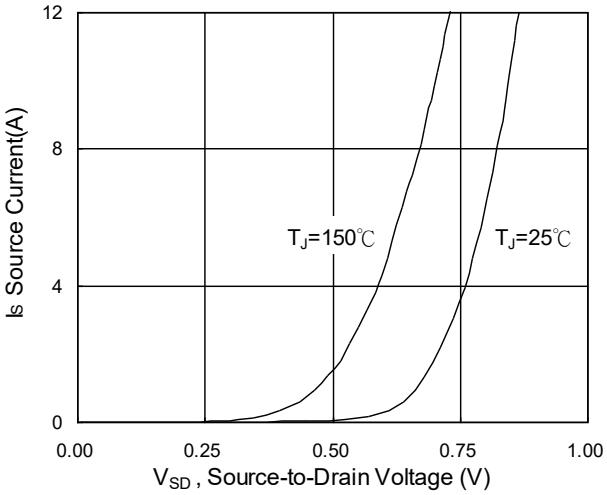


Fig.3 Source Drain Forward Characteristics

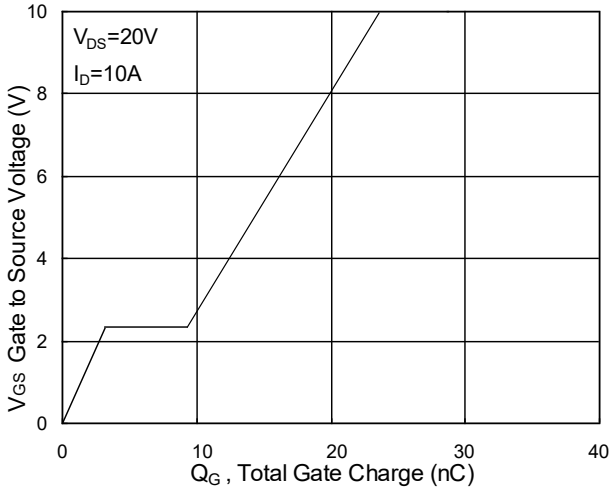


Fig.4 Gate-Charge Characteristics

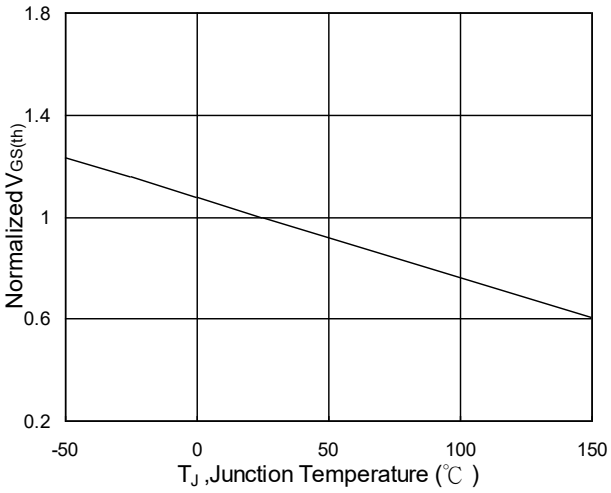


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

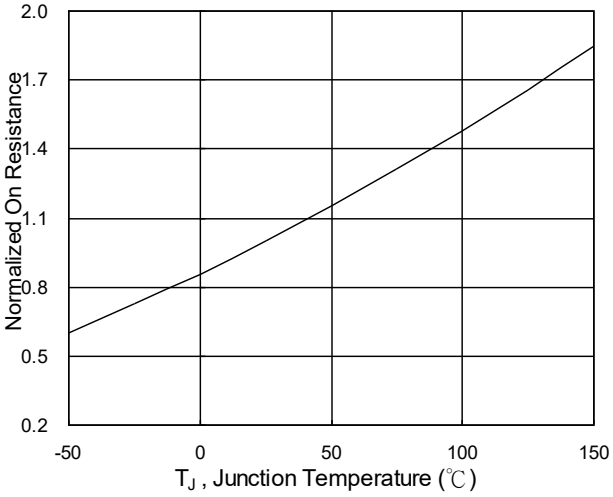


Fig.6 Normalized R_{DSON} vs. T_J

•N-ChannelTypical Characteristics（cont.）

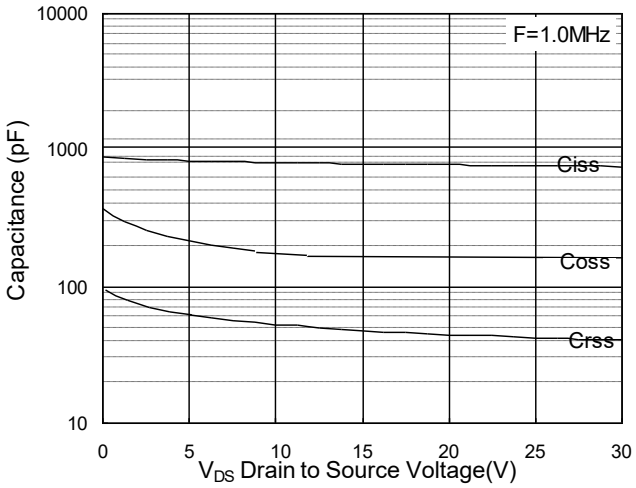


Fig.7 Capacitance

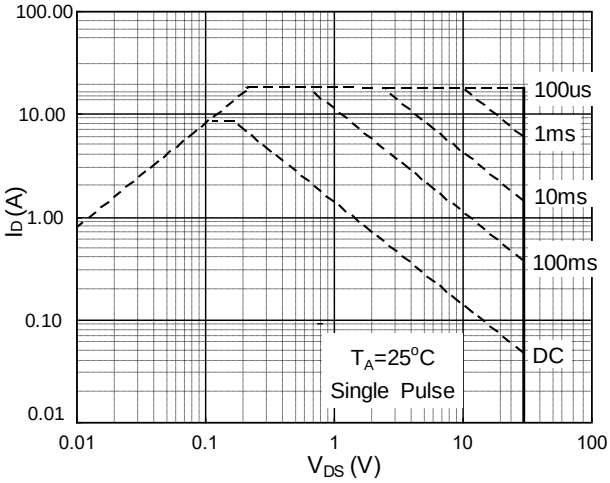


Fig.8 Safe Operating Area

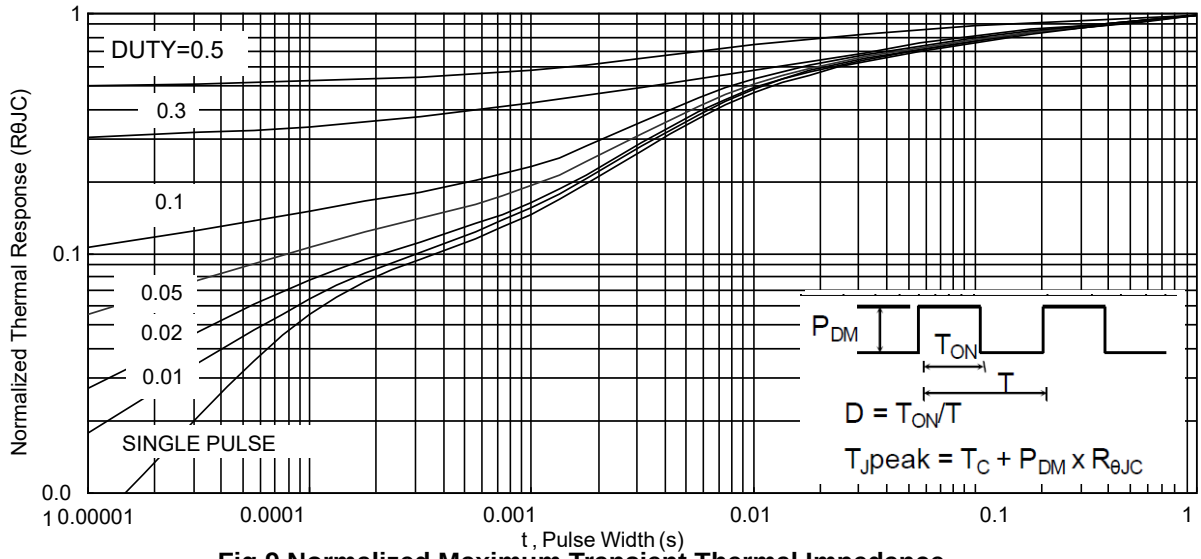


Fig.9 Normalized Maximum Transient Thermal Impedance

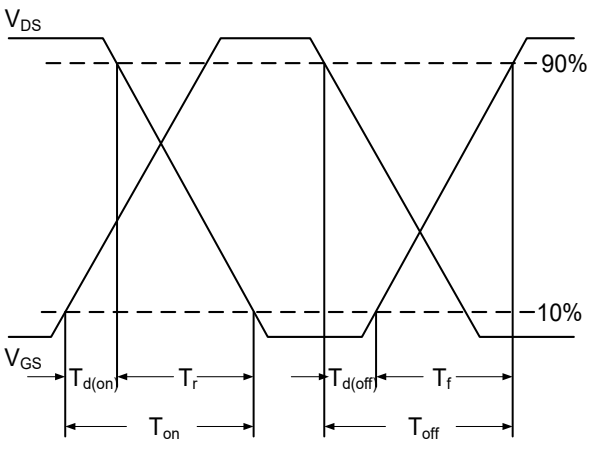


Fig.10 Switching Time Waveform

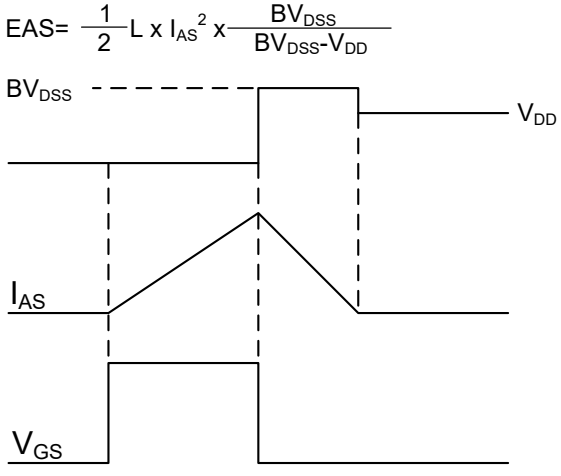


Fig.11 Unclamped Inductive Waveform

•P-ChannelTypical Characteristics（cont.）

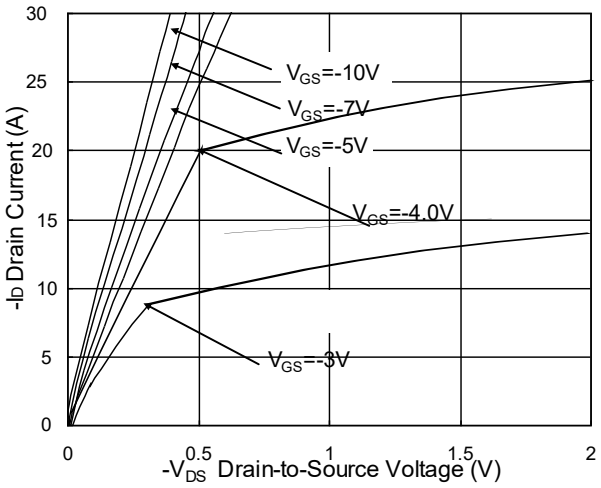


Fig.1 Typical Output Characteristics

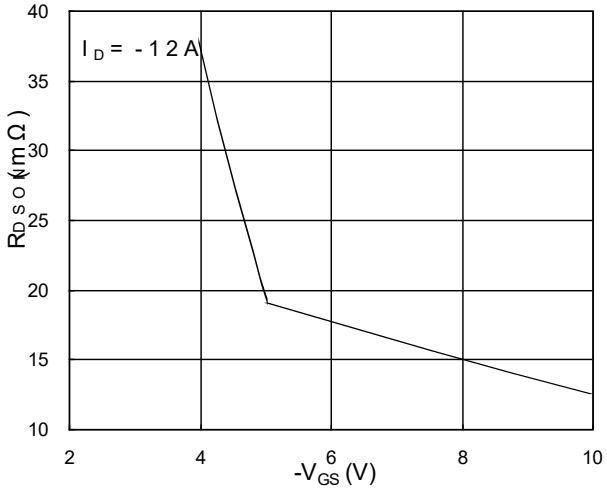


Fig.2 On-Resistance vs. G-S Voltage

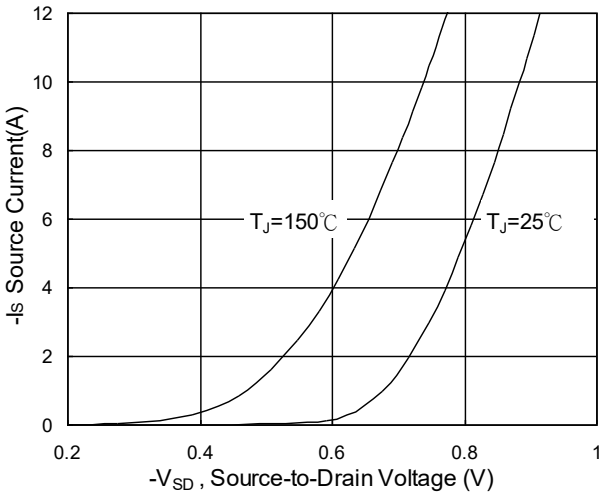


Fig.3 Source Drain Forward Characteristics

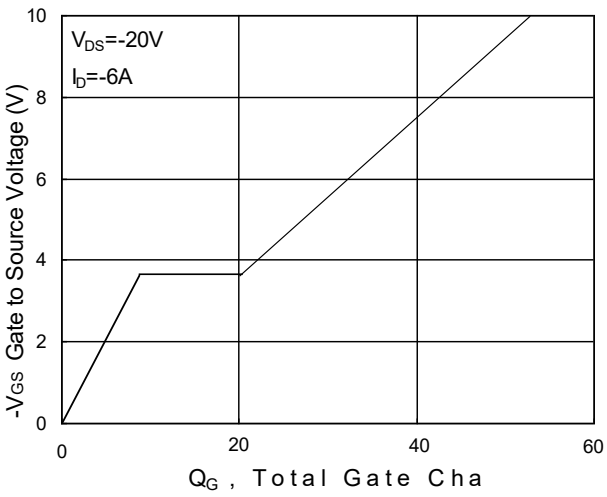


Fig.4 Gate-Charge Characteristics

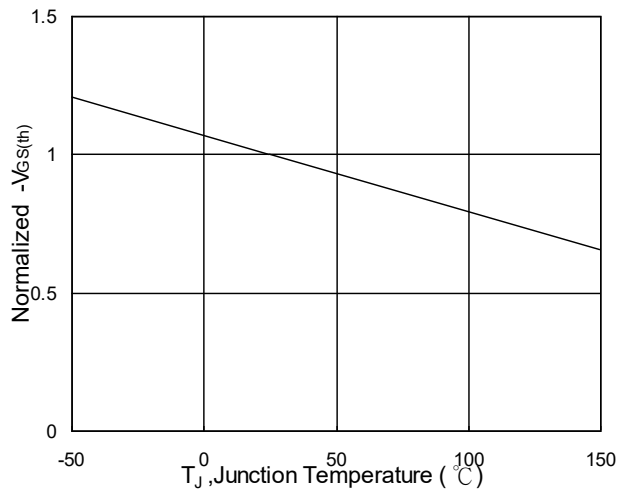


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

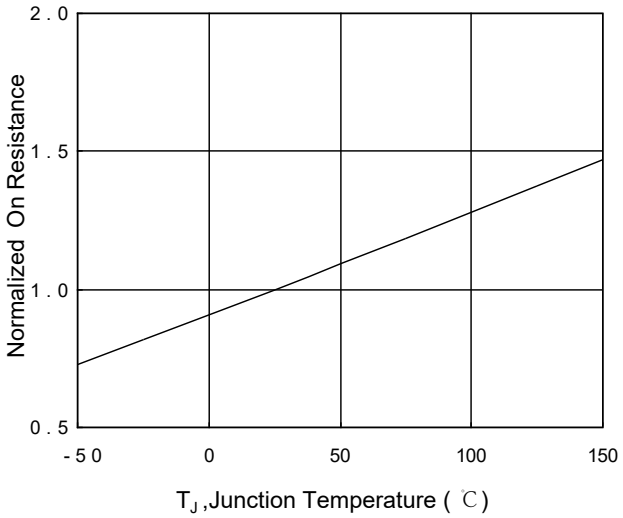


Fig.6 Normalized RDS_{ON} vs. T_J

•P-ChannelTypical Characteristics（cont.）

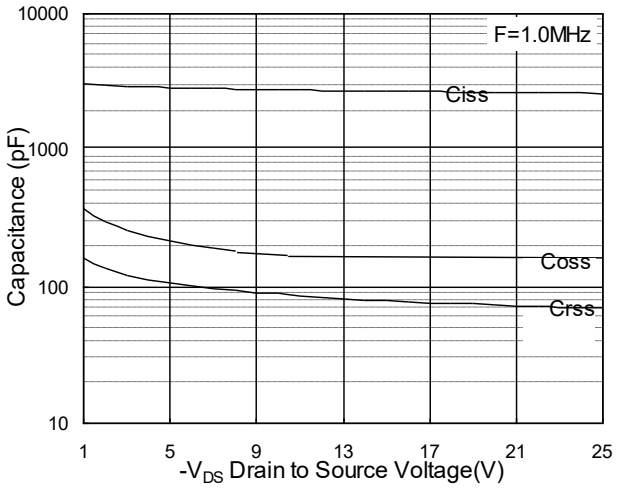


Fig.7 Capacitance

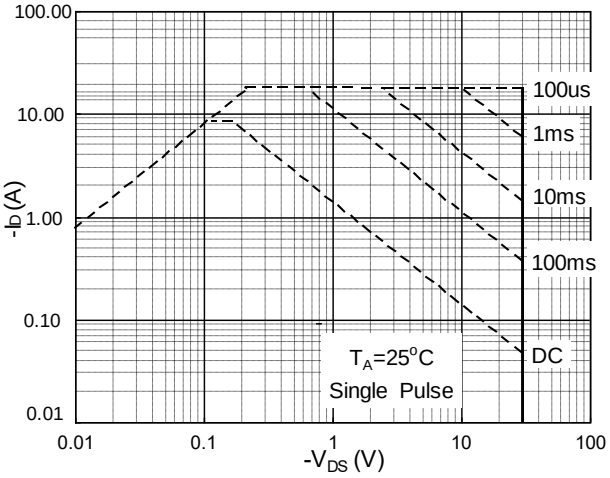


Fig.8 Safe Operating Area

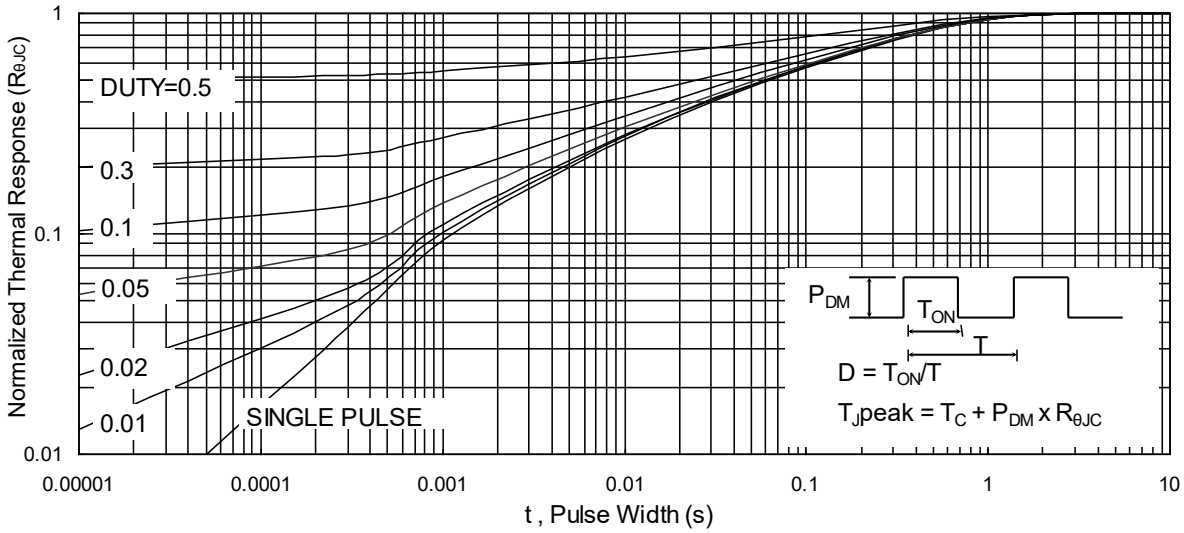


Fig.9 Normalized Maximum Transient Thermal Impedance

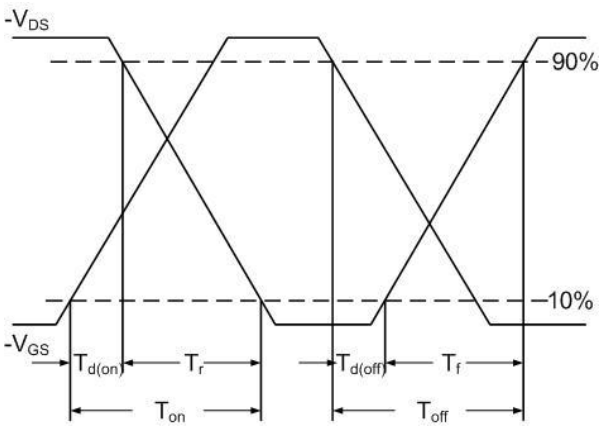


Fig.10 Switching Time Waveform

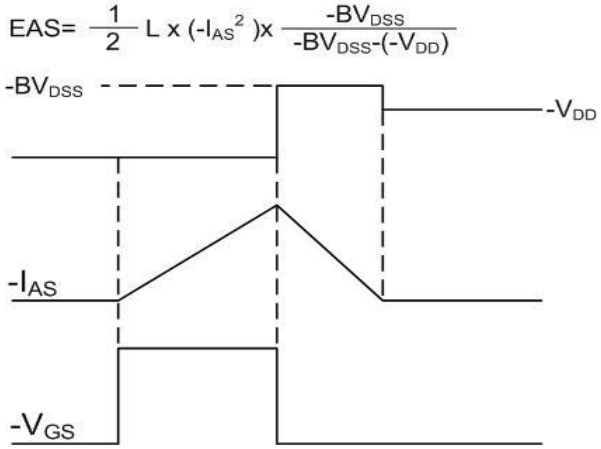


Fig.11 Unclamped Inductive Waveform

●Dimensions（DFN5*6)

Unit：mm

SYMBOL	min	max	SYMBOL	min	max
A	1.00	1.20	E1	5.90	6.40
b	0.30	0.50	e	1.27BSC	
c	0.20	0.30	L	0.05	0.30
D	4.80	5.20	L1	0.40	0.80
D1	3.90	4.30	L2	1.20	2.00
D2	1.50	1.90	H	3.30	3.80
D3	0.40	0.80	I	-	0.18
E	5.50	5.90