



**N+P-Channel Advanced Power MOSFET**

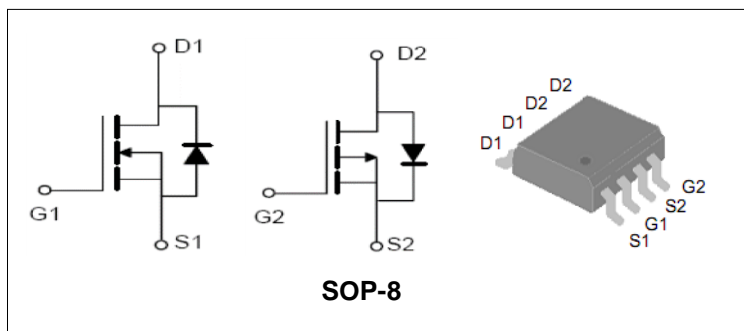
**Features**

- Improved dv/dt Capability, High Ruggedness
- Maximum Junction Temperature Range (150°C)

**Applications**

- PWM applications
- Load switch
- Power management

N-Channel		
BVDSS	20	V
ID	6	A
RDSON@VGS=4.5V	12	mΩ
RDSON@VGS=2.5V	14	mΩ



P-Channel		
BVDSS	-20	V
ID	-5	A
RDSON@VGS=-4.5V	29	mΩ
RDSON@VGS=-2.5V	34	mΩ

**Order Information**

Product	Package	Marking	Reel Size	Reel	Carton
PTS4624	SOP-8	PTS4624	13inch	3000PCS	48000PCS

**Absolute Maximum Ratings**

Symbol	Parameter		N-Channel	P-Channel	Unit
<b>Common Ratings (TC=25°C Unless Otherwise Noted)</b>					
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		20	-20	V
$V_{GS}$	Gate-Source Voltage		±12	±20	V
$T_J$	Maximum Junction Temperature		150	150	°C
$T_{STG}$	Storage Temperature Range		-55 to 150	-55 to 150	°C
$I_S$	Diode Continuous Forward Current	TA =25°C	6	-5	A
<b>Mounted on Large Heat Sink</b>					
$I_{DM}$	Pulse Drain Current Tested (Silicon Limit) (Note1)	TA =25°C	24	-20	A
$I_D$	Continuous Drain current	TA =25°C	6	-5	A
$P_D$	Maximum Power Dissipation	TA =25°C	2		W
$R_{θJA}$	Thermal Resistance Junction-to-Ambient (Note2)		62.5		°C/W



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## N-Channel Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain current	VDS=20V,VGS=0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	VDS=VGS,ID=250μA	0.45	0.65	1.0	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance (Note3)	VGS=4.5V, ID=5A	--	12	18	mΩ
		VGS=2.5V, ID=3.5A	--	14	27	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) (Note4)</b>						
C <sub>iss</sub>	Input Capacitance	VDS= 10V, VGS=0V, F=1MHz	--	420	--	pF
C <sub>oss</sub>	Output Capacitance		--	85	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	11	--	pF
Q <sub>g</sub>	Total Gate Charge	VDS= 10V, ID= 3A, VGS=4.5V	--	10.5	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	3.1	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	3.0	--	nC
<b>Switching Characteristics (Note4)</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	VDD= 10V, VGS=10V ID=3A, RG=3.3Ω	--	4.5	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	3	--	nS
t <sub>d(off)</sub>	Turn-off Delay Time		--	12	--	nS
t <sub>f</sub>	Turn-off Fall Time		--	2	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage (Note3)	IS=4A,VGS=0V	--	0.82	1.2	V



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## P-Channel Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>(BR)DSS</sub>	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain current	VDS=-20V,VGS=0V	--	--	-1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
V <sub>GS(TH)</sub>	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-0.45	-0.75	-1.1	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance (Note5)	VGS=-4.5V, ID=-5.A	--	29	36	mΩ
		VGS=-2.5V, ID=-2.5A	--	34	49	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) (Note4)</b>						
C <sub>iss</sub>	Input Capacitance	VDS= -10V,	--	560	--	pF
C <sub>oss</sub>	Output Capacitance	VGS=0V,	--	50	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	F=1MHz	--	35	--	pF
Q <sub>g</sub>	Total Gate Charge	VDS= -10V,	--	12	--	nC
Q <sub>gs</sub>	Gate-Source Charge	ID= -2A,	--	3.6	--	nC
Q <sub>gd</sub>	Gate-Drain Charge	VGS= -4.5V	--	2.3	--	nC
<b>Switching Characteristics (Note6)</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	VDD=- 10V,	--	8	--	nS
t <sub>r</sub>	Turn-on Rise Time	RG=3.3Ω,	--	5	--	nS
t <sub>d(off)</sub>	Turn-off Delay Time	ID=-1A,	--	22	--	nS
t <sub>f</sub>	Turn-off Fall Time	VGS=-4.5V	--	8.5	--	nS
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
V <sub>SD</sub>	Forward on voltage (Note5)	IS=-4A,VGS=0V	--	-0.8	-1.2	V

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



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Typical Characteristics(N-Channel)

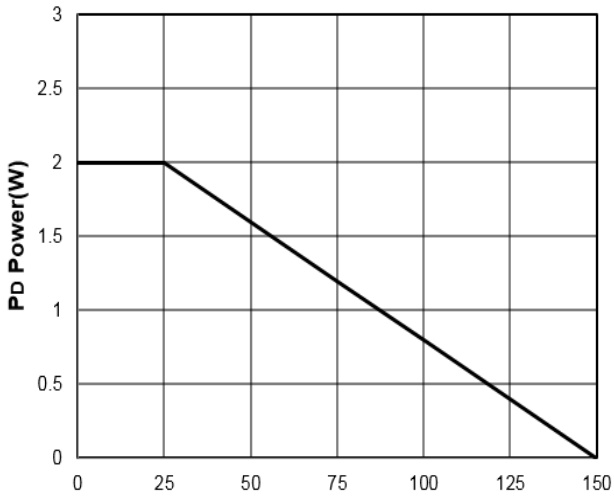


Figure1: T<sub>j</sub> Junction Temperature (°C)

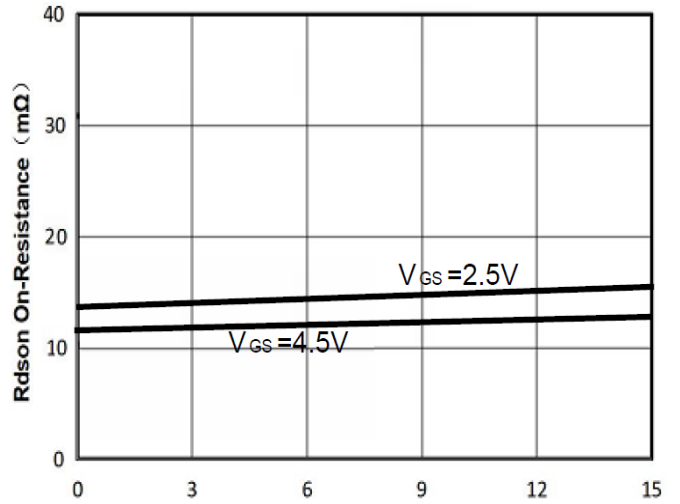


Figure2: I<sub>d</sub> Drain Current (A)

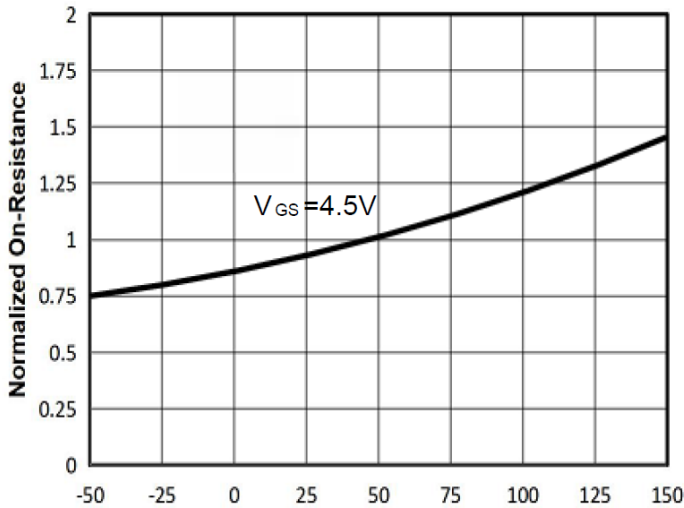


Figure3 : T<sub>j</sub> Junction Temperature (°C)

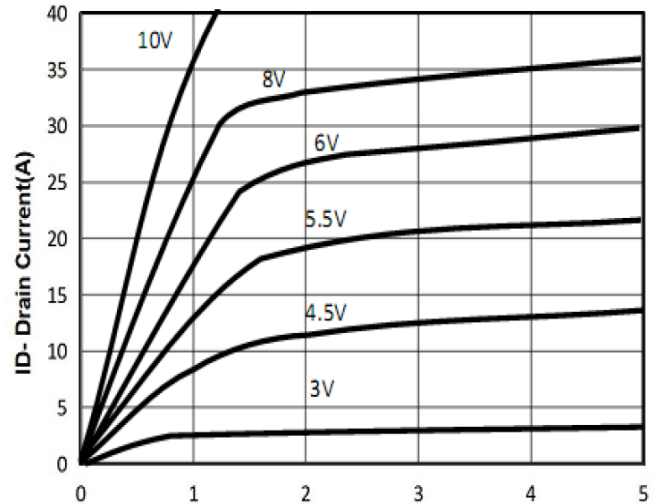


Figure4 : V<sub>ds</sub> Drain-Source Voltage (V)

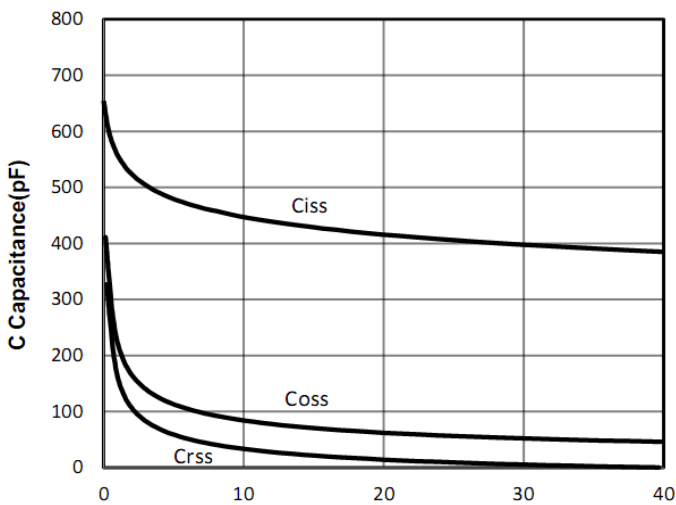


Figure5: V<sub>ds</sub> Drain-Source Voltage (V)

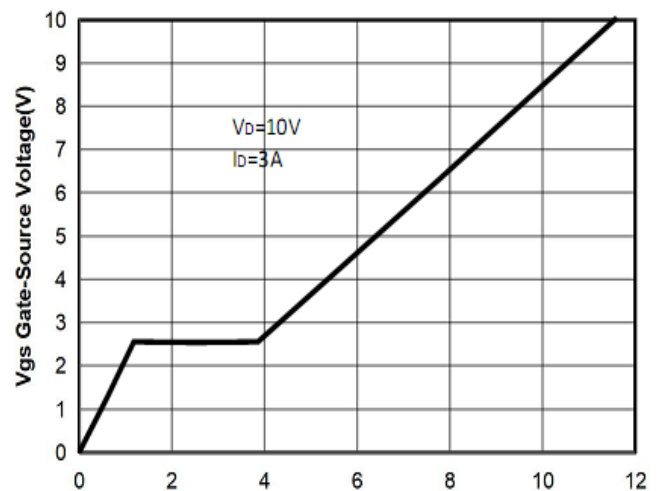


Figure6: Q<sub>g</sub> Gate Charge (nC)



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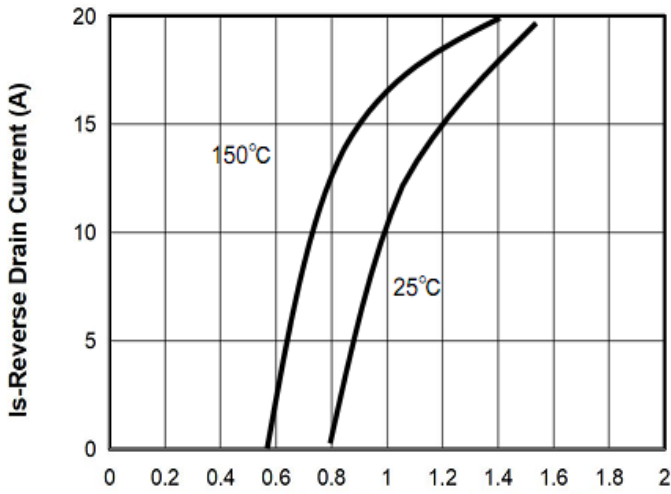


Figure7: Vsd Source-Drain Voltage (V)

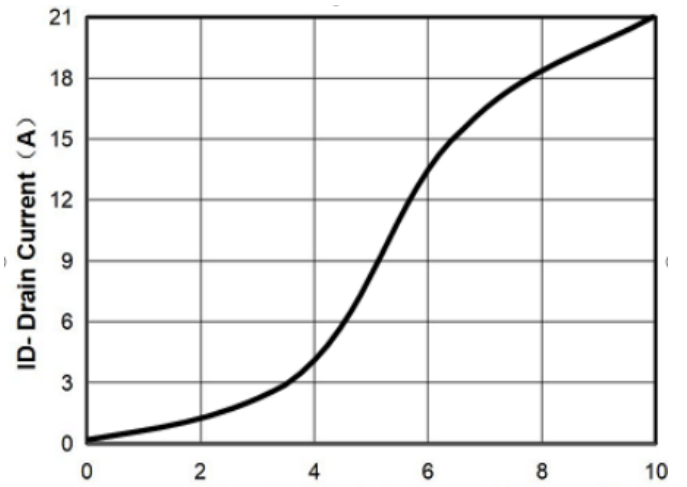


Figure8: Vgs Gate-Source Voltage (V)

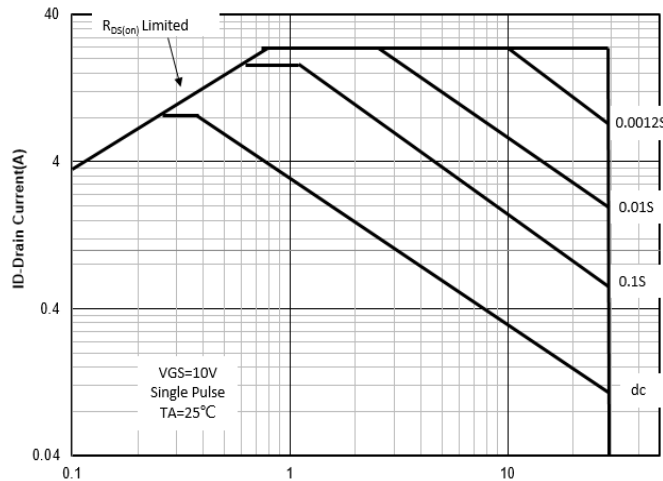


Figure9: VDS Drain -Source Voltage (V)

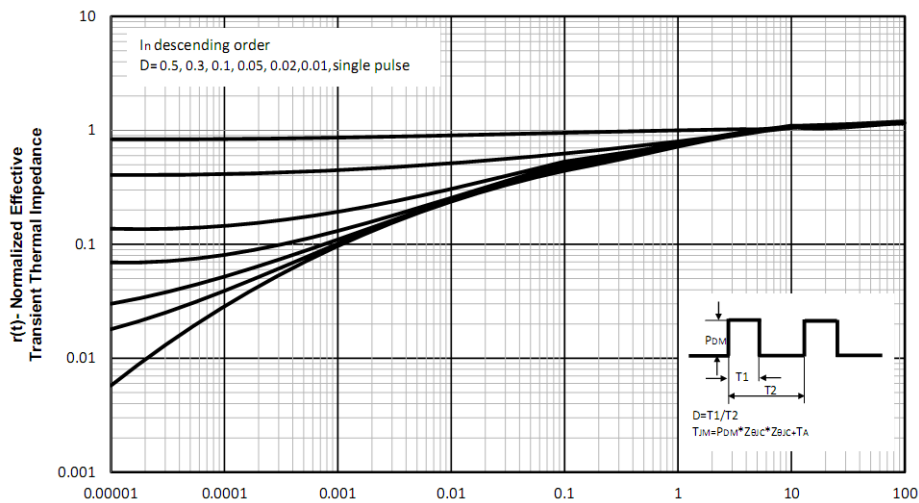


Figure10: Square Wave Pulse Duration (sec)

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Test Circuit and Waveform(N-Channel):

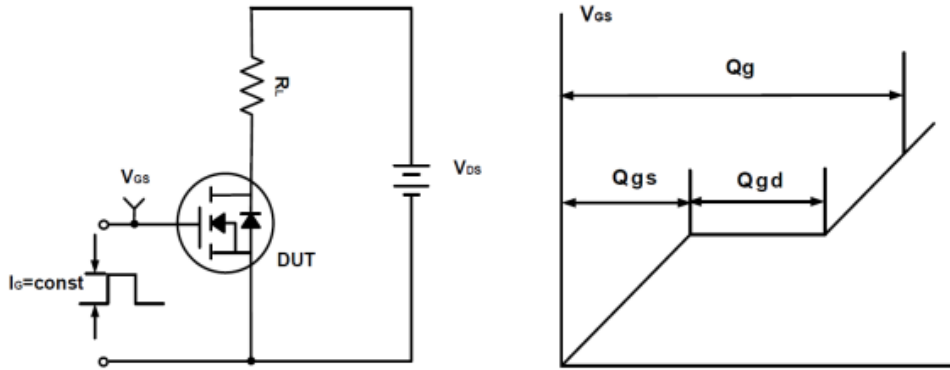


Figure A Gate Charge Test Circuit & Waveforms

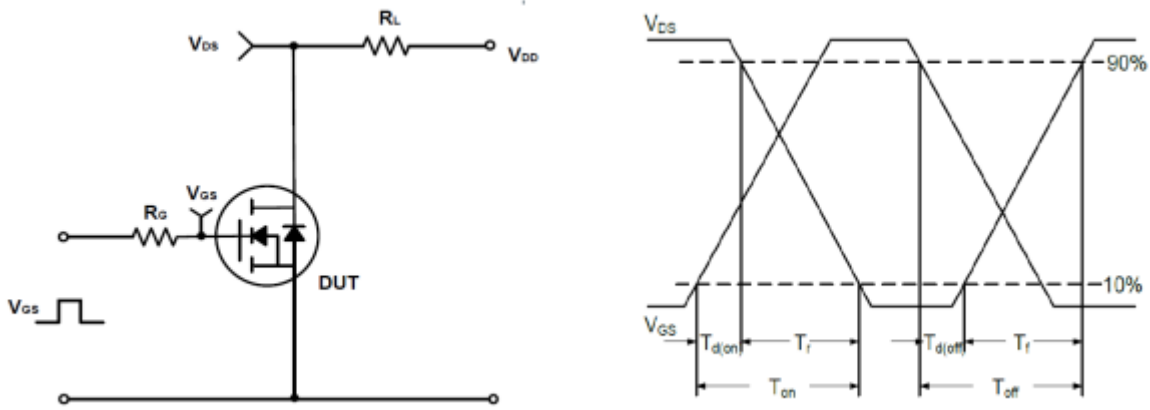


Figure B Switching Test Circuit & Waveforms

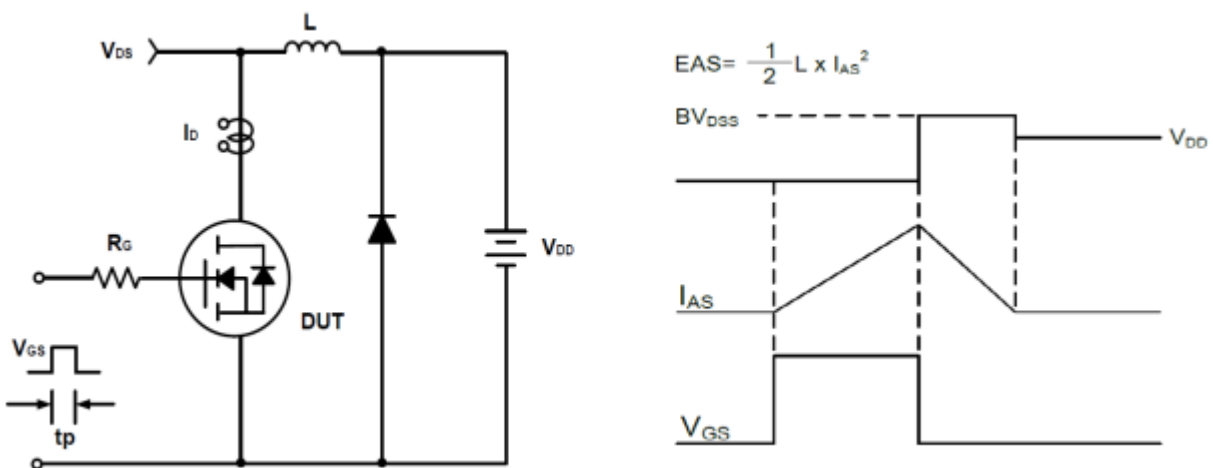


Figure C Unclamped Inductive Switching Circuit & Waveforms



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Typical Characteristics(P-Channel)

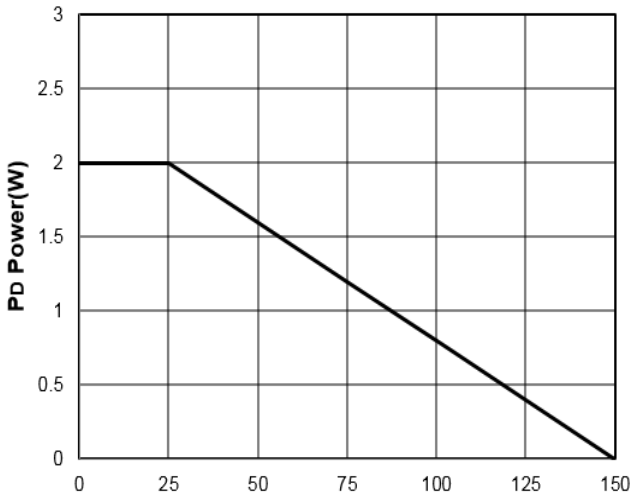


Figure11: Tj Junction Temperature (°C)

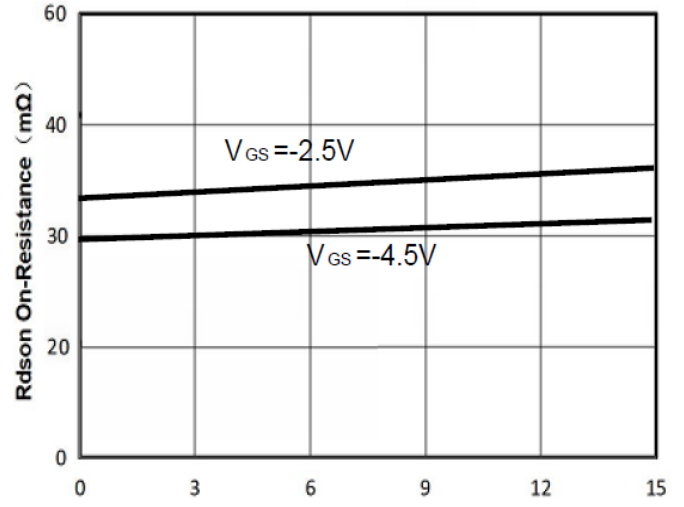


Figure12: -Id Drain Current (A)

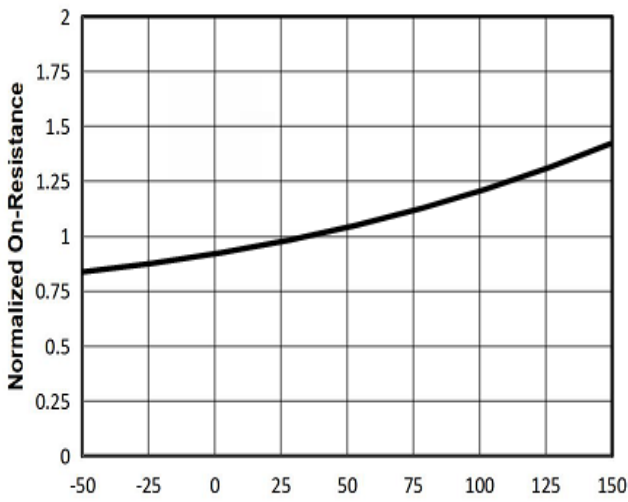


Figure13: Tj Junction Temperature (°C)

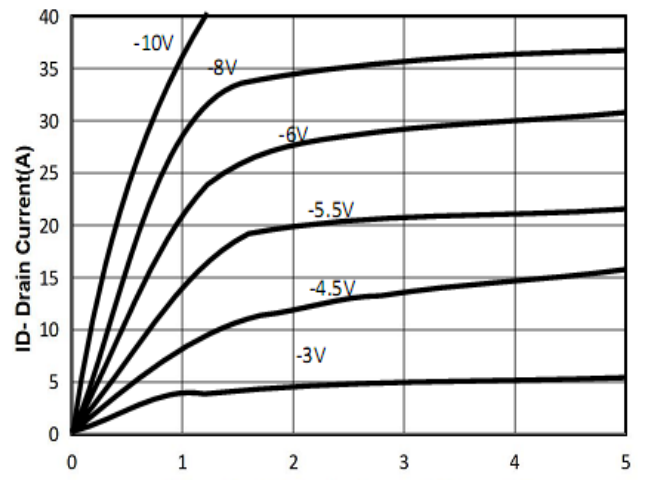


Figure14: -Vds Drain-Source Voltage (V)

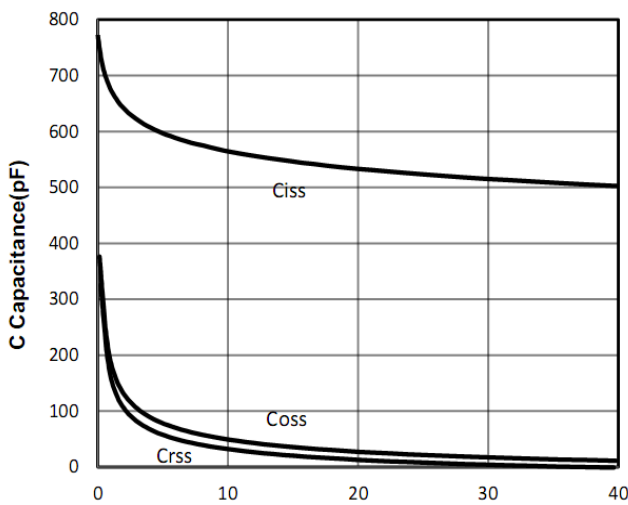


Figure15: -Vds Drain-Source Voltage (V)

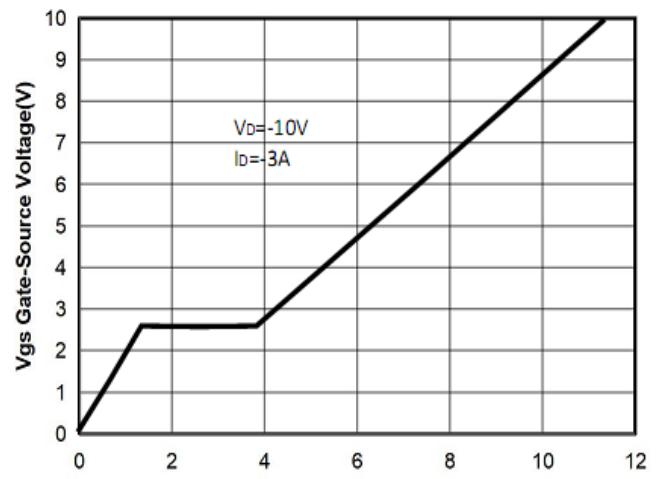


Figure16: Qg Gate Charge (nC)



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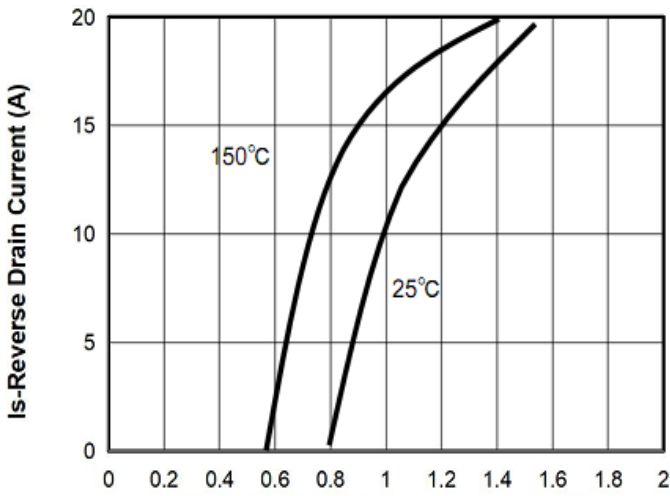


Figure17: Vsd Source-Drain Voltage (V)

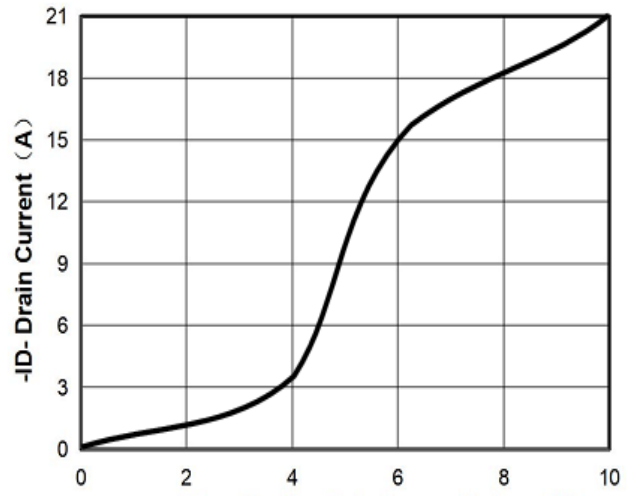


Figure18: -Vgs Gate-Source Voltage (V)

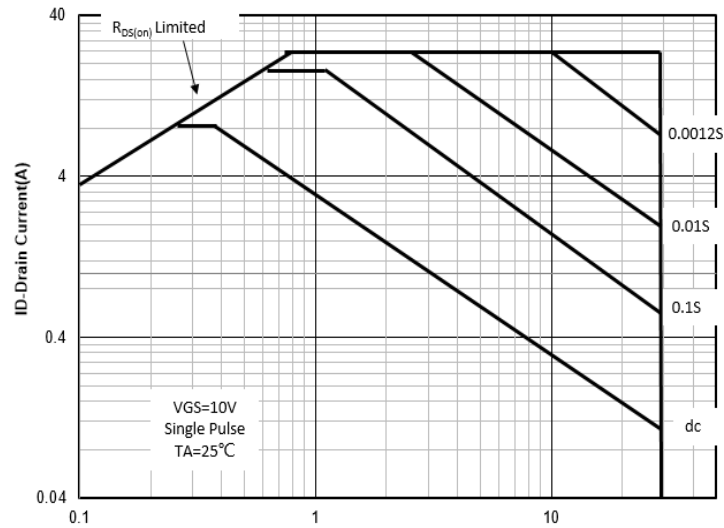


Figure19: VDS Drain-Source Voltage (V)

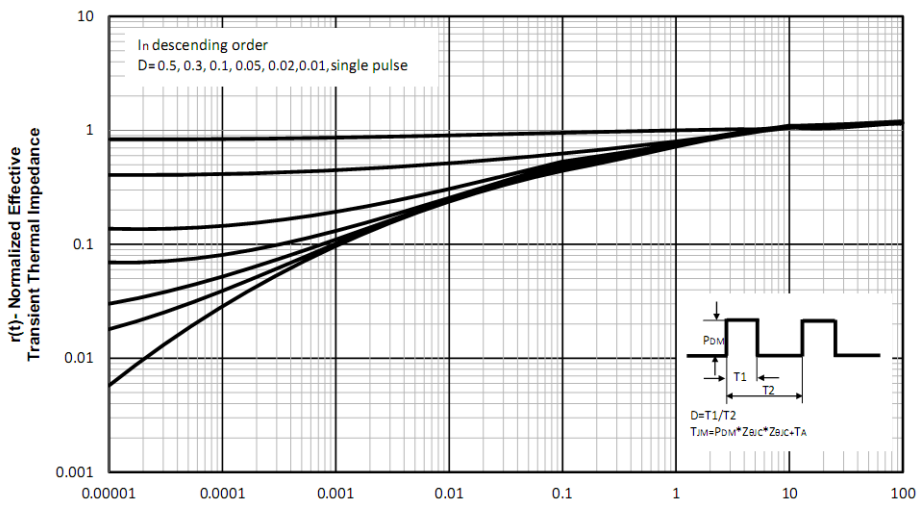


Figure20: Square Wave Pulse Duration (sec)



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Test Circuit and Waveform(P-Channel):

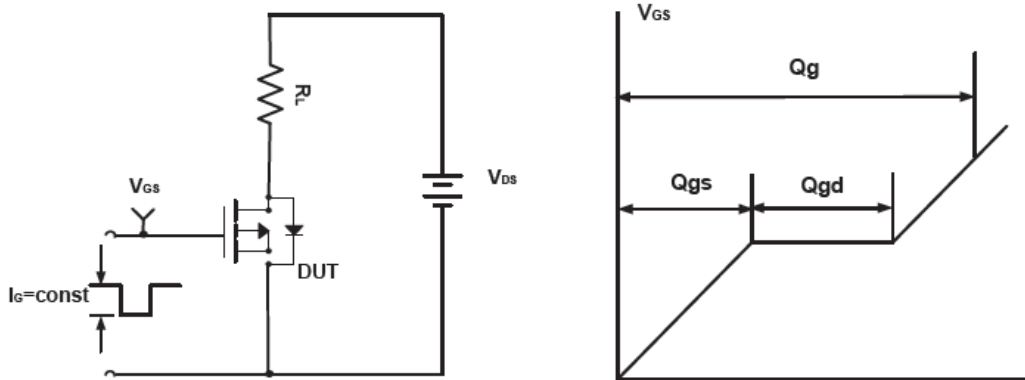


Figure D Gate Charge Test Circuit & Waveforms

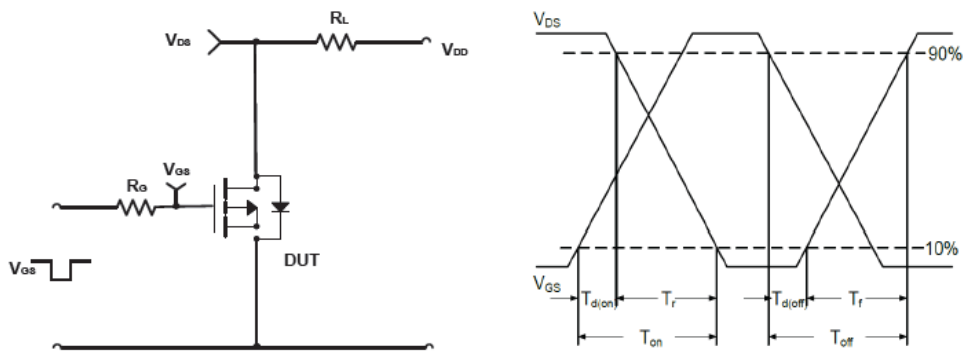


Figure E Switching Test Circuit & Waveforms

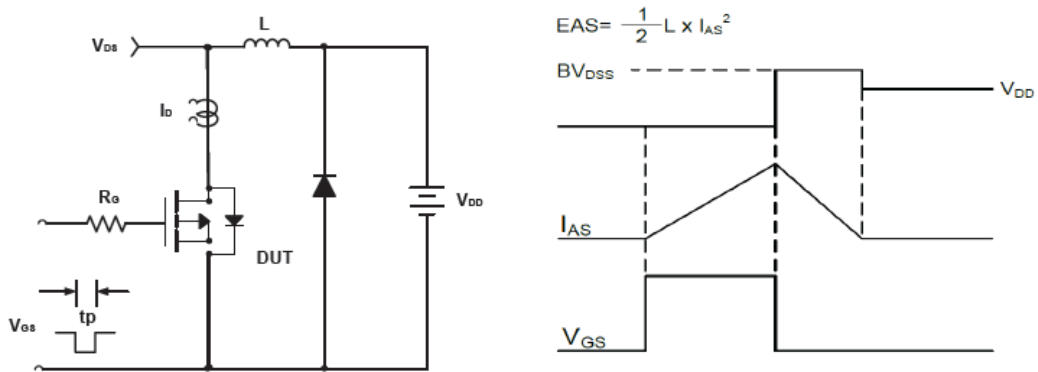
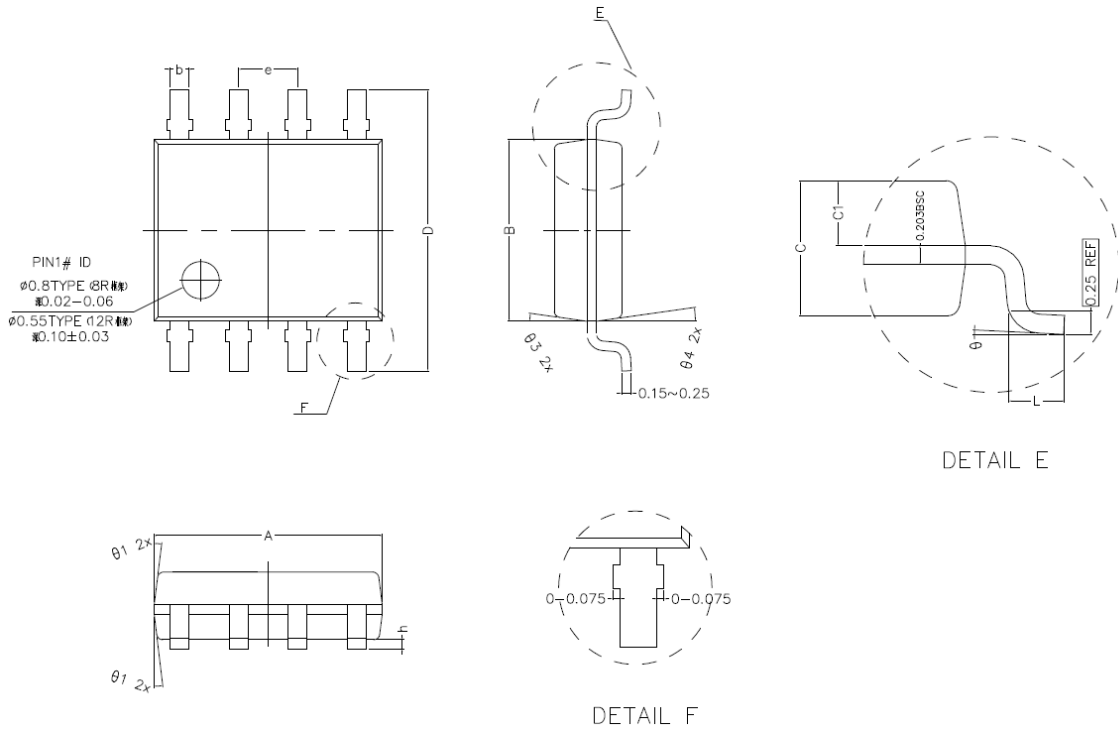


Figure F Unclamped Inductive Switching Circuit & Waveforms

**N+P-Channel Advanced Power MOSFET**
**SOP-8 Package Outline Dimensions (Units: mm)**


COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A	4.800	4.900	5.000
B	3.800	3.900	4.000
C	1.350	1.450	1.550
C1	0.650	0.700	0.750
D	5.900	6.100	6.300
L	0.500	0.600	0.700
b	0.350	0.400	0.450
h	0.050	0.150	0.250
e	1.270TYPE		
θ <sub>1</sub>	7° TYPE(8R)		12° TYPE(12R)
θ <sub>2</sub>	7° TYPE(8R)		10° TYPE(12R)
θ <sub>3</sub>	8° TYPE(8R)		12° TYPE(12R)
θ <sub>4</sub>	8° TYPE(8R)		10° TYPE(12R)
θ	0° ~ 8°		