PTS4614

N+P-Channel Advanced Power MOSFET

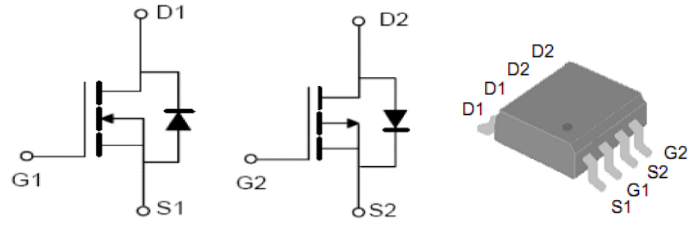
Features

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

Applications

- PWM applications
- Load switch
- Power management

N-Channel		
BVDSS	40	V
ID	8	A
RDSON@VGS=10V	14	mΩ
RDSON@VGS=5V	18	mΩ



SOP-8

P-Channel		
BVDSS	-40	V
ID	-7	A
RDSON@VGS=-10V	27	mΩ
RDSON@VGS=-5V	33	mΩ

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTS4614	SOP-8	PTS4614	13inch	3000PCS	48000PCS

Absolute Maximum Ratings

Symbol	Parameter		N-Channel	P-Channel	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)					
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		40	-40	V
V_{GS}	Gate-Source Voltage		±20	±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	8	-7	A
Mounted on Large Heat Sink					
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note1)	TA =25°C	32	-28	A
I_D	Continuous Drain current	TA =25°C	8	-7.5	A
P_D	Maximum Power Dissipation	TA =25°C	2		W
$R_{\theta JA}$	Thermal Resistance Junction−to−Ambient (Note2)		62.5		°C/W

N+P-Channel Advanced Power MOSFET

N-Channel Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=40V,VGS=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.0	2.0	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note3)	VGS=10V, ID=7A	--	14	20	mΩ
		VGS=5V, ID=3.5A	--	18	30	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	VDS=20V, VGS=0V, F=1MHz	--	450	--	pF
C_{oss}	Output Capacitance		--	105	--	pF
C_{rss}	Reverse Transfer Capacitance		--	10	--	pF
Q_g	Total Gate Charge	VDS= 20V, ID= 4A, VGS=4.5V	--	12.5	--	nC
Q_{gs}	Gate-Source Charge		--	3.3	--	nC
Q_{gd}	Gate-Drain Charge		--	3.2	--	nC
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-on Delay Time	VDD=20V, ID=3A, R_G=3.3Ω, V_{GS}=10V	--	5	--	nS
t_r	Turn-on Rise Time		--	3.2	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	15	--	nS
t_f	Turn-off Fall Time		--	2.1	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	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
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	VGS=0V ID=-250μA	-40	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=-40V,VGS=0V	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=-250μA	-1	-2.0	-3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note5)	VGS=-10V, ID=-7A	--	27	35	mΩ
		VGS=-5V, ID=-3A	--	33	45	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	VDS= -20V, VGS=0V, F=1MHz	--	550	--	pF
C_{oss}	Output Capacitance		--	110	--	pF
C_{rss}	Reverse Transfer Capacitance		--	55	--	pF
Q_g	Total Gate Charge	VDS= -20V, ID= -3A, VGS= -4.5V	--	13	--	nC
Q_{gs}	Gate-Source Charge		--	4	--	nC
Q_{gd}	Gate-Drain Charge		--	3	--	nC
Switching Characteristics (Note6)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-20V, I_D=-6A, R_G=3.3Ω, V_{GS}=-4.5V	--	8	--	nS
t_r	Turn-on Rise Time		--	5	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	22	--	nS
t_f	Turn-off Fall Time		--	8.5	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage (Note5)	IS=-4A,VGS=0V	--	-0.83	-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.

N+P-Channel Advanced Power MOSFET

Typical Characteristics(N-Channel)

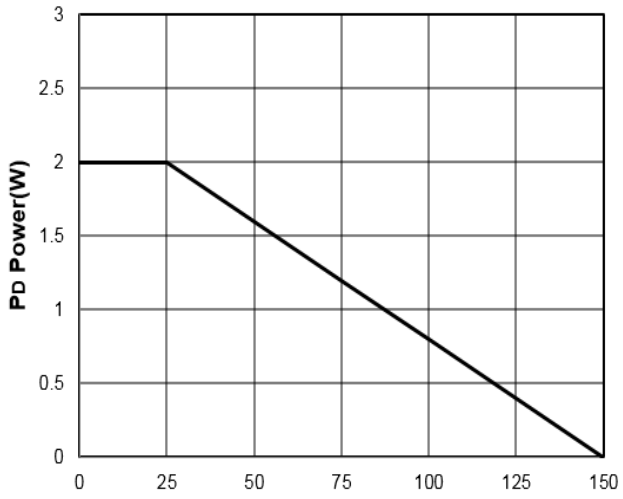


Figure1：T_J Junction Temperature（°C）

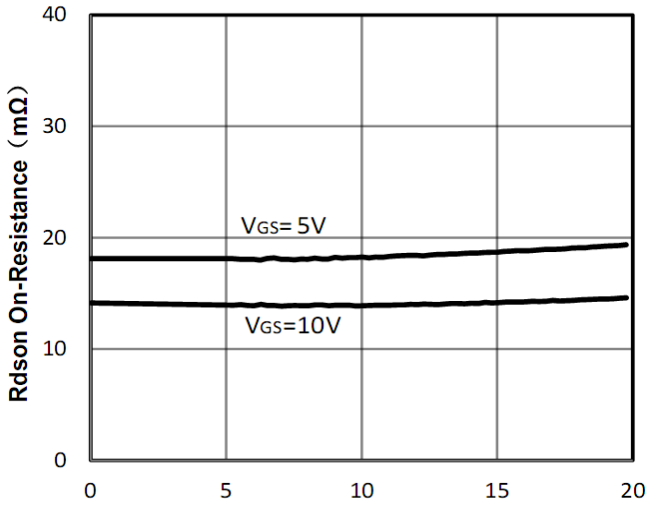


Figure2：I_D Drain Current（A）

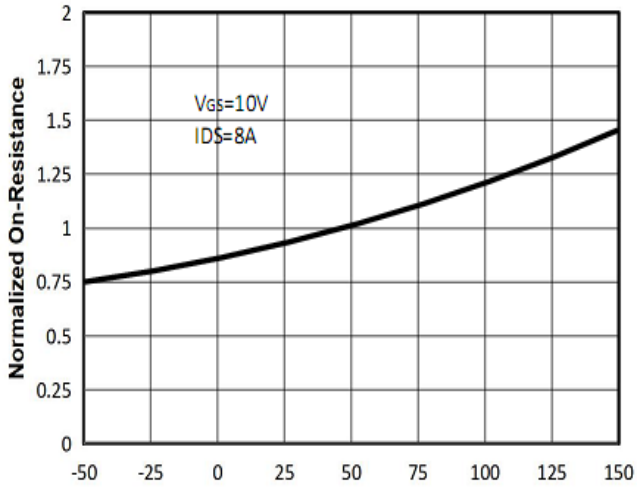


Figure3 ： T_J Junction Temperature （ °C ）

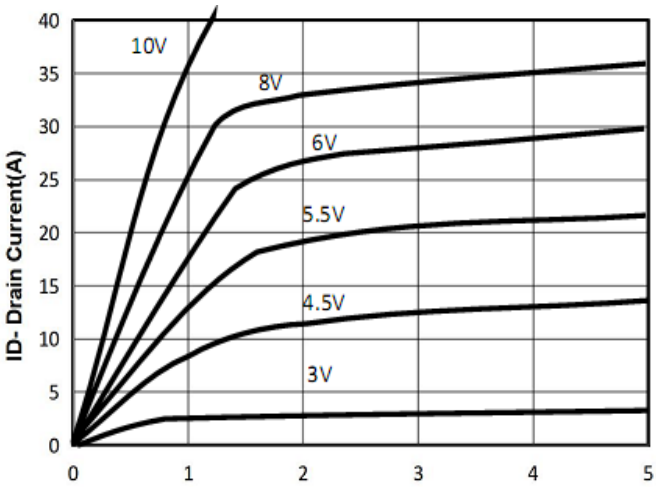


Figure4 ： V_{DS} Drain-Source Voltage （ V ）

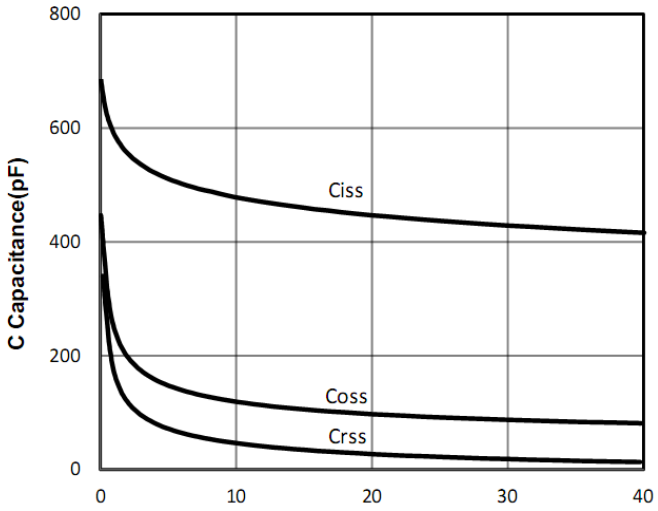


Figure5：V_{DS} Drain-Source Voltage（V）

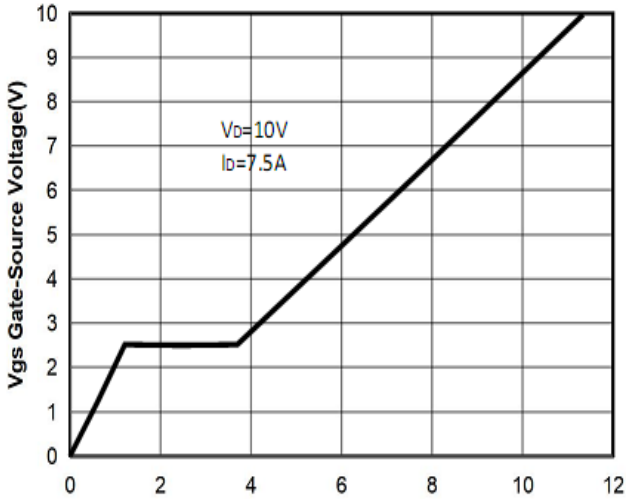


Figure6：Qg Gate Charge（nC）

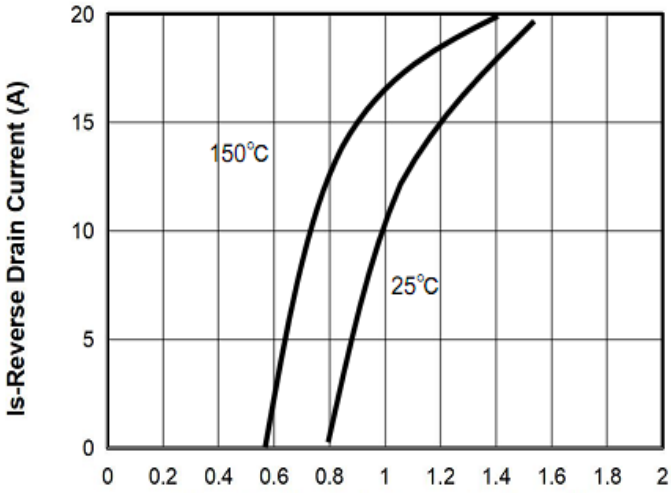


Figure7：Vsd Source-Drain Voltage（V）

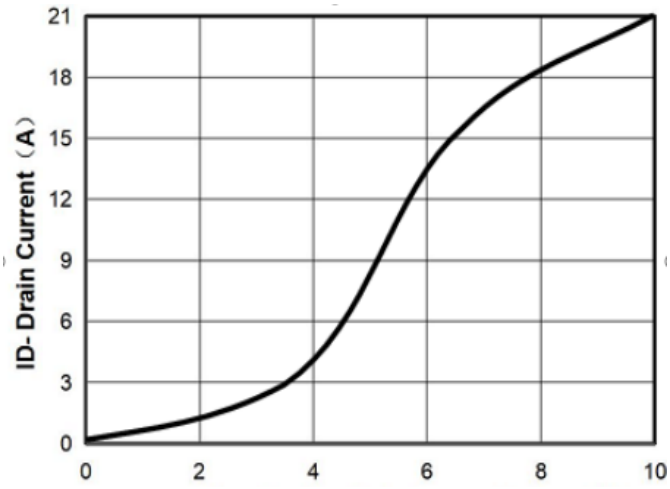


Figure8：Vgs Gate-Source Voltage（V）

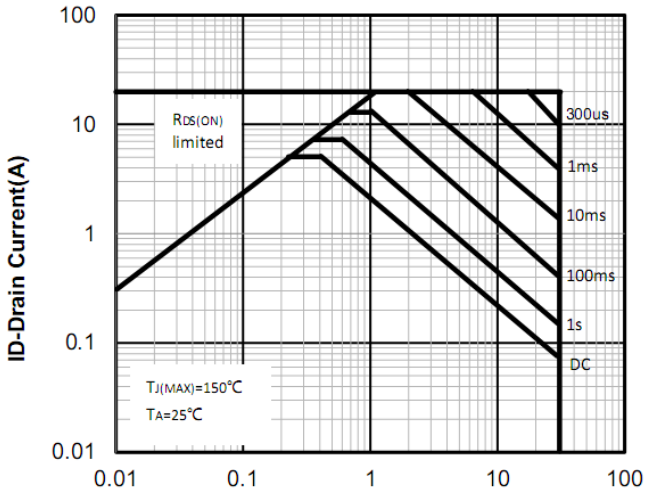


Figure9：Vds Drain -Source Voltage（V）

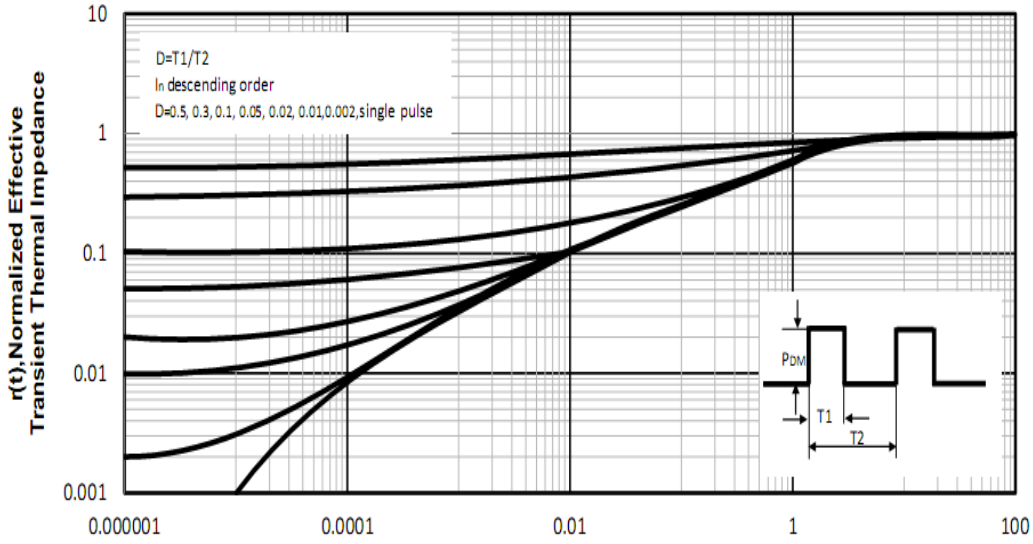


Figure10：Square Wave Pulse Duration（sec）

N+P-Channel Advanced Power MOSFET

Test Circuit and Waveform(N-Channel):

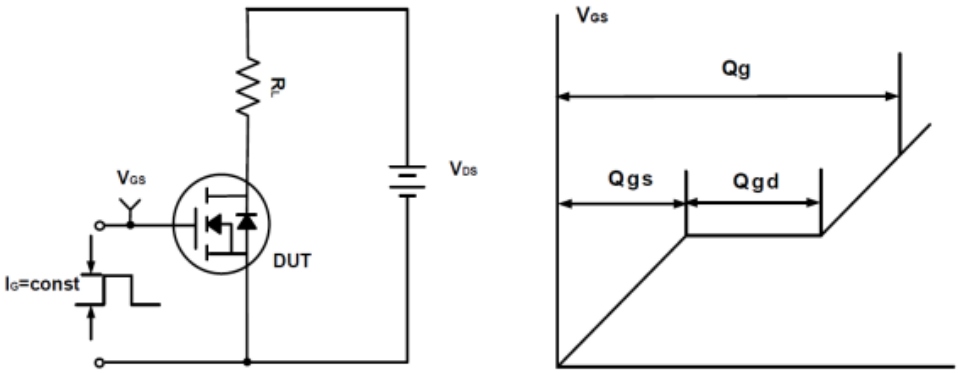


Figure A Gate Charge Test Circuit &Waveforms

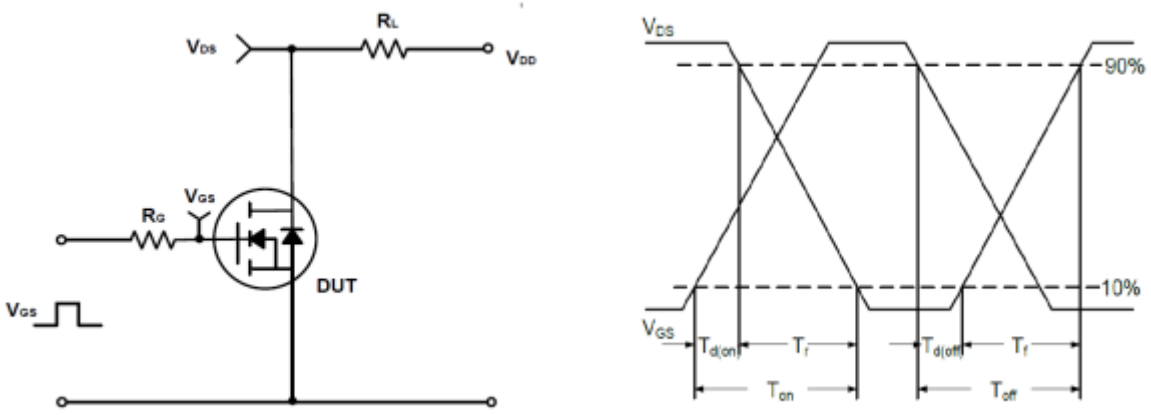


Figure B Switching Test Circuit & Waveforms

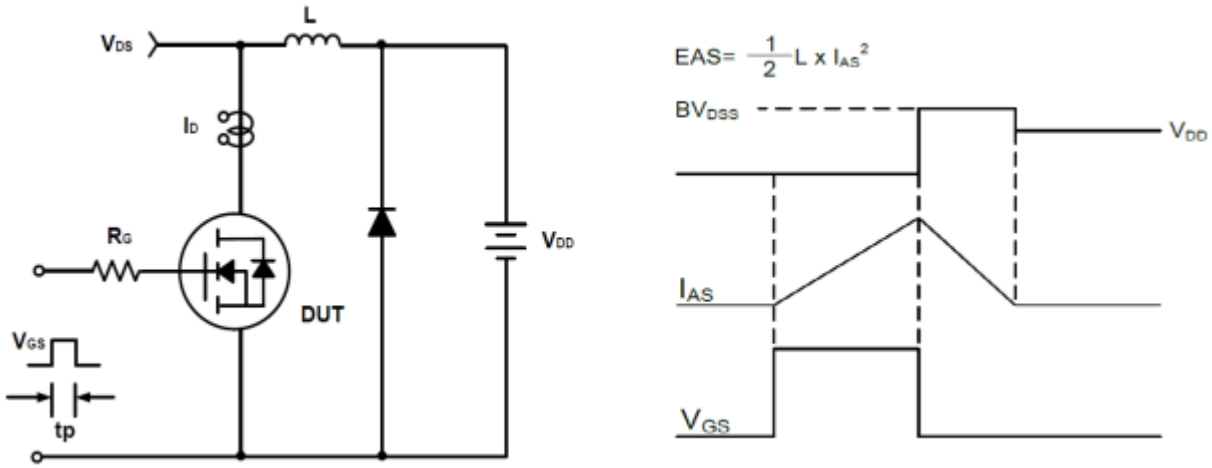


Figure C Unclamped Inductive Switching Circuit & Waveforms

Typical Characteristics(P-Channel)

N+P-Channel Advanced Power MOSFET

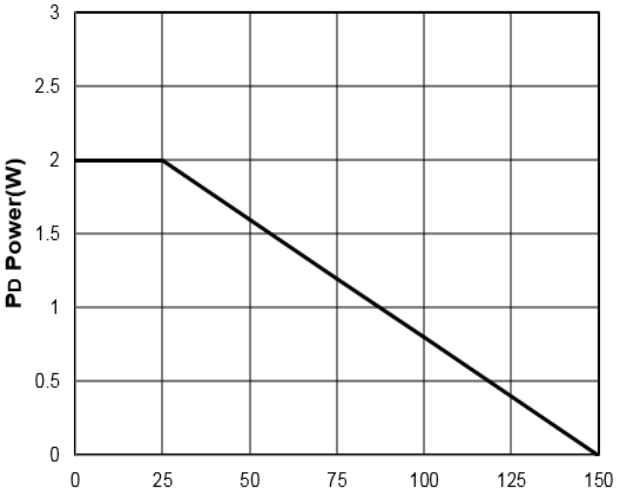


Figure11：TJ Junction Temperature（°C）

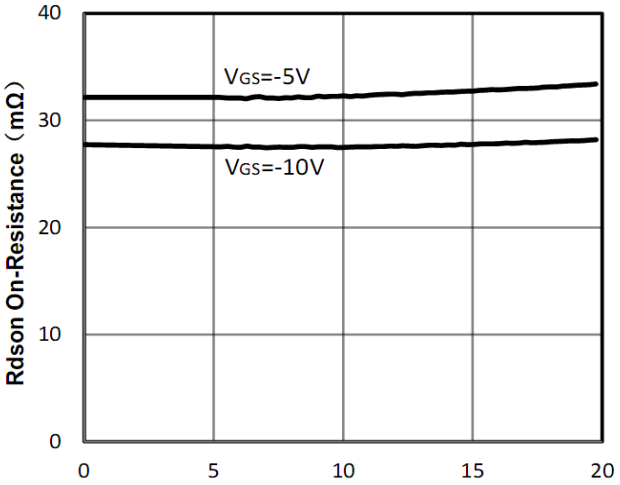


Figure12：-ID Drain Current（A）

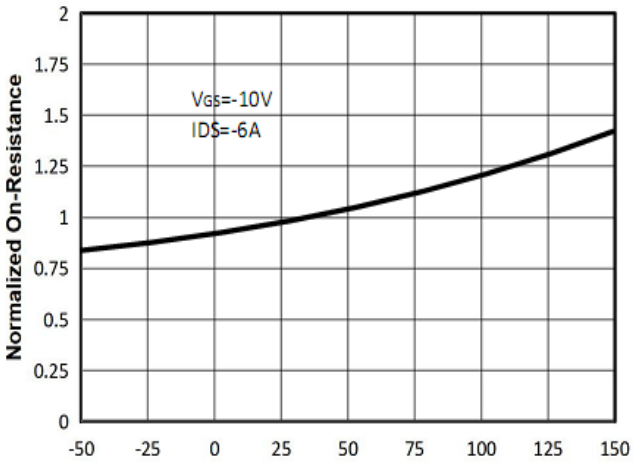


Figure13：TJ Junction Temperature（°C）

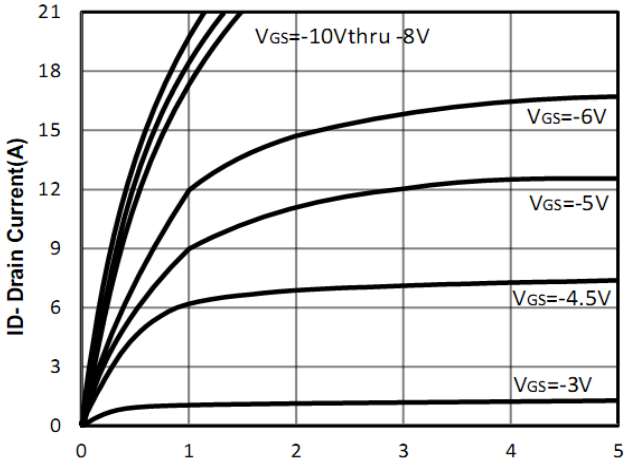


Figure14：-VDS Drain-Source Voltage（V）

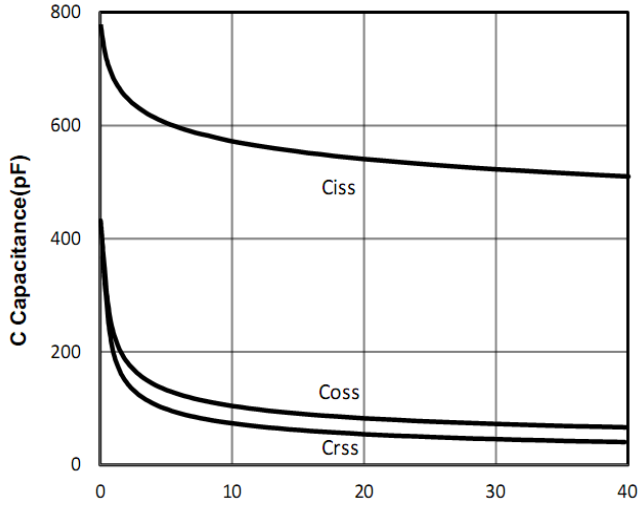


Figure15：-VDS Drain-Source Voltage（V）

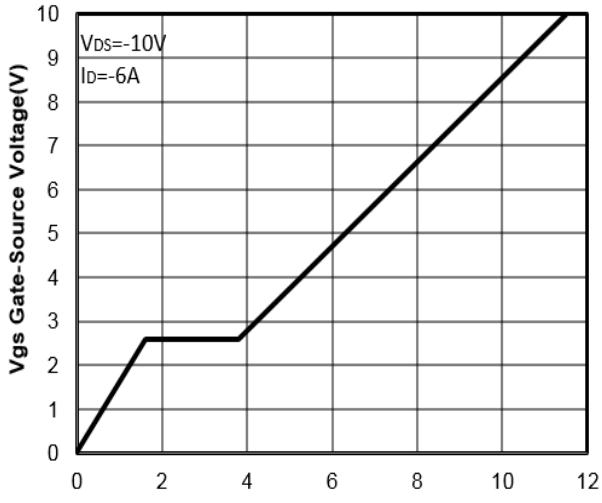


Figure16：Qg Gate Charge（nC）

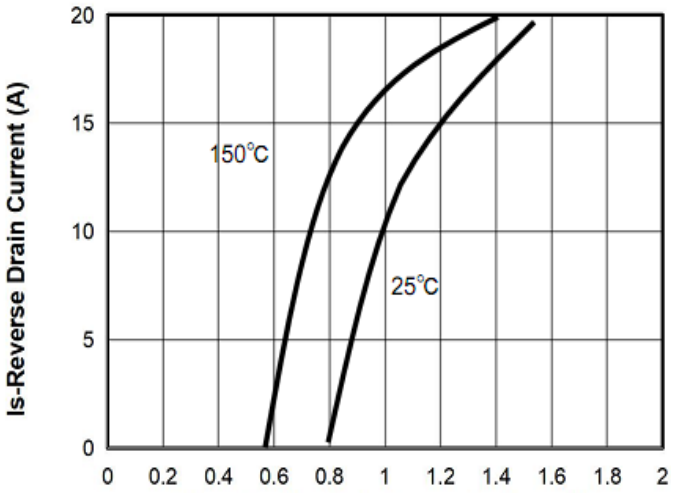


Figure17：Vsd Source-Drain Voltage（V）

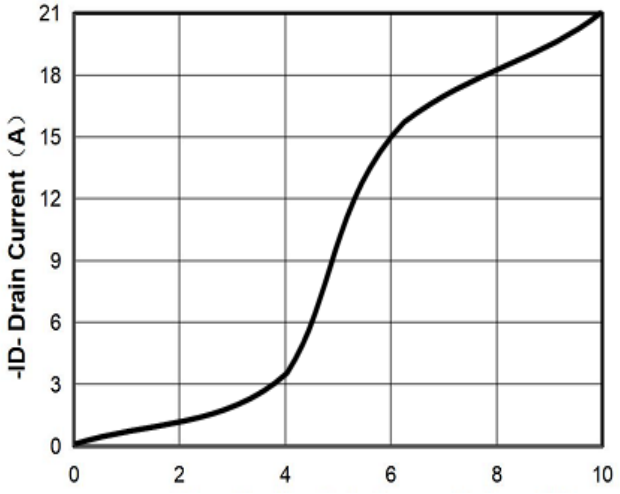


Figure18：-Vgs Gate-Source Voltage（V）

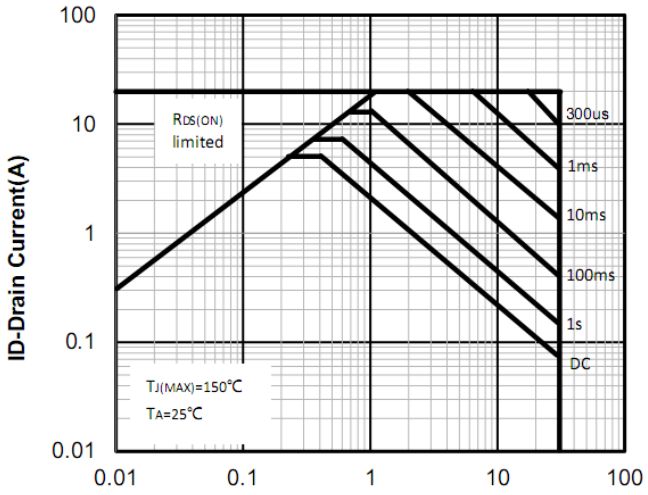


Figure19：Vds Drain -Source Voltage（V）

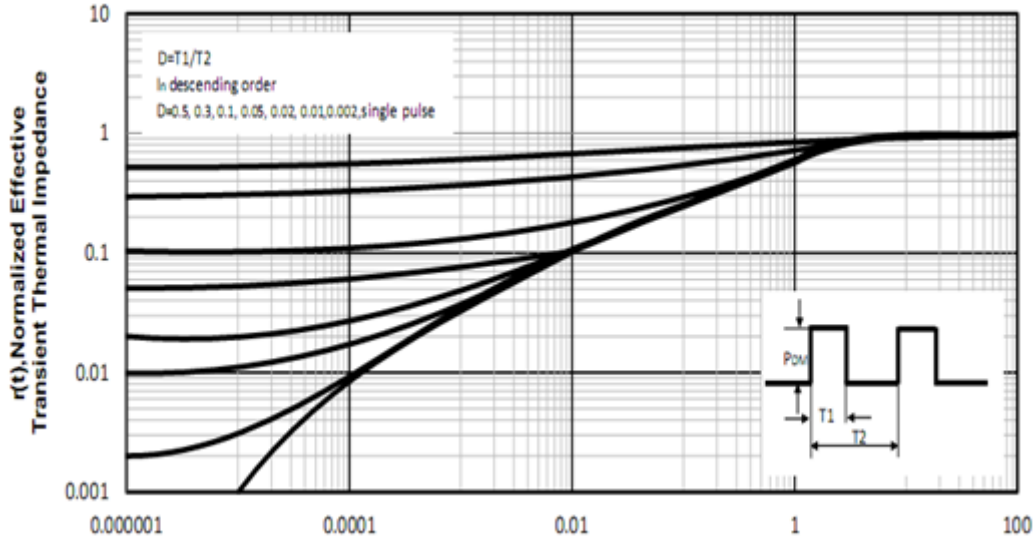


Figure20：Square Wave Pulse Duration（sec）

N+P-Channel Advanced Power MOSFET

Test Circuit and Waveform(P-Channel):

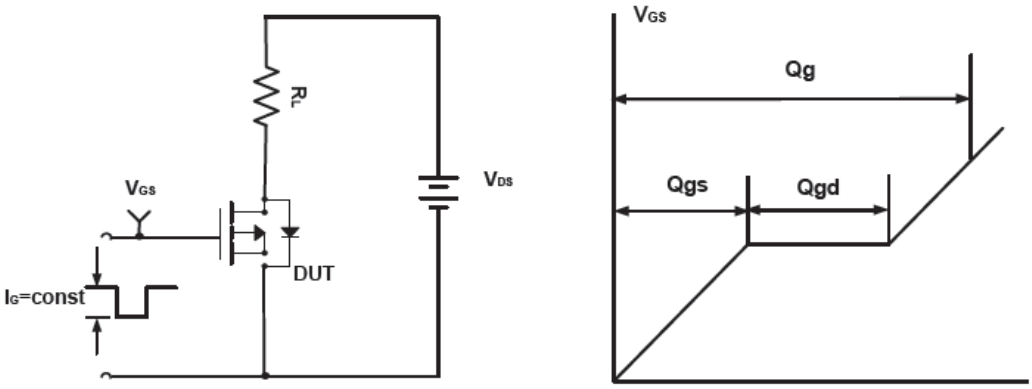
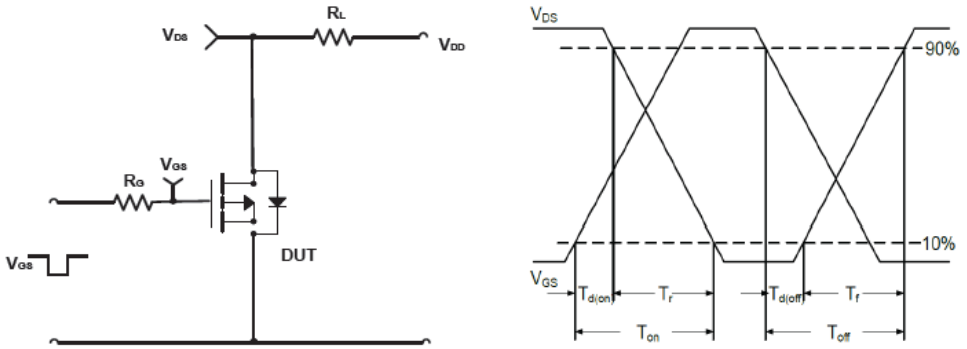


Figure D Gate Charge Test Circuit &Waveforms



FigureE Switching Test Circuit & Waveforms

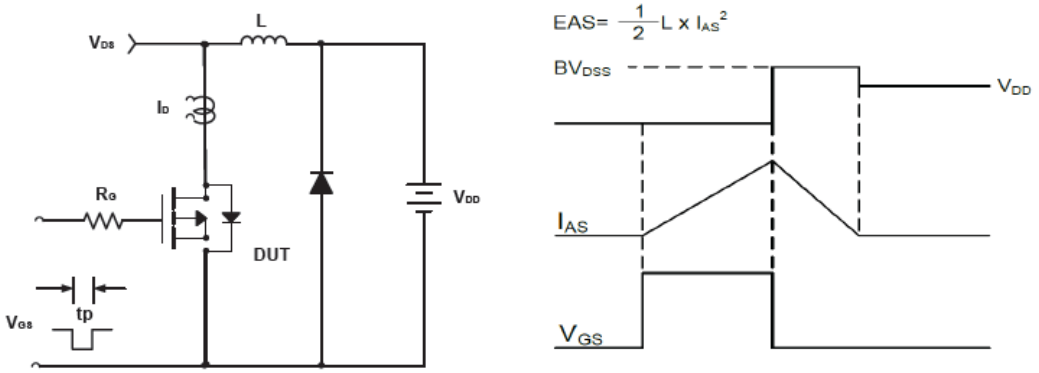
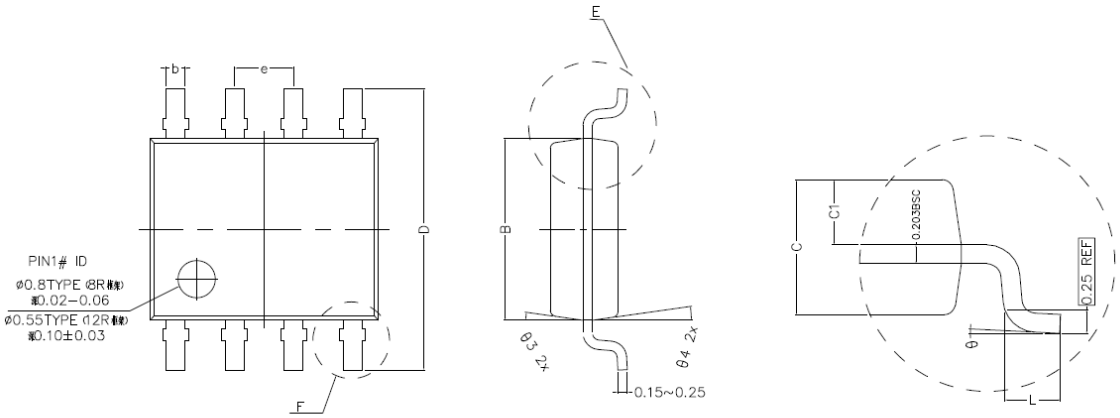
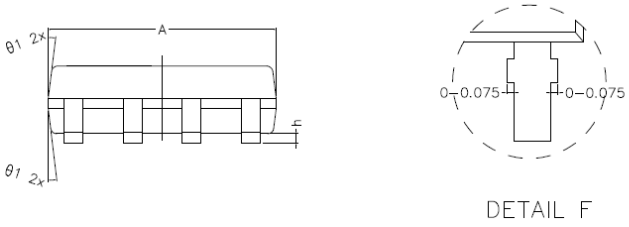


Figure F Unclamped Inductive Switching Circuit & Waveforms

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_1	7° TYPE(8R)	12° TYPE(12R)	
θ_2	7° TYPE(8R)	10° TYPE(12R)	
θ_3	8° TYPE(8R)	12° TYPE(12R)	
θ_4	8° TYPE(8R)	10° TYPE(12R)	
θ	0° ~ 8°		