PTS05C06

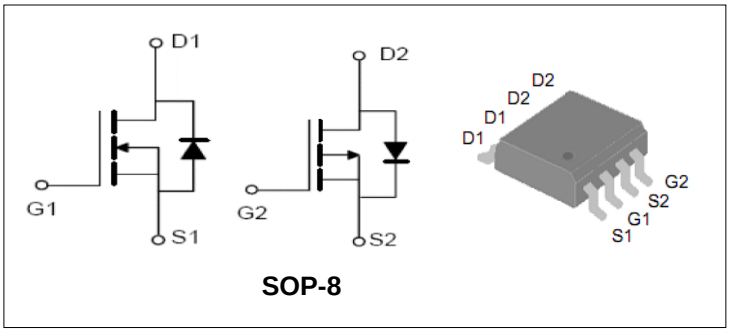
Complementary High Density Trench MOSFET

Features

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

Applications

- D C Fan
- Brushless motor
- Optimized for Power Management Applications for Portable Products, such as H-bridge, Inverters Car Charger and Others



SOP-8

N-Channel		
BVDSS	60	V
ID	6	A
RDSON@VGS=10V	29	mΩ
RDSON@VGS=4.5V	33	mΩ

P-Channel		
BVDSS	-60	V
ID	-5	A
RDSON@VGS=-10V	68	mΩ
RDSON@VGS=-4.5V	87	mΩ

Order Information

Product	Package	Marking	Reel Size	Reel	Carton
PTS05C06	SOP-8	PTS05C06	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		60	-60	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	6	-5	A
Mounted on Large Heat Sink					
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note1)	TA =25°C	24	-20	A
I_D	Continuous Drain current	TA =25°C	6	-6	A
P_D	Maximum Power Dissipation	TA =25°C	2		W
$R_{\theta JA}$	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
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=30V,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	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note3)	VGS=10V, ID=6A	--	29	35	mΩ
		VGS=4.5V, ID=5A	--	33	38	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	VDS= 30V, VGS=0V, F=1MHz	--	1310	--	pF
C_{oss}	Output Capacitance		--	59.4	--	pF
C_{rss}	Reverse Transfer Capacitance		--	44.3	--	pF
Q_g	Total Gate Charge	VDS= 30V, ID= 6A, VGS= 10V	--	31	--	nC
Q_{gs}	Gate-Source Charge		--	6	--	nC
Q_{gd}	Gate-Drain Charge		--	8	--	nC
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-on Delay Time	VDD=30V, ID=6A, VGEN=10V, RG=3Ω	--	6	--	nS
t_r	Turn-on Rise Time		--	11	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	19	--	nS
t_f	Turn-off Fall Time		--	5	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage (Note3)	IS=5A,VGS=0V	--	--	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	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=-60V,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	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note3)	VGS=-10V, ID=-5A	--	68	75	mΩ
		VGS=-4.5V, ID=-4A	--	88	95	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4)						
C_{iss}	Input Capacitance	VDS= -30V, VGS=0V, F=1MHz	--	1210	--	pF
C_{oss}	Output Capacitance		--	779	--	pF
C_{rss}	Reverse Transfer Capacitance		--	387	--	pF
Q_g	Total Gate Charge	VDS= -30V, ID= -5A, VGS= -10V	--	26	--	nC
Q_{gs}	Gate-Source Charge		--	5.1	--	nC
Q_{gd}	Gate-Drain Charge		--	7.9	--	nC
Switching Characteristics (Note4)						
$t_{d(on)}$	Turn-on Delay Time	VDD=- 30V, ID=-5A, VGEN=-10V, RG=3Ω	--	8	--	nS
t_r	Turn-on Rise Time		--	10.1	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	59	--	nS
t_f	Turn-off Fall Time		--	27	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage (Note3)	IS=-5A,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.

Complementary High Density Trench MOSFET

Typical Characteristics(N-Channel)

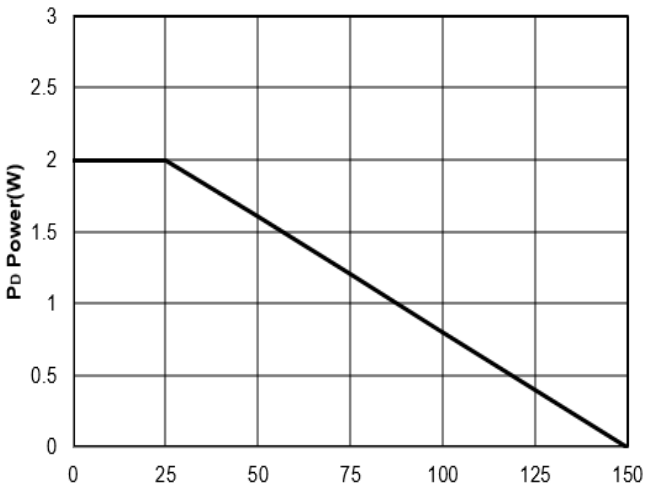


Figure1：T_J Junction Temperature（°C）

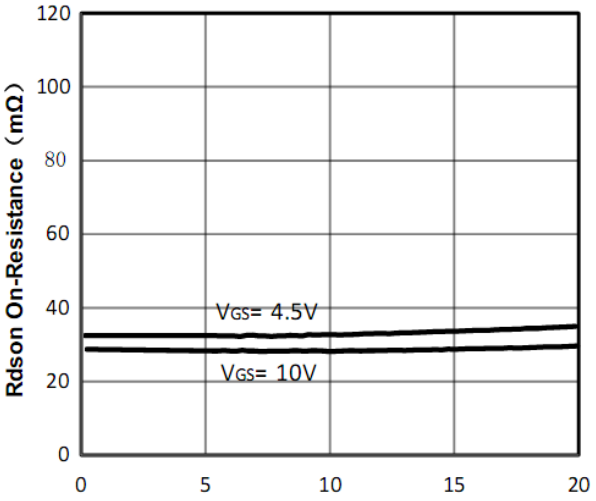


Figure2：I_D Drain Current（A）

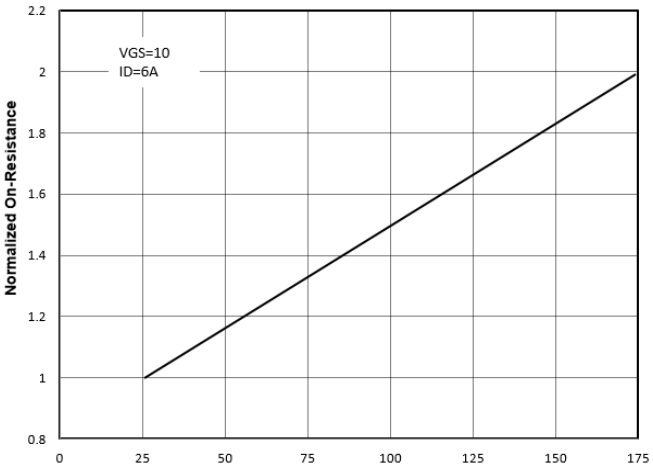


Figure3：T_J Junction Temperature（°C）

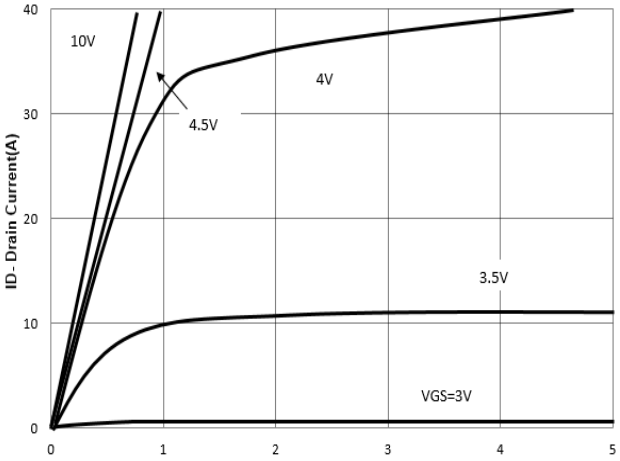


Figure4：V_{DS} Drain-Source Voltage（V）

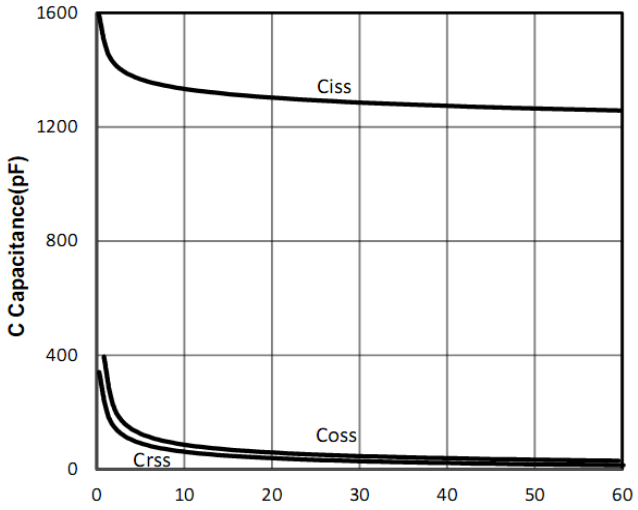


Figure5：V_{DS} Drain-Source Voltage（V）

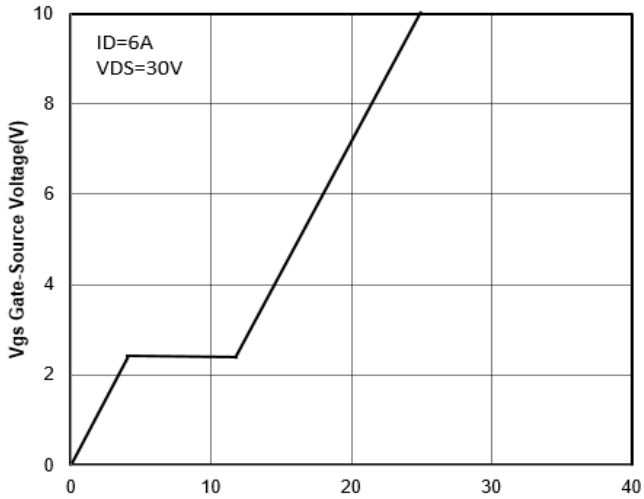


Figure6：Qg Gate Charge（nC）

Complementary High Density Trench MOSFET

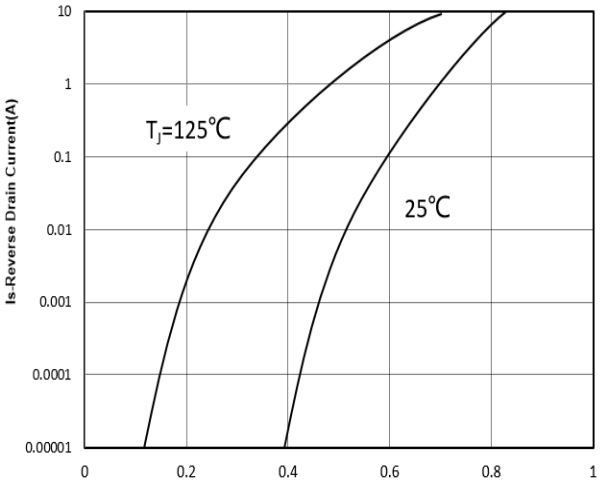


Figure7：Vsd Source-Drain Voltage（V）

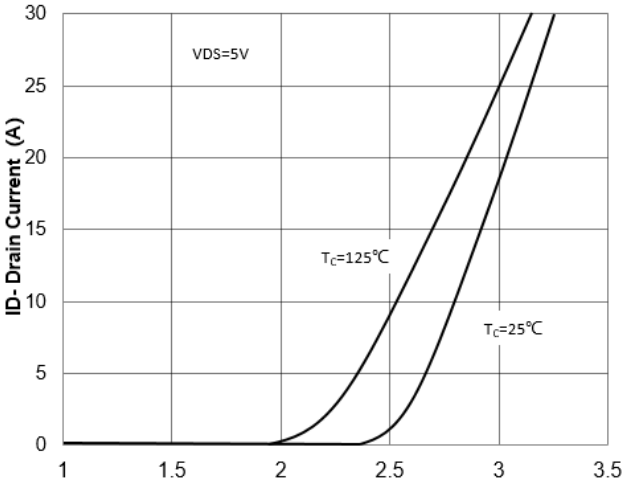


Figure8：Vgs Gate-Source Voltage（V）

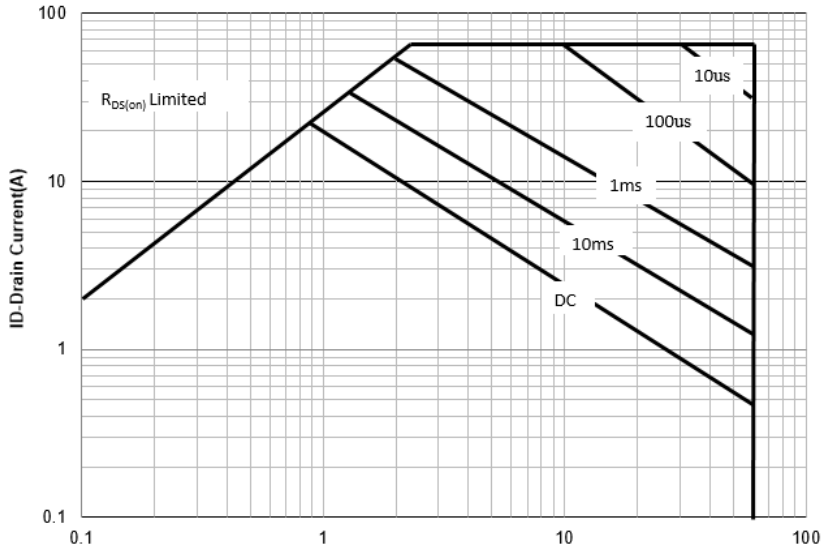


Figure9：Vsd Drain -Source Voltage（V）

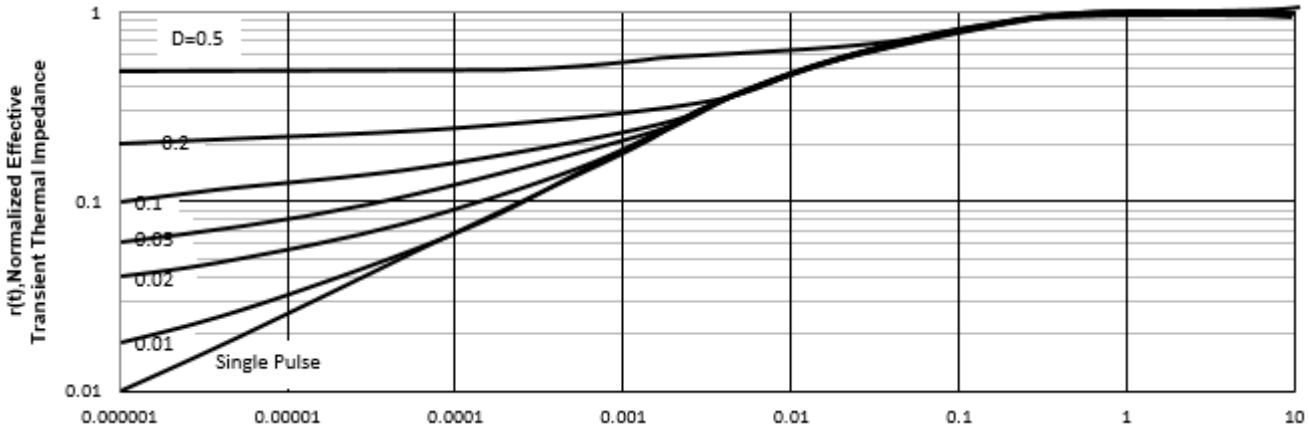


Figure10：Square Wave Pulse Duration（sec）

Complementary High Density Trench MOSFET

Test Circuit and Waveform(P-Channel):

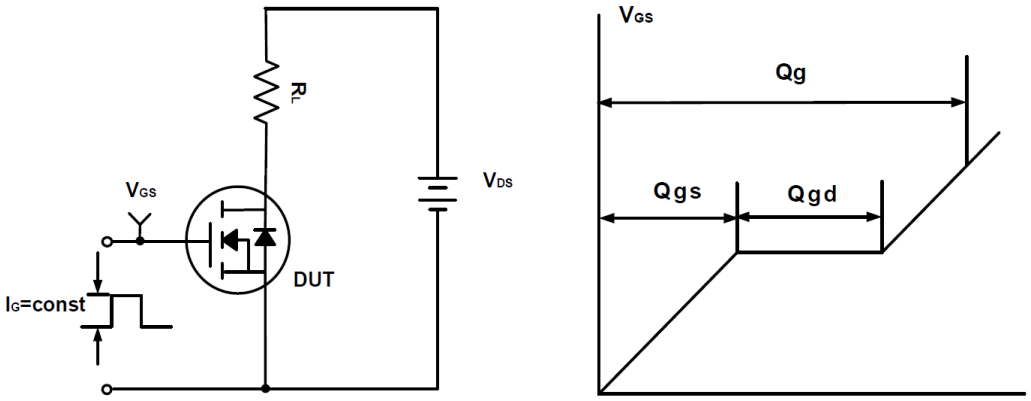


Figure A Gate Charge Test Circuit &Waveforms

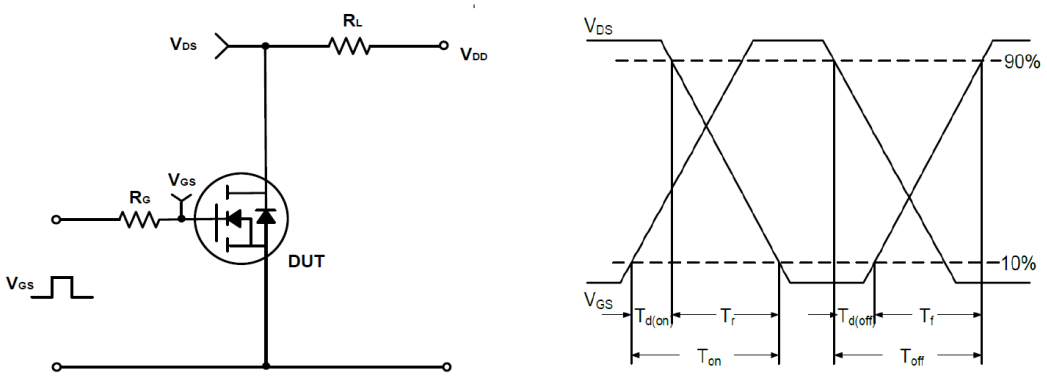


Figure B Switching Test Circuit & Waveforms

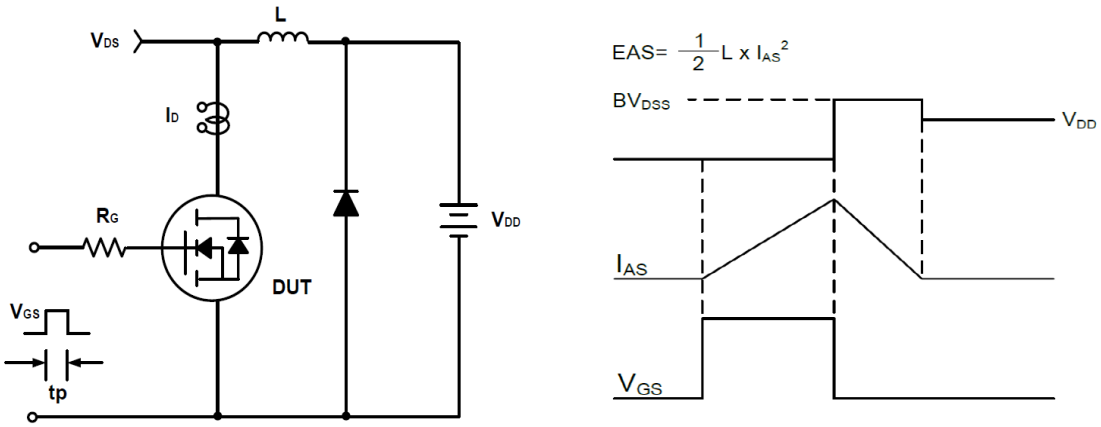


Figure C Unclamped Inductive Switching Circuit & Waveforms

Complementary High Density Trench MOSFET

Typical Characteristics(P-Channel)

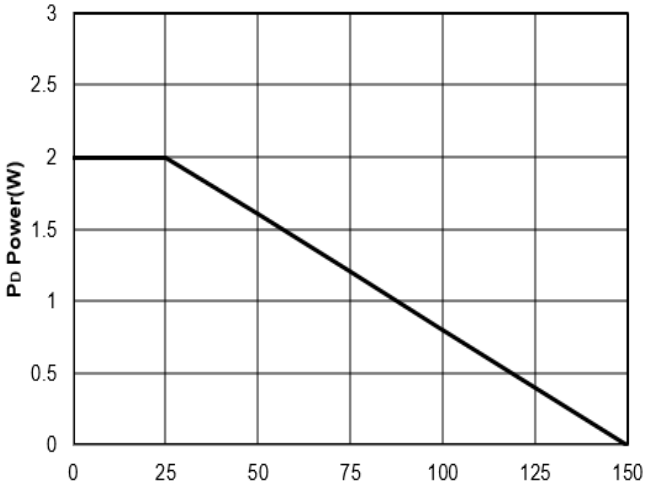


Figure1：TJ Junction Temperature（°C）

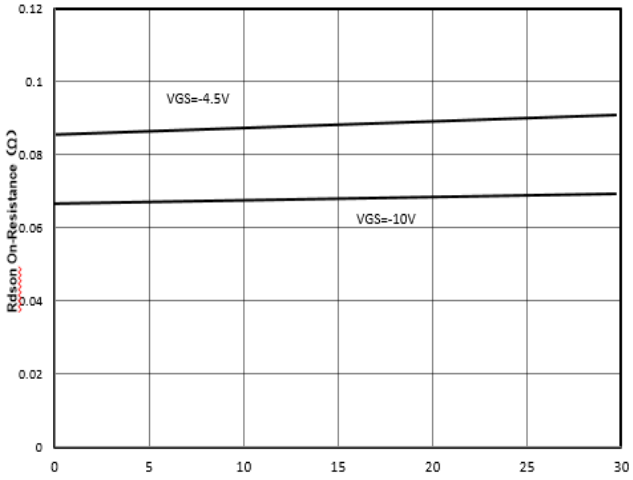


Figure2：-ID Drain Current（A）

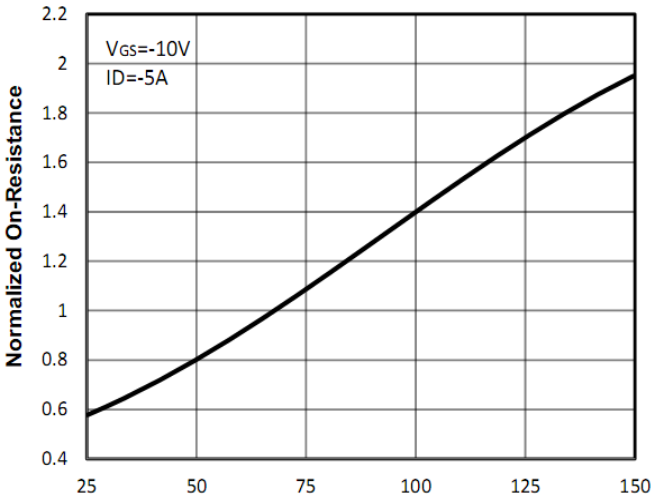


Figure3：TJ Junction Temperature（°C）

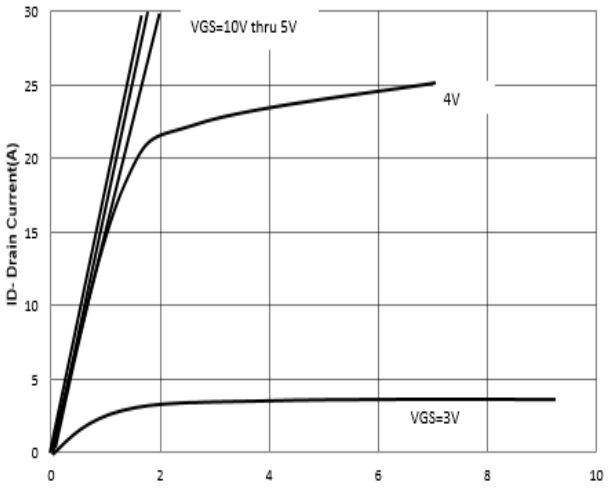


Figure4：-VDS Drain-Source Voltage（V）

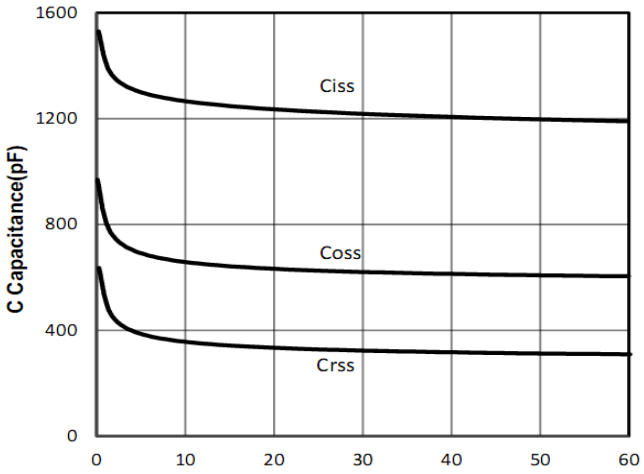


Figure5：-VDS Drain-Source Voltage（V）

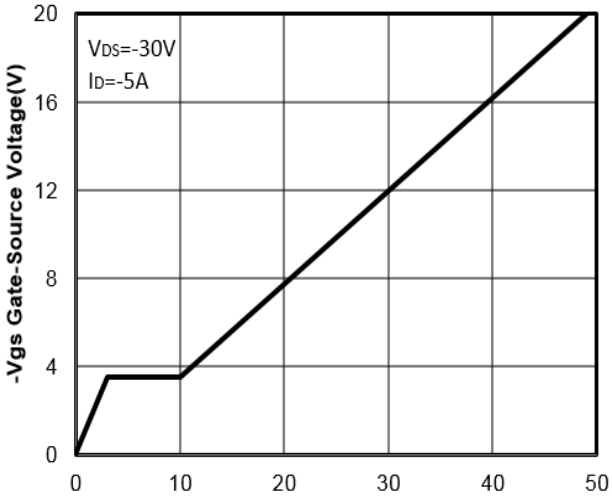


Figure6：Qg Gate Charge（nC）

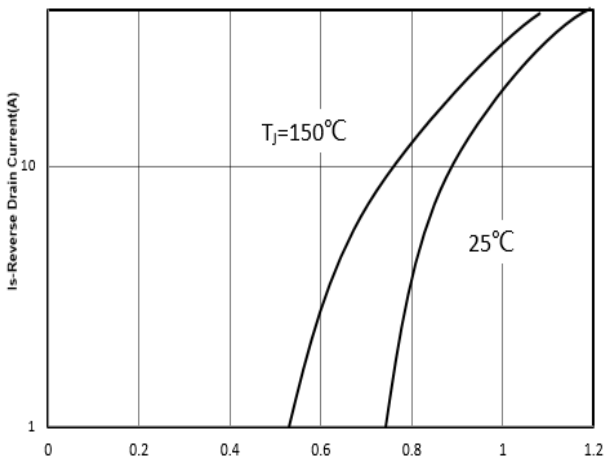


Figure7：-Vsd Source-Drain Voltage（V）

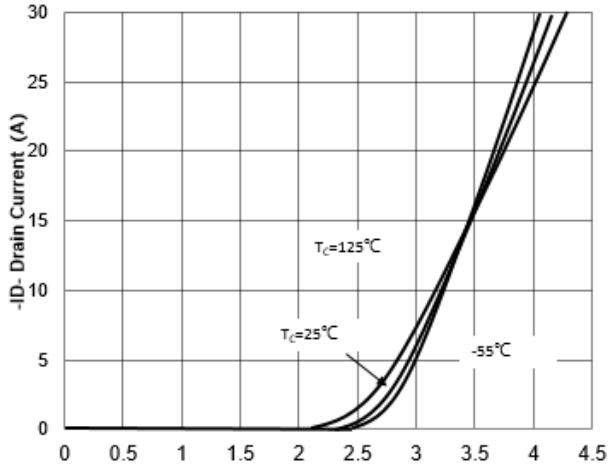


Figure8：-Vgs Gate-Source Voltage（V）

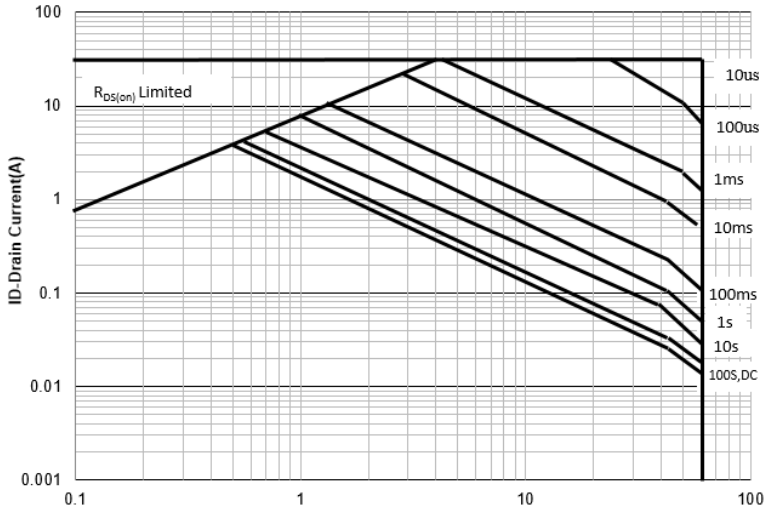


Figure9：-Vds Drain -Source Voltage（V）

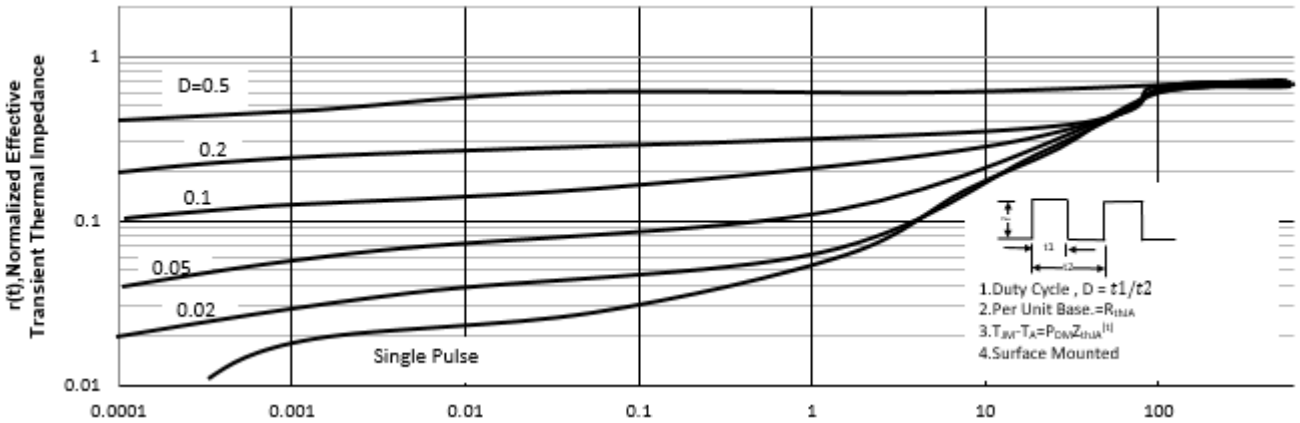


Figure10：Square Wave Pulse Duration（sec）

Test Circuit and Waveform(P-Channel):

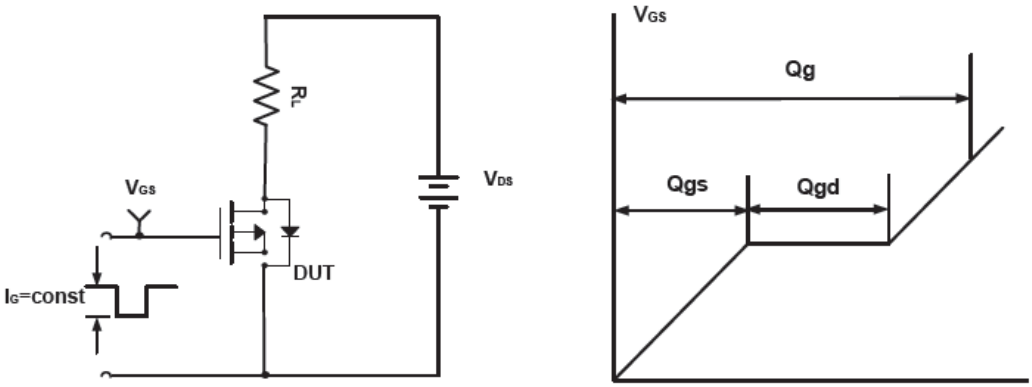
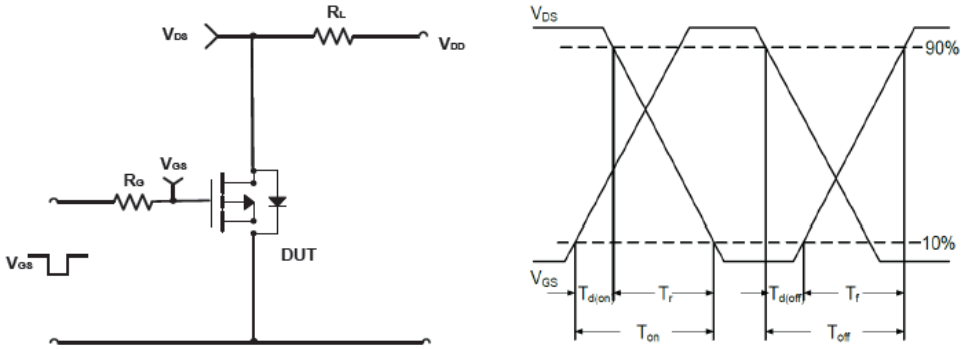


Figure D Gate Charge Test Circuit &Waveforms



FigureE Switching Test Circuit & Waveforms

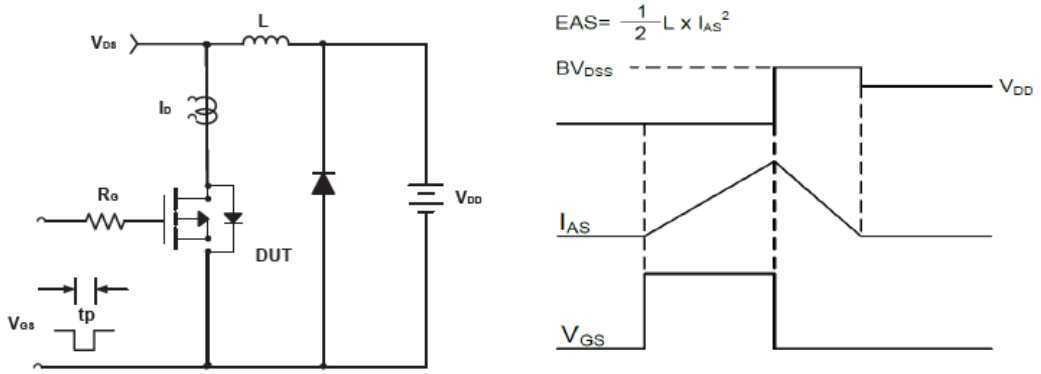


Figure F Unclamped Inductive Switching Circuit & Waveforms

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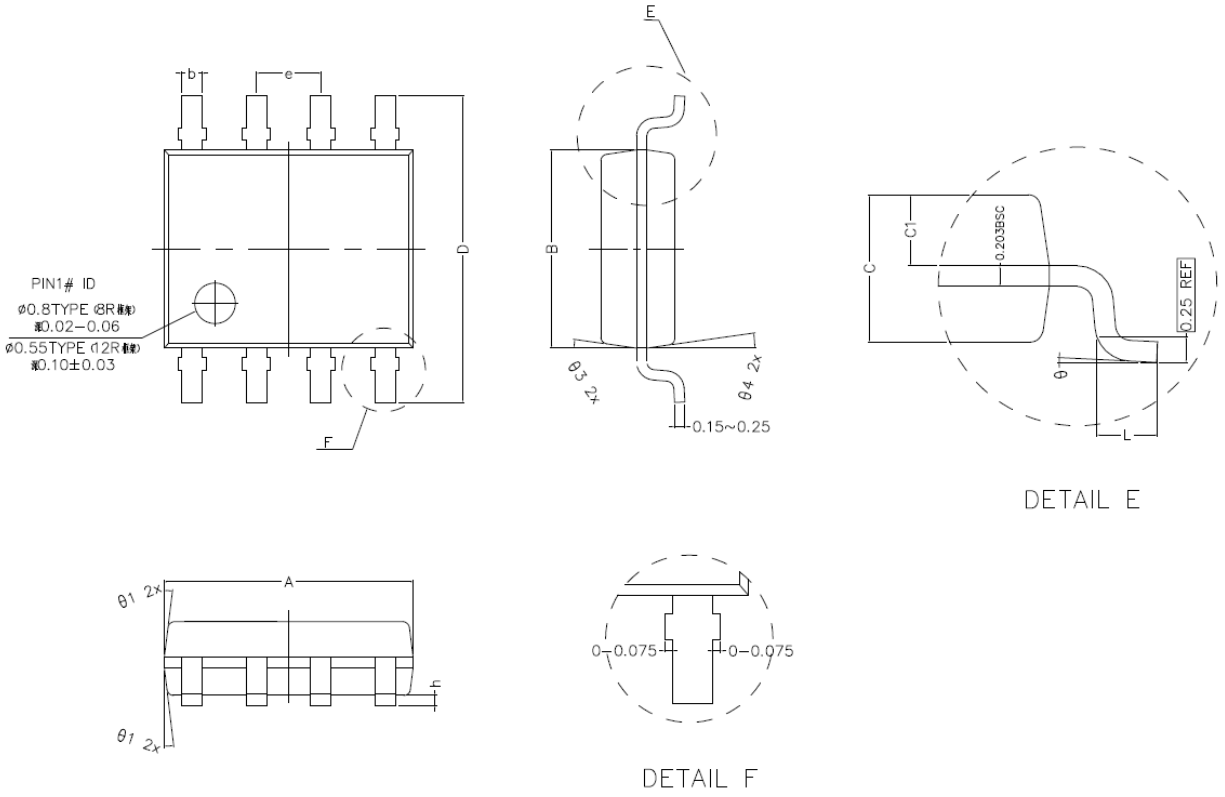
SOP-8 Package Outline Dimensions (Units: mm)



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°		