

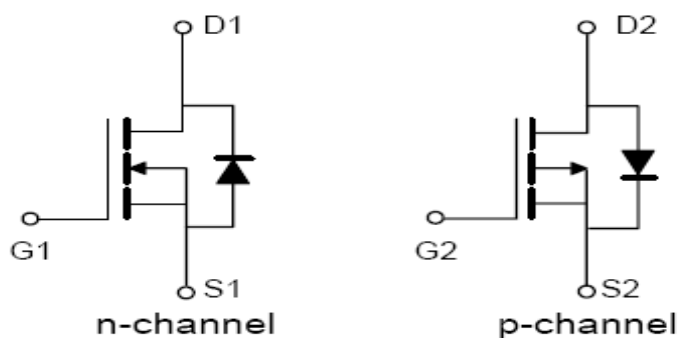
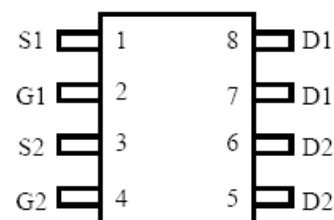


Complementary High Density Trench MOSFET

Order Information

Product	Package	Marking	Packing
PT4606	SOP-8	PT4606	3000PCS/Reel

SOP-8



PRODUCT SUMMARY (N-Channel)		
V_{DS}	I_D	$R_{DS(on)}$ (m-ohm) Max
30V	5.8A	31 @ $V_{GS} = 10V, I_D = 5.8A$
		43 @ $V_{GS} = 4.5V, I_D = 5.0A$

PRODUCT SUMMARY (P-Channel)		
V_{DS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-30V	-6.5A	46 @ $V_{GS} = -10V, I_D = -6.5A$
		72 @ $V_{GS} = -4.5V, I_D = -5.0A$

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Drain Current ^a	5.8	-6.5	A
I_{DM}	Drain Current ^b (Pulsed) ^{*1}	20	-30	A
I_S	Drain-Source Diode Forward Current ^a	5	-6.5	A
P_D	Total Power Dissipation ^a @ $T_A = 25^\circ\text{C}$	2.0	2.0	W
	Total Power Dissipation ^a @ $T_A = 75^\circ\text{C}$	1.2	1.2	
T_j, T_{stg}	Operating Junction and Storage Temperature Range ^a	-55 to +150	-55 to +150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient ^a	63.2	63.2	$^\circ\text{C/W}$

a: Surface Mounted on FR4 Board, $t \leq 5\text{sec}$.

b: Pulse width limited by maximum junction temperature.



Complementary High Density Trench MOSFET

N-Channel Electrical Characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics ^c						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	1.9	3	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D = 5.8A	-	24	31	mΩ
		V _{GS} =4.5V, I _D = 5.0A	-	36	43	
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D = 5.0A	-	6.0	-	S
• Dynamic Characteristics ^d						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	-	398	-	pF
C _{oss}	Output Capacitance		-	67	-	
C _{rss}	Reverse Transfer Capacitance		-	61	-	
• Switching Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =10V, I _D =1A, V _{GS} =10V	-	7.4	-	nC
Q _{gs}	Gate-Source Charge		-	1.7	-	
Q _{gd}	Gate-Drain Charge		-	1.3	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} = 15V, R _L =15Ω, I _D =1A, V _{GEN} =10V, R _G =6Ω	-	8.0	-	nS
t _r	Turn-on Rise Time		-	11.2	-	
t _{d(off)}	Turn-off Delay Time		-	17.2	-	
t _f	Turn-off Fall Time		-	7.54	-	
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =2.3A	-	-	1.2	V

Note:

b: Pulse width limited by maximum junction temperature.

c: Guaranteed by design, not subject to production testing.



Complementary High Density Trench MOSFET

P-Channel Electrical Characteristics ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} -30V, V _{GS}			-1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
• On Characteristics ^c						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1.4	-1.9	-2.4	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-6.5A	-	30	46	mΩ
		V _{GS} =-4.5V, I _D =-5A	-	53	72	
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-6.0A	-	12.7	-	S
• Dynamic Characteristics ^d						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	-	930	-	pF
C _{oss}	Output Capacitance		-	121	-	
C _{rss}	Reverse Transfer Capacitance		-	102	-	
• Switching Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =-15V, I _D =-3A, V _{GS} =-10V	-	20	-	nC
Q _{gs}	Gate-Source Charge		-	4.1	-	
Q _{gd}	Gate-Drain Charge		-	2.6	-	
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, R _L =5Ω, I _D =-3A, V _{GEN} =-10V, R _G =6Ω	-	9.5	-	nS
t _r	Turn-on Rise Time		-	5.4	-	
t _{d(off)}	Turn-off Delay Time		-	42.5	-	
t _f	Turn-off Fall Time		-	13.6	-	
• Drain-Source Diode Characteristics						
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =-1A	-	-	-1.0	V

Note:

b: Pulse width limited by maximum junction temperature.

c: Guaranteed by design, not subject to production testing.



Complementary High Density Trench MOSFET Characteristics Curve(N-Channel)

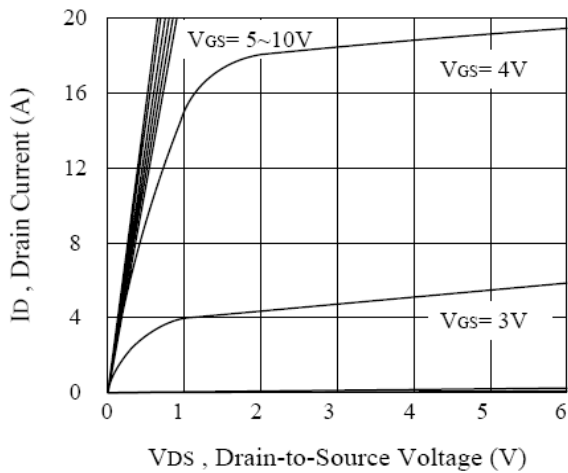


Figure 1. Output Characteristics

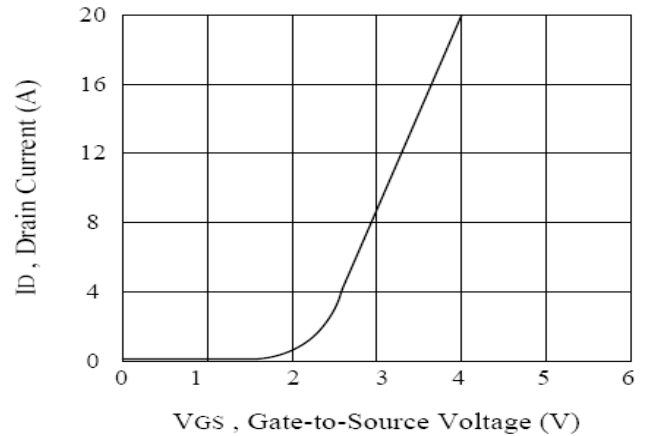


Figure 2. Transfer Characteristics

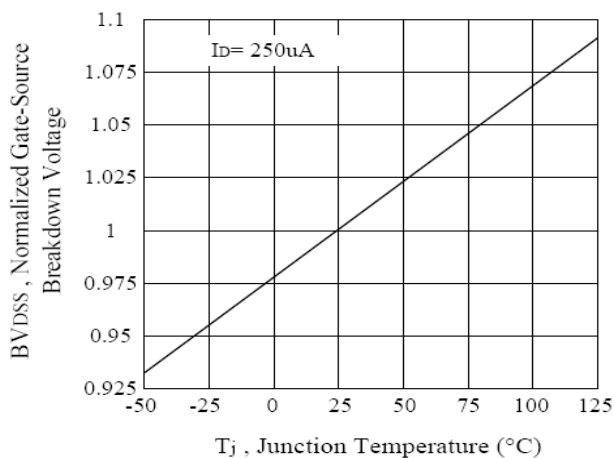


Figure 3. Breakdown Voltage Variation with Temperature

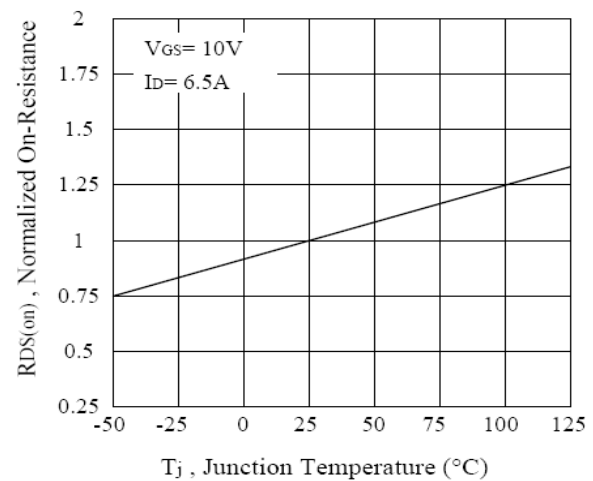


Figure 4. On-Resistance Variation with Temperature

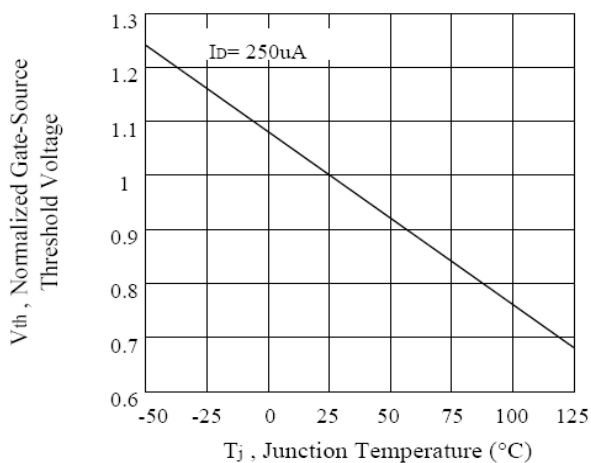
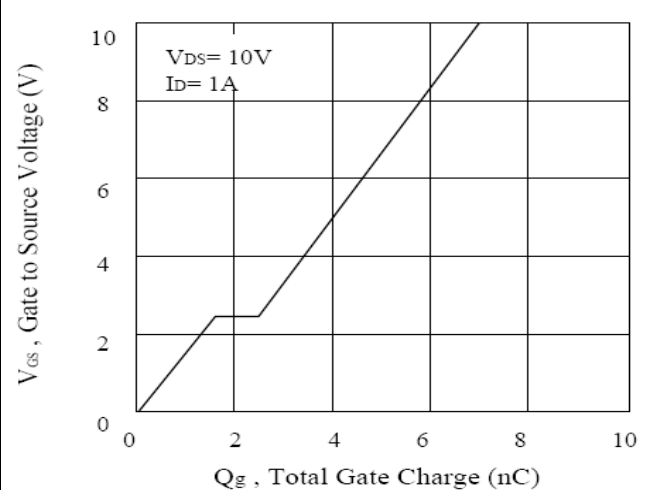


Figure 5. Gate Threshold Variation with Temperature



Complementary High Density Trench MOSFET

Characteristics Curve(N-Channel)

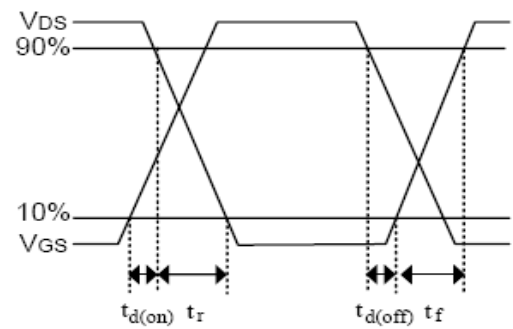
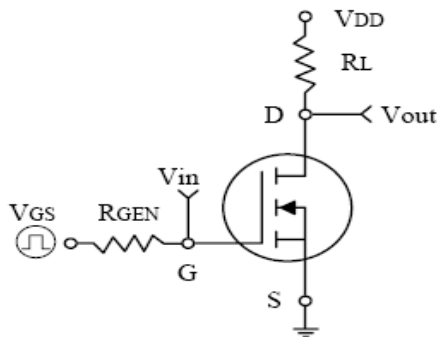
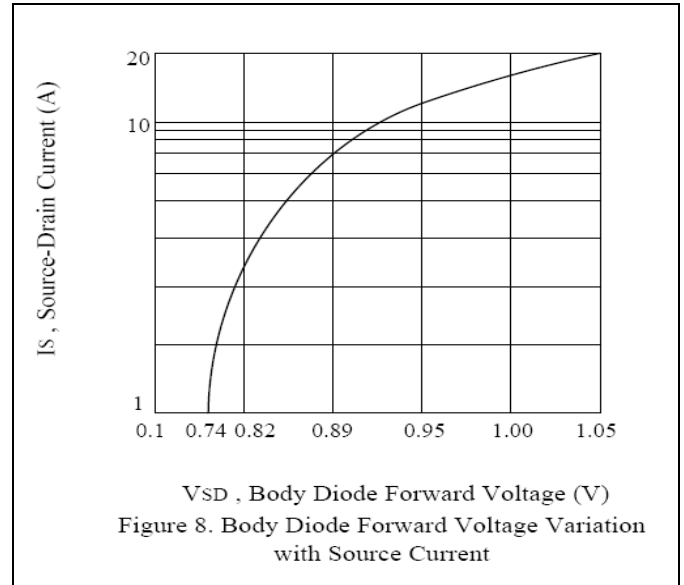
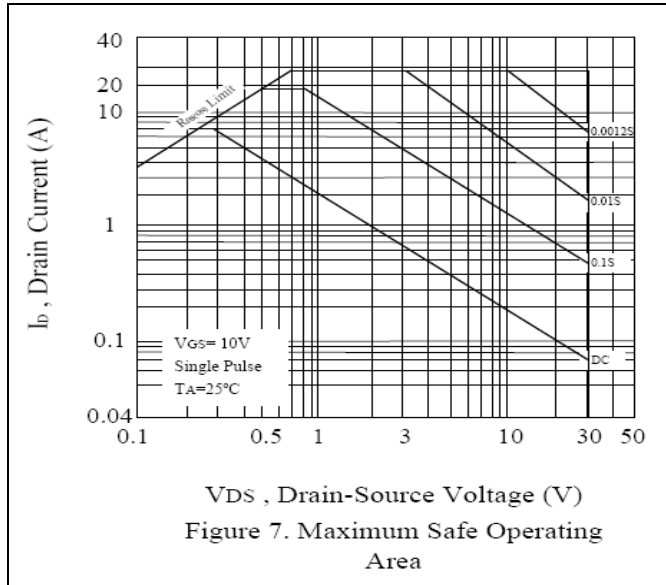


Figure 9. Switching Test Circuit and Switching Waveforms



Complementary High Density Trench MOSFET Characteristics Curve(P-Channel)

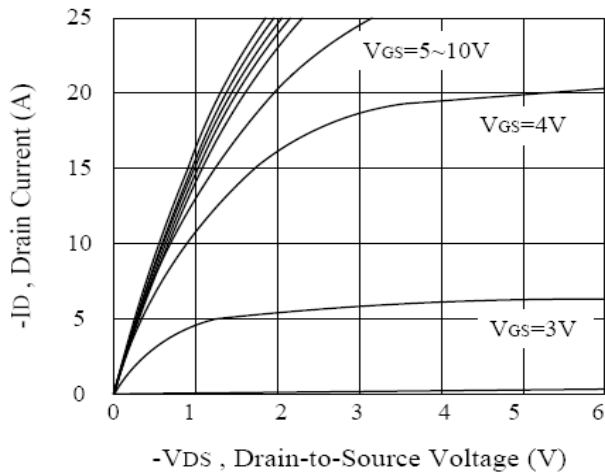


Figure 10 Output Characteristics

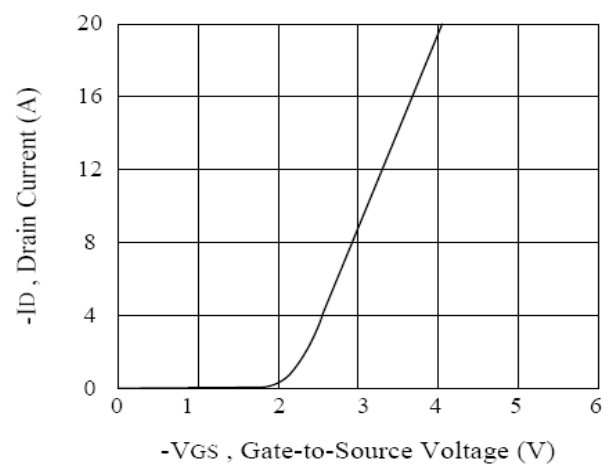


Figure 11 Transfer Characteristics

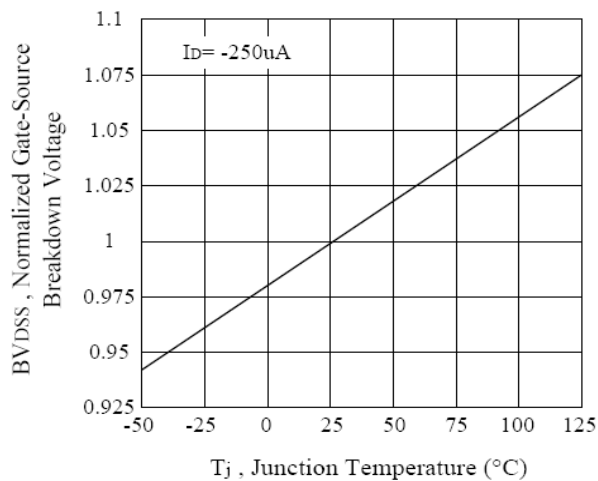


Figure 12 Breakdown Voltage Variation with

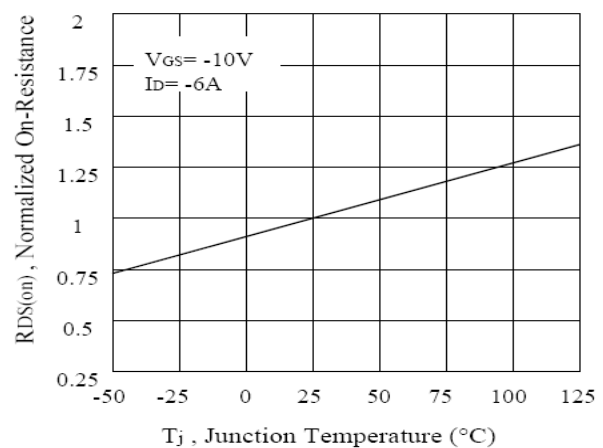


Figure 13. On-Resistance Variation with Temperature

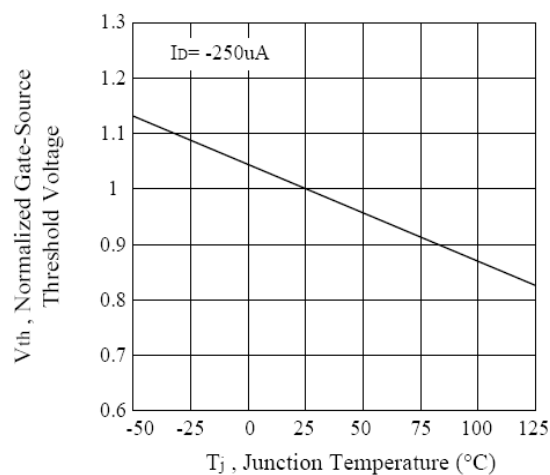


Figure 14 Gate Threshold Variation with Temperature

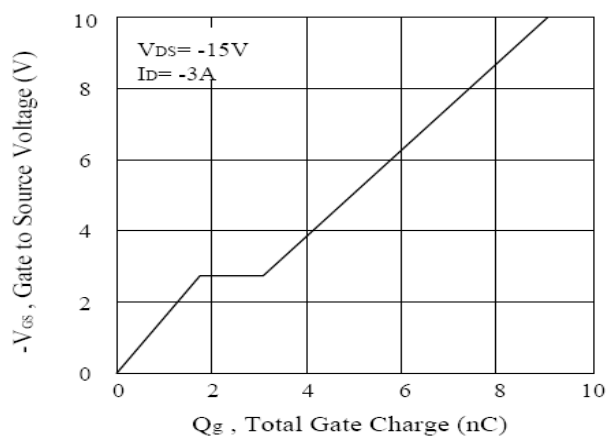


Figure 15. Gate Charge

Complementary High Density Trench MOSFET

Characteristics Curve(P-Channel)

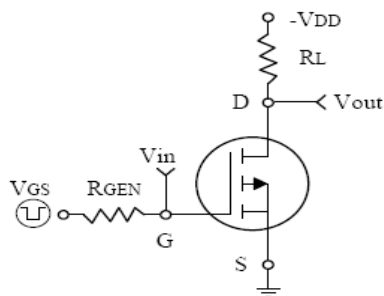
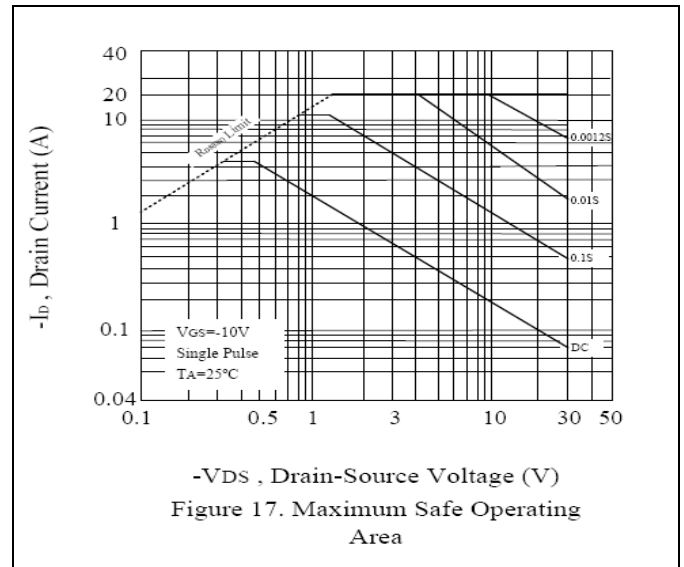
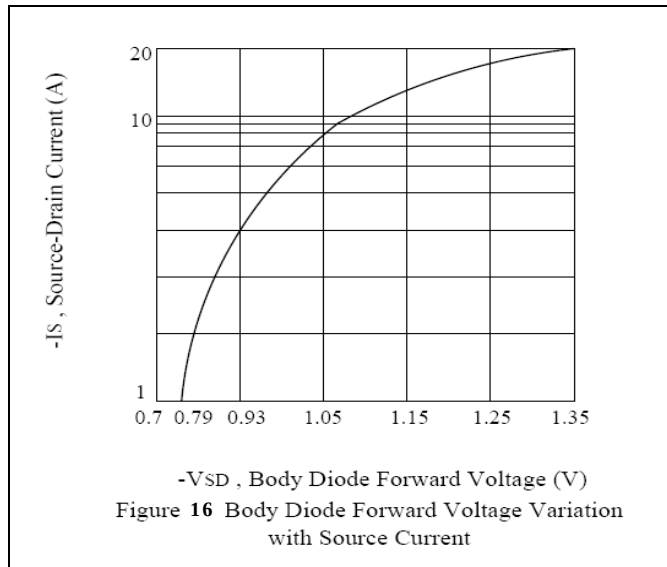
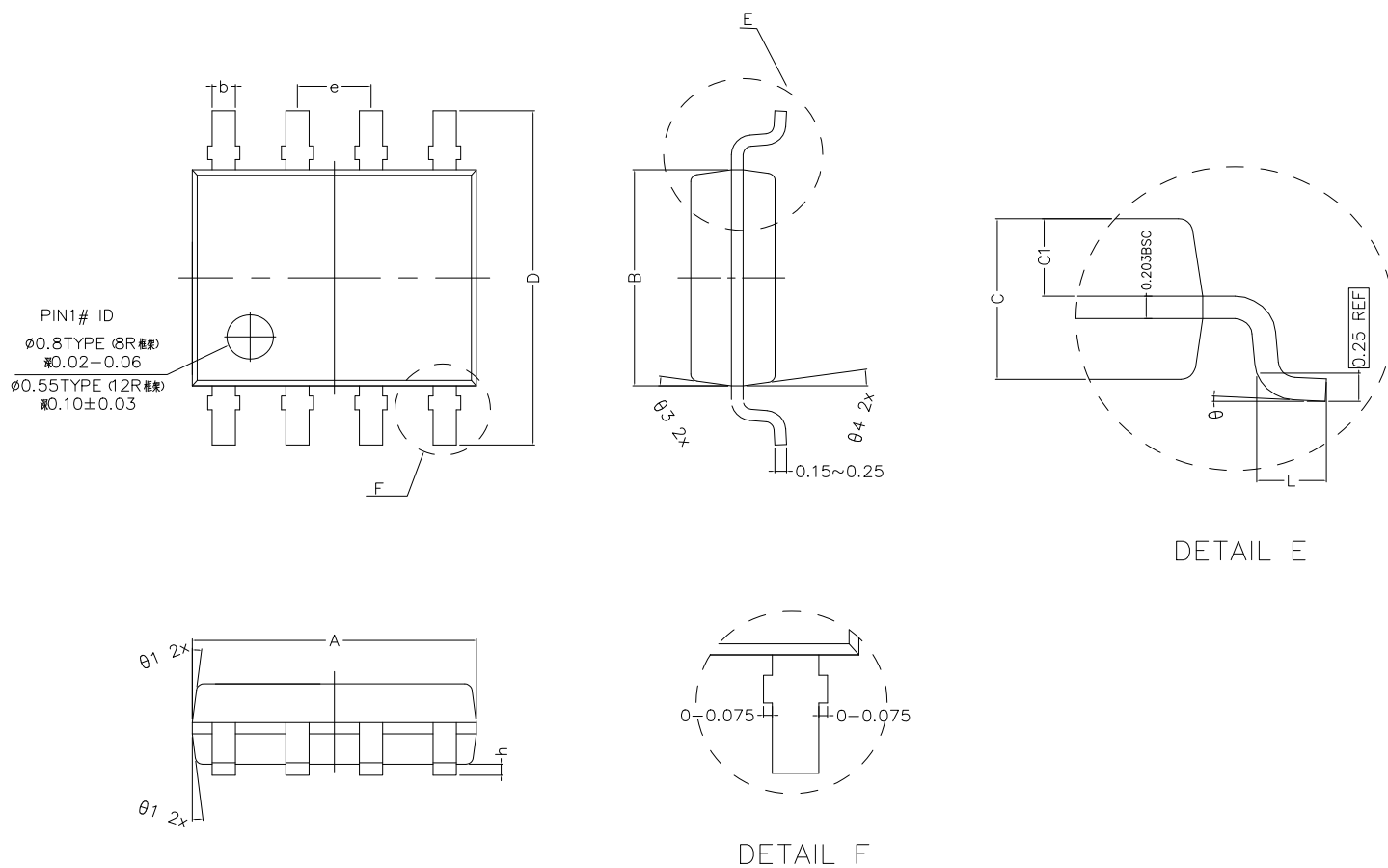


Figure 18 Switching Test Circuit and Switching Waveforms



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°		