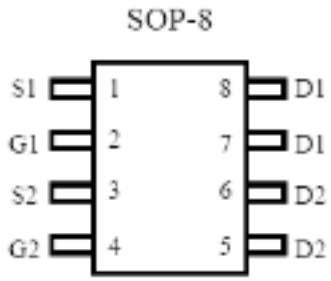
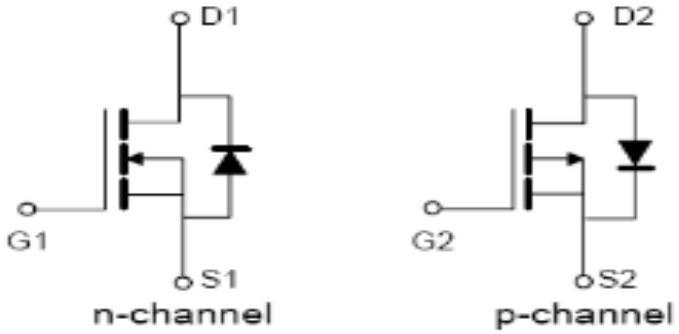
Complementary High Density Trench MOSFET



Order Information

Product	Package	Marking	Packing
PT4606A	SOP-8	PT4606	3000PCS/Reel



PRODUCT SUMMARY (N-Channel)		
V_{DSS}	I_D	$R_{DS(on)}$ (m- ohm) Max
30V	5.8A	22@ VGS = 10 V, I_D=5.8A
		25@ VGS = 4.5V,I_D=5.0A

PRODUCT SUMMARY (P-Channel)		
V_{DSS}	I_D	$R_{DS(on)}$ (m- ohm) Max
-30V	-6.5A	34 @ VGS = -10V,I_D=- 6.5A
		56 @ VGS = -4.5V,I_D=- 5.0A

Absolute Maximum Ratings (T_A=25°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
Is	Drain-Source Diode Forward Current [a]	5	-6.5	A
P_D	Total Power Dissipation[a] @T_A=25°C	2.0	2.0	W
	Total Power Dissipation[a] @T_A=75°C	1.2	1.2	
T_j, T_{stg}	Operating Junction and Storage Temperature Range[a]	-55 to +150	-55 to +150	°C
$R_{\theta JA}$	Thermal Resistance Junction to Ambient[a]	63.2	63.2	°C/W

a: Surface Mounted on FR4 Board , t ≤ 5sec .
b: Pulse width limited by maximum junction temperature.

N-Channel Electrical Characteristics(T_A=25°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	1.5	3	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D= 5.8A	-	16	22	mΩ
		V_{GS}=4.5V, I_D= 5.0A	-	23	25	
gfs	Forward Transconductance	V_{DS}=5V, I_D= 5.0A	-	6.0	-	S
• Dynamic Characteristics [d]						
C_{iss}		V_{DS}=15V, V_{GS}=0V, f=1MHz	-	458	-	pF
C_{oss}			-	79	-	
C_{rss}	Reverse Transfer Capacitance		-	63	-	
• 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 .

P-Channel Electrical Characteristics (T_A=25°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}			-11	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	-1.5	-3	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-6.5A	-	25	34	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	35	56	
gfs	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	-	1320	-	pF
C_{oss}			-	651	-	
C_{rss}	Reverse Transfer Capacitance		-	448	-	
• 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)

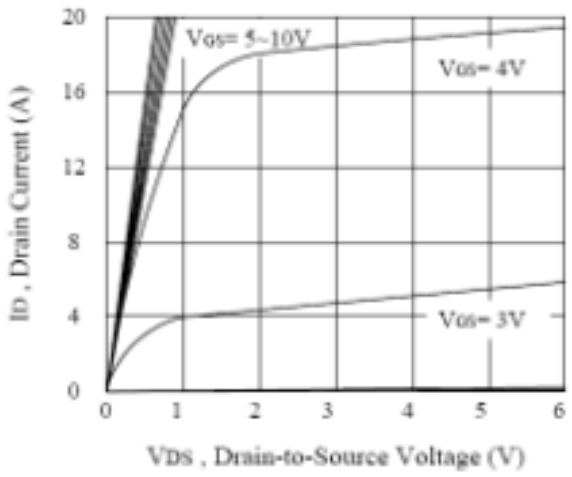


Figure 1. Output Characteristics

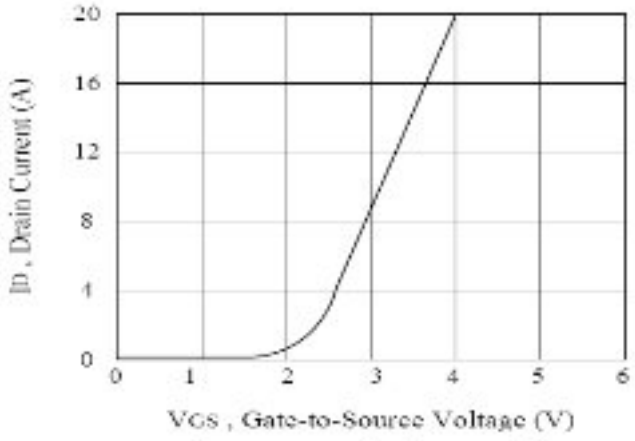


Figure 2. Transfer Characteristics

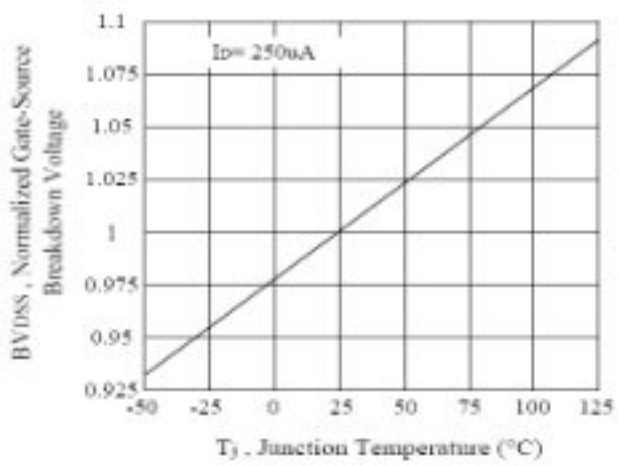


Figure 3. Breakdown Voltage Variation with Temperature

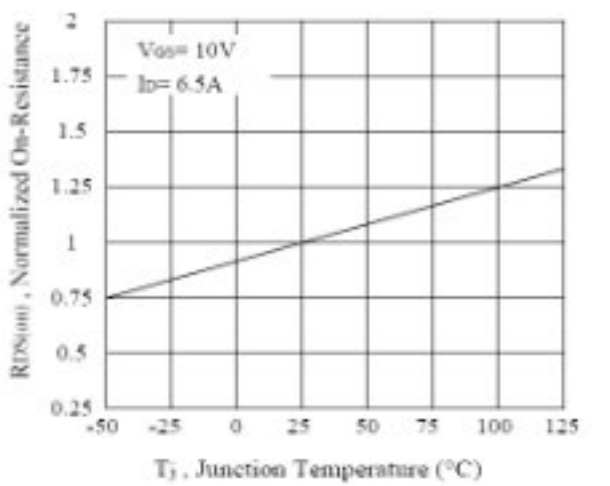


Figure 4. On-Resistance Variation with Temperature

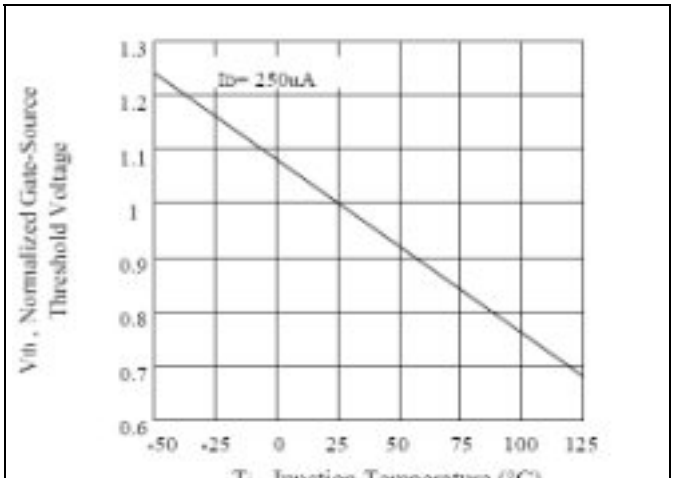
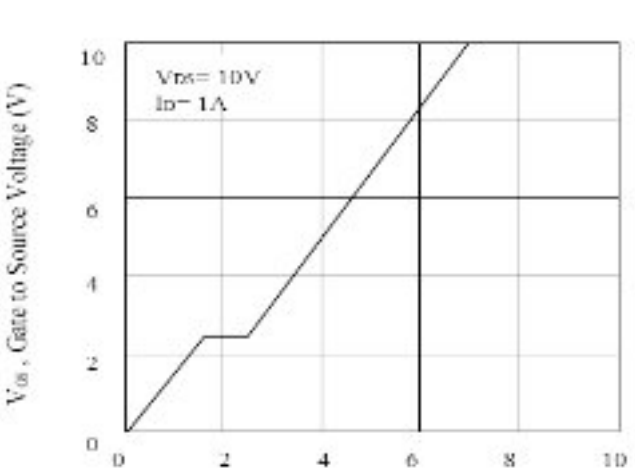


Figure 5. Gate Threshold Variation with Temperature



Characteristics Curve(N-Channel)

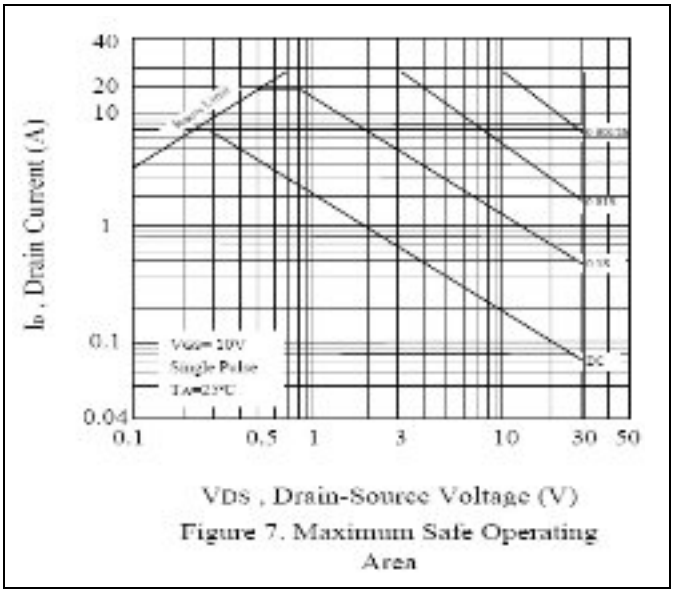


Figure 7. Maximum Safe Operating Area

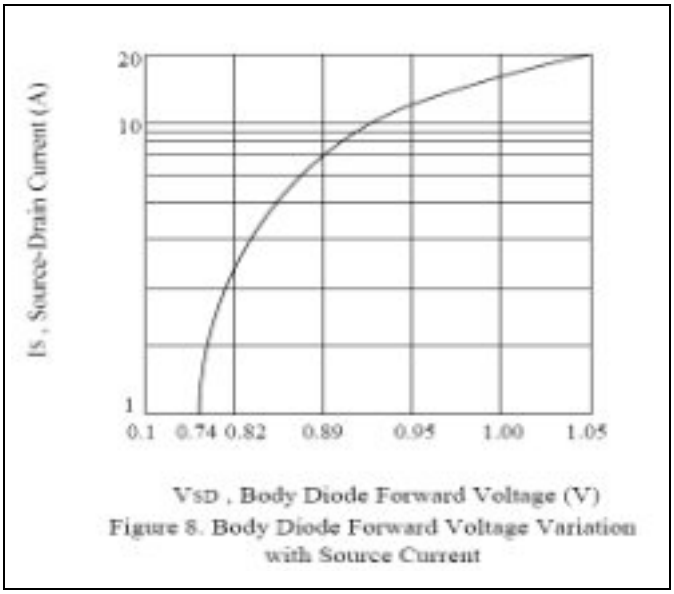
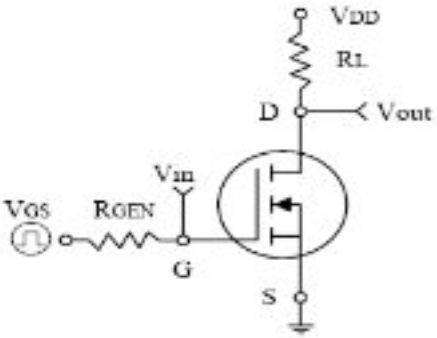


Figure 8. Body Diode Forward Voltage Variation with Source Current



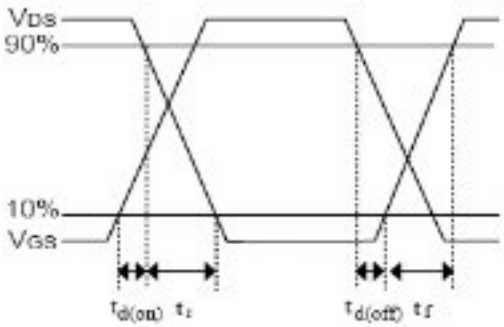


Figure 9. Switching Test Circuit and Switching Waveforms

Complementary High Density Trench MOSFET

Characteristics Curve(P-Channel)

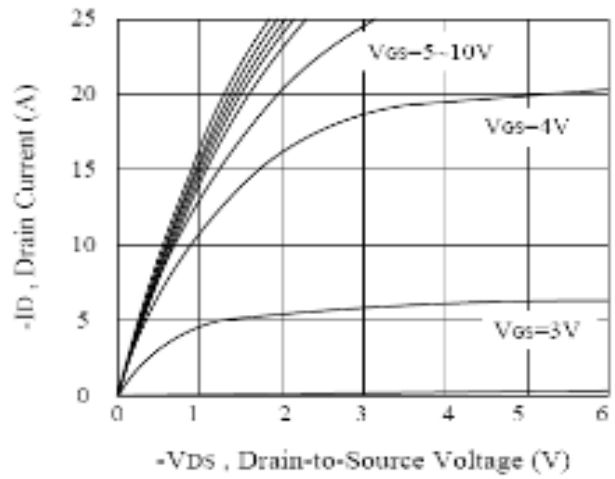


Figure 10 Output Characteristics

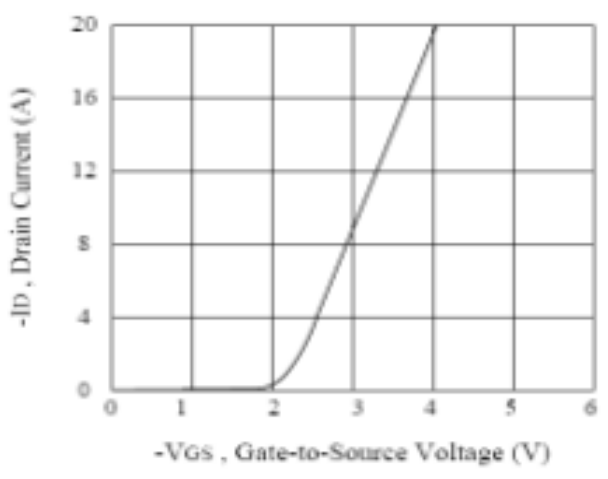


Figure 11 Transfer Characteristics

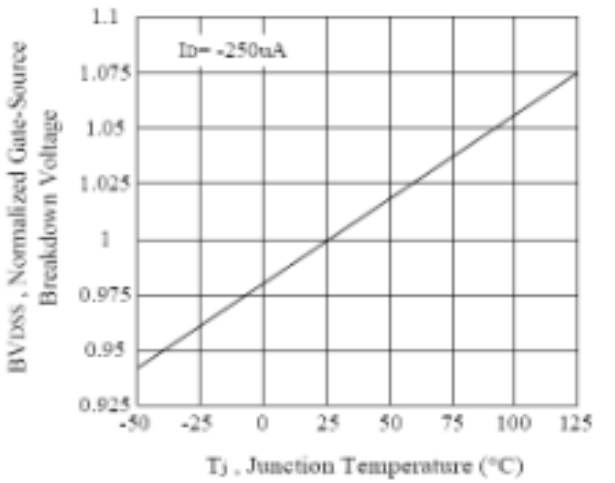


Figure 12 Breakdown Voltage Variation with

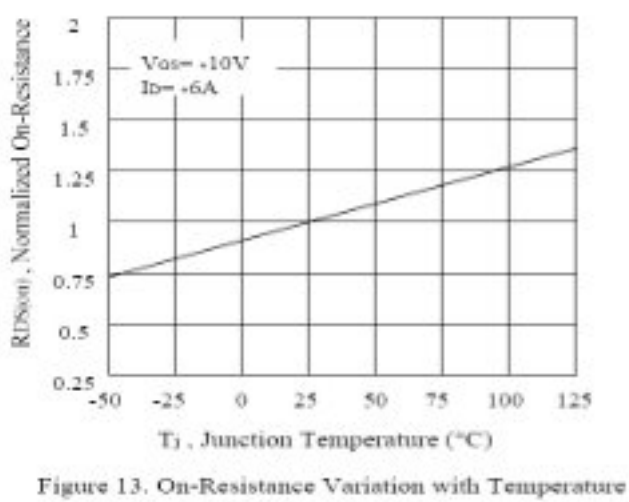


Figure 13. On-Resistance Variation with Temperature

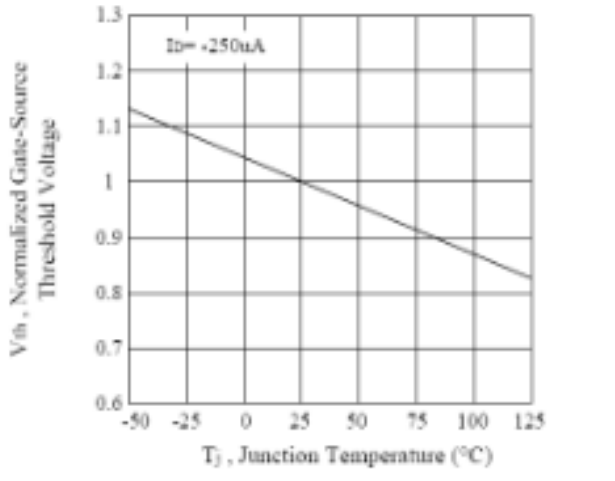


Figure 14 Gate Threshold Variation with Temperature

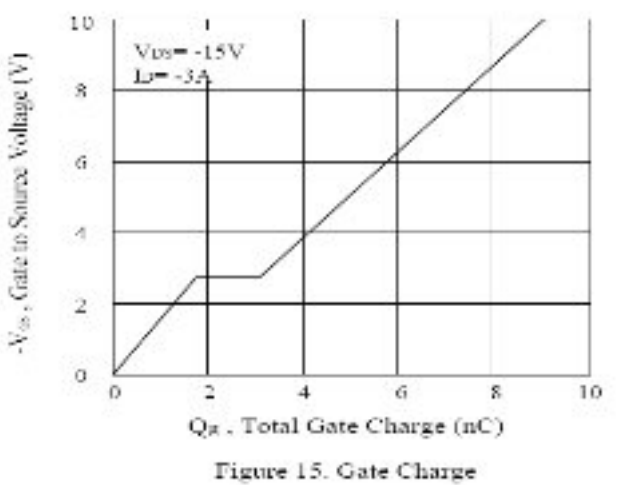


Figure 15. Gate Charge

Characteristics Curve(P-Channel)

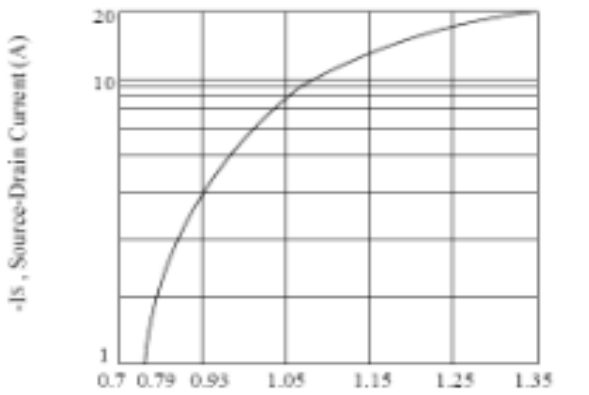


Figure 16 Body Diode Forward Voltage Variation with Source Current

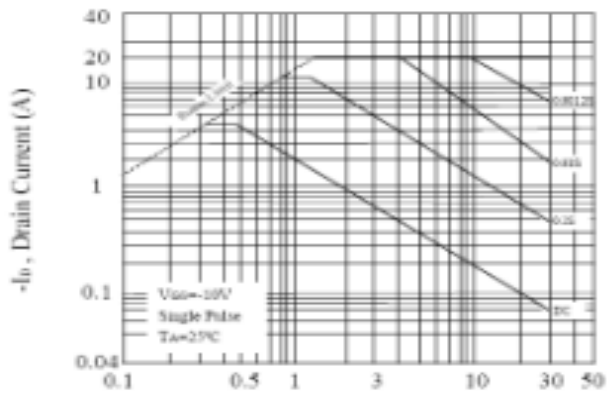
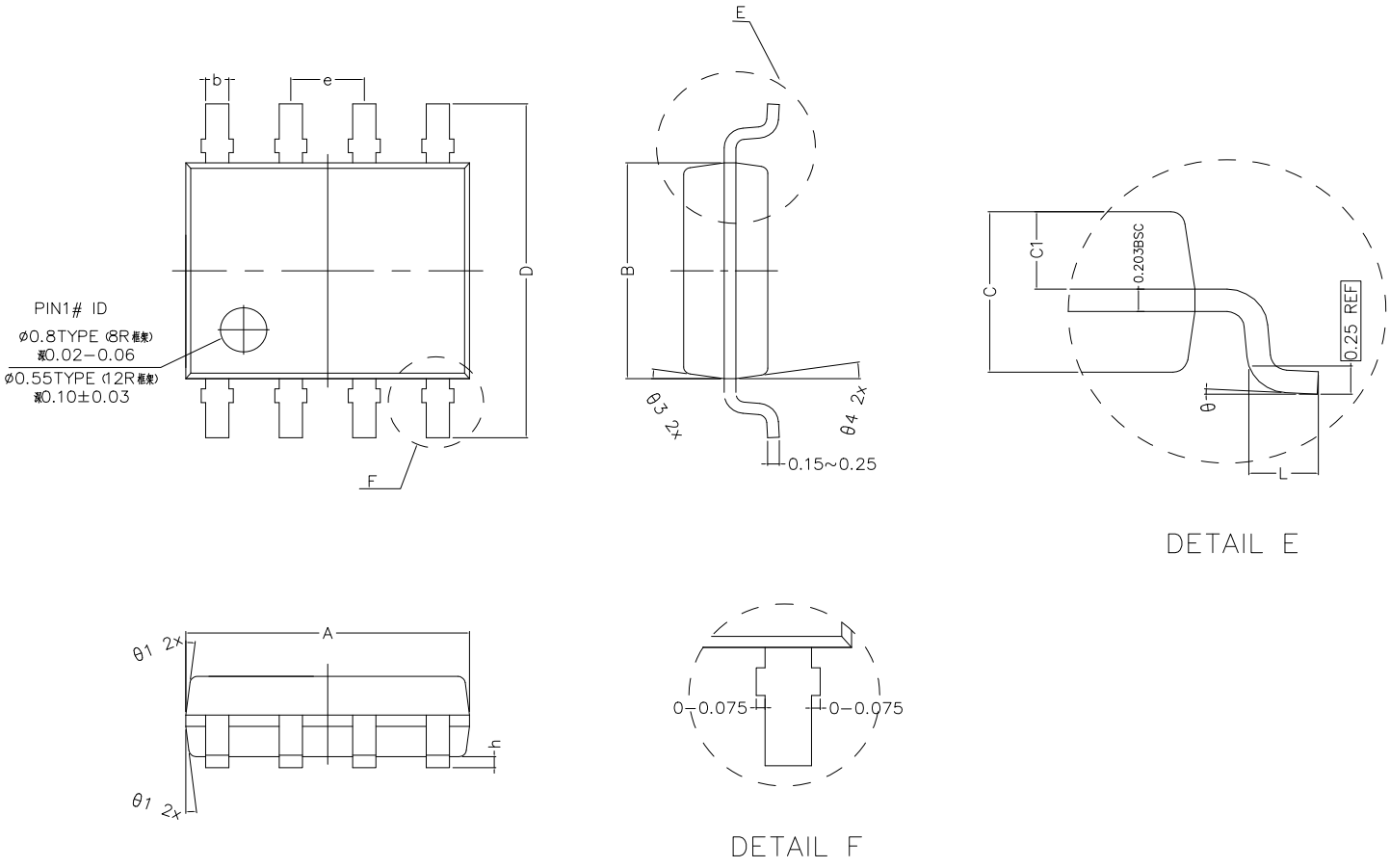


Figure 17. Maximum Safe Operating Area

Figure 18 Switching Test Circuit and Switching Waveforms

2022/12/01

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°		