

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

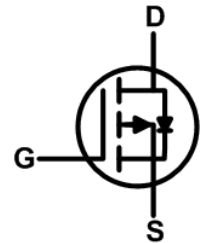
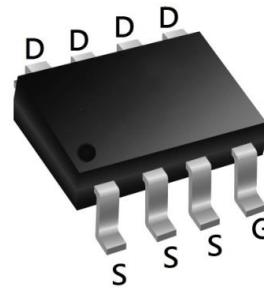

Product Summary

BVDSS	RDS(on)	ID
-30V	5.8 mΩ	-18 A

General Description

The XXW4409A is the high cell density trenched P-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

The XXW4409A meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration

Absolute Maximum Ratings (TA= 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source voltage		V _{DS}	-30	V
Gate-Source voltage		V _{GS}	±20	V
Continuous Drain Current	T _A =25°C	I _D	-18	A
	T _A =100°C		-8.8	
Pulsed Drain Current ¹		I _{DM}	-53	A
Single Pulse Avalanche Energy ²		EAS	80	mJ
Total Power Dissipation	T _A =25°C	P _D	3	W
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 to 150	°C

Thermal Characteristics

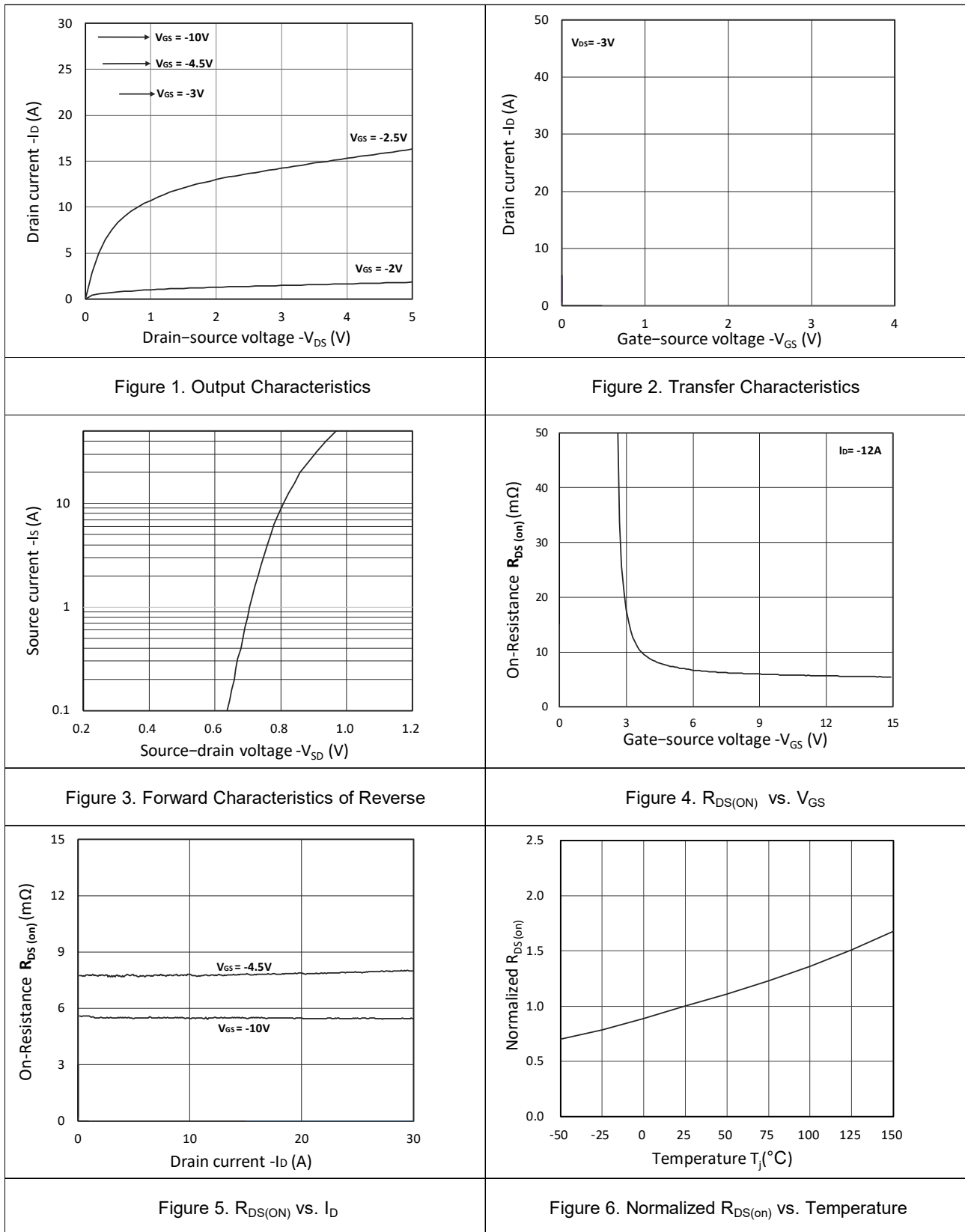
Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	R _{θJA}	41.6	°C/W

P-Ch 30V Fast Switching MOSFETs
Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V	
Gate-body Leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$	$T_J = 25^\circ\text{C}$	-	-	-1	μA
			$T_J = 100^\circ\text{C}$	-	-	-100	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-	-2.5	V	
Drain-Source On-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -12A$	-	5.8	9.2	m Ω	
		$V_{GS} = -4.5V, I_D = -10A$	-	8	14		
Forward Transconductance ⁴	g_{fs}	$V_{DS} = -10V, I_D = -10A$	-	50	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1\text{MHz}$	-	3100	-	pF	
Output Capacitance	C_{oss}		-	430	-		
Reverse Transfer Capacitance	C_{rss}		-	358	-		
Gate Resistance	R_g	$f = 1\text{MHz}$	-	9.5	-	Ω	
Switching Characteristics⁵							
Total Gate Charge	Q_g	$V_{GS} = -10V, V_{DS} = -15V, I_D = -12A$	-	35	-	nC	
Gate-Source Charge	Q_{gs}		-	9.9	-		
Gate-Drain Charge	Q_{gd}		-	10.5	-		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = -10V, V_{DD} = -15V, R_G = 3\Omega, I_D = -12A$	-	10.8	-	ns	
Rise Time	t_r		-	13.2	-		
Turn-Off Delay Time	$t_{d(off)}$		-	73	-		
Fall Time	t_f		-	35	-		
Reverse Recovery Time	t_{rr}	$I_F = -12A, dI_F/dt = 100A/\mu s$	-	25	-	ns	
Reverse Recovery Charge	Q_{rr}		-	10	-	nC	
Drain-source body diode Characteristics							
Diode Forward Voltage ⁴	V_{SD}	$I_S = -1A, V_{GS} = 0V$	-	-	-1.2	V	
Continuous Source Current	I_S	$T_A = 25^\circ\text{C}$	-	-	-14	A	

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ\text{C}$.
2. The EAS data shows Max. rating . The test condition is $V_{DD} = -25V, V_{GS} = -10V, L = 0.1\text{mH}, I_{AS} = -40A$.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics


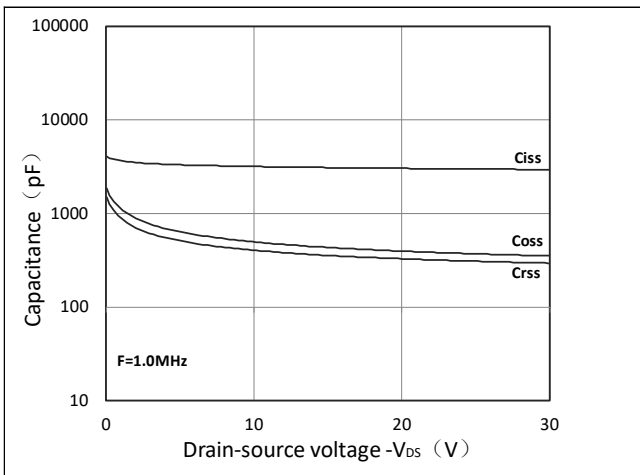


Figure 7. Capacitance Characteristics

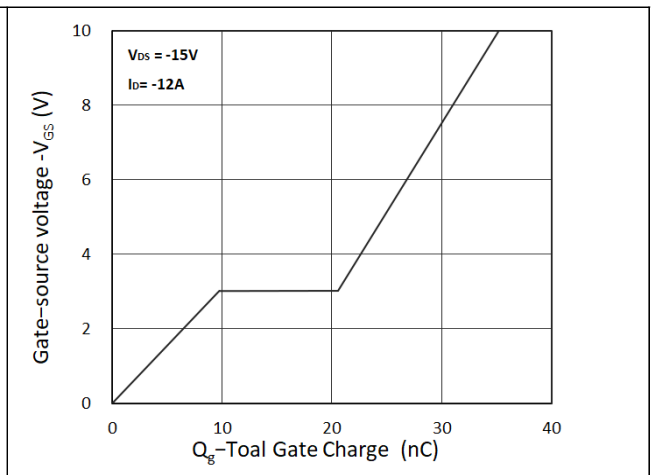


Figure 8. Gate Charge Characteristics

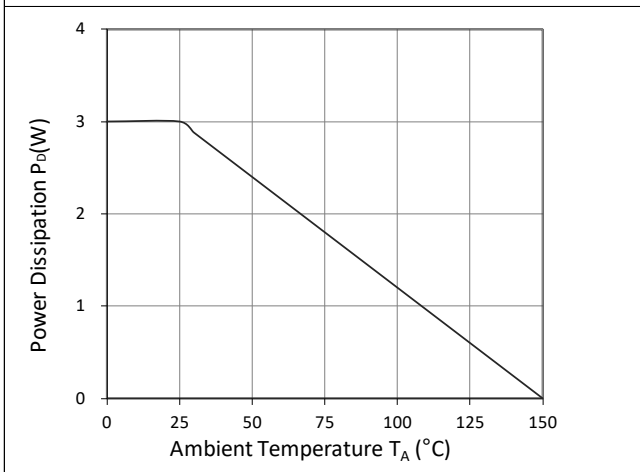


Figure 9. Power Dissipation

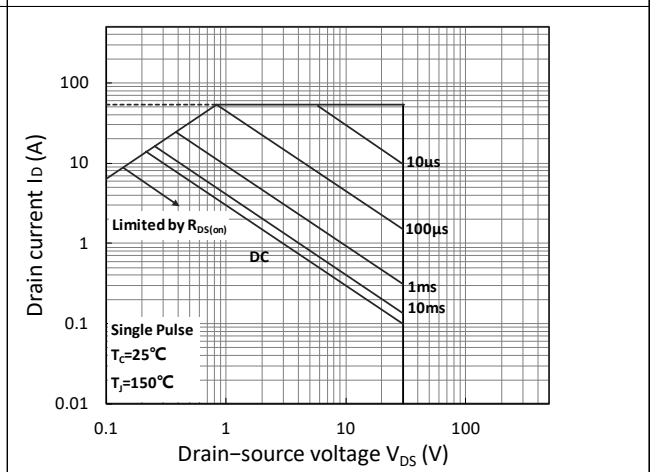


Figure 10. Safe Operating Area

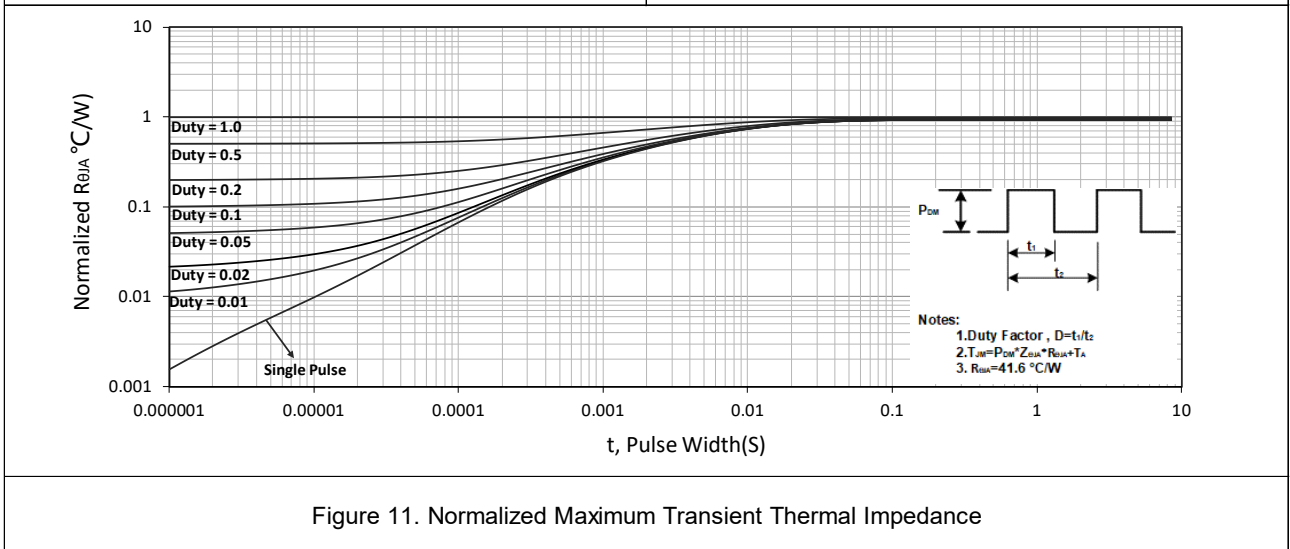


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

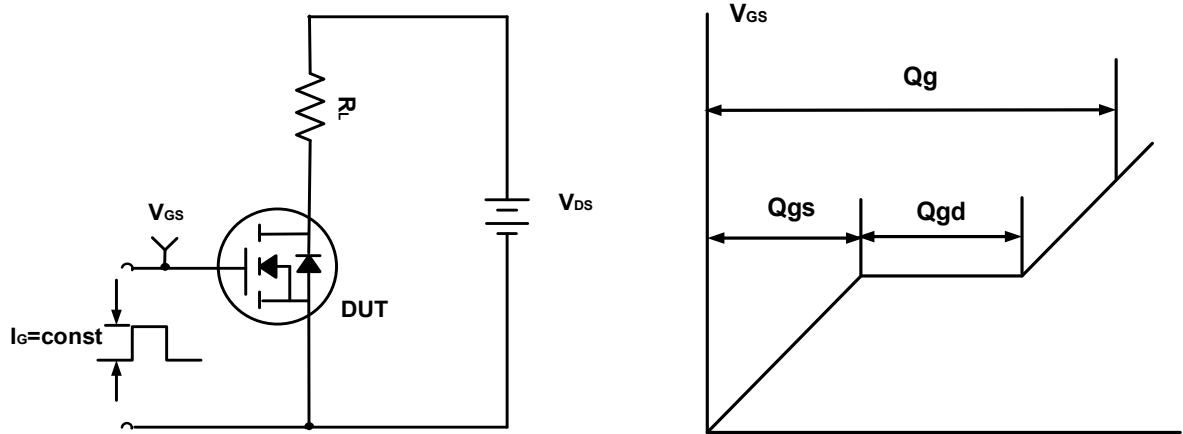


Figure A. Gate Charge Test Circuit & Waveforms

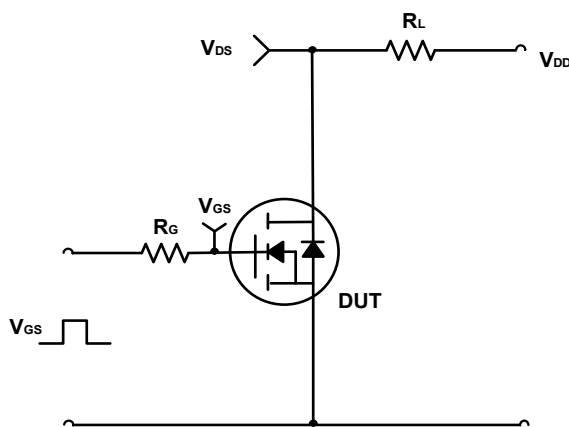


Figure B. Switching Test Circuit & Waveforms

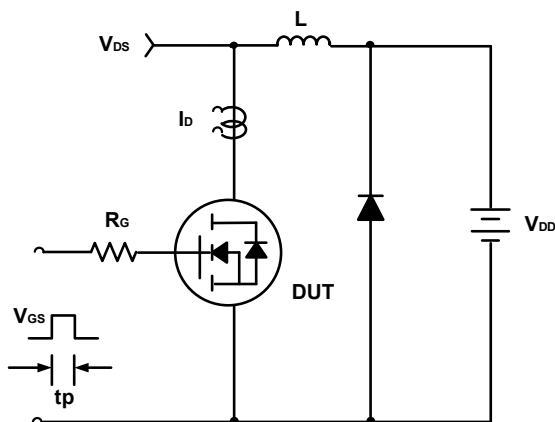
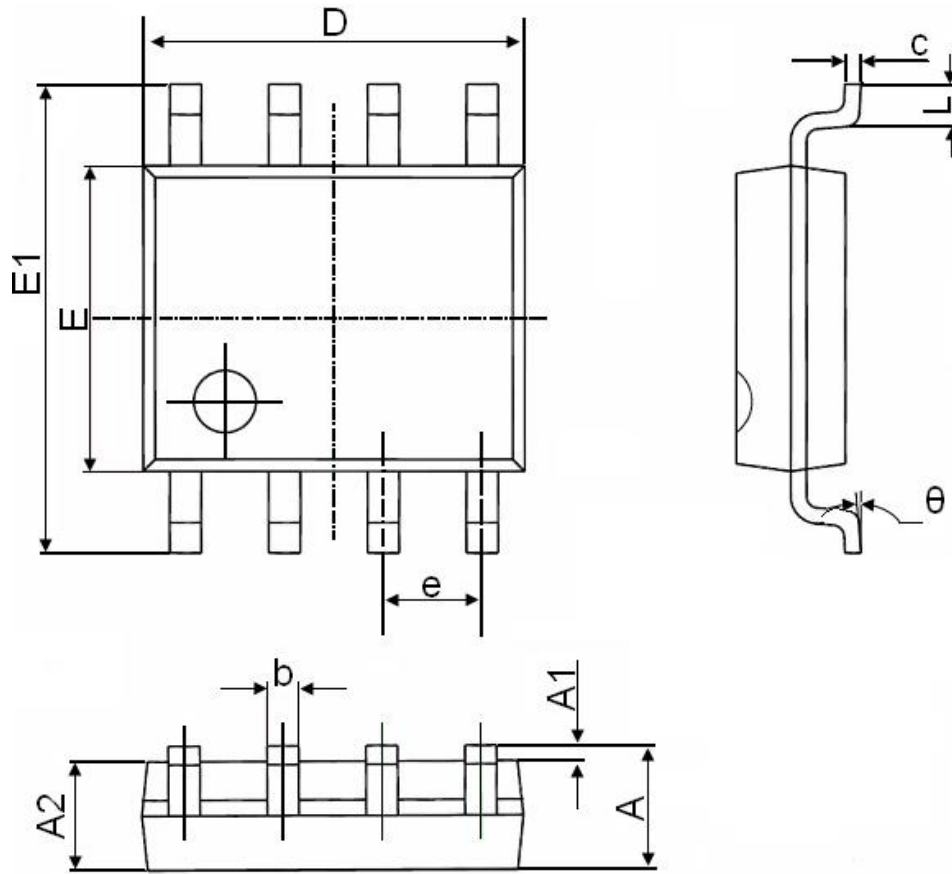


Figure C. Unclamped Inductive Switching Circuit & Waveforms

SOP-8 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°