

CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

The LX3080KS combines advanced trench technology to provide excellent $R_{DS(ON)}$, it tailored to minimize conduction loss, and provide superior switching performance. It can be used in wide variety of application.

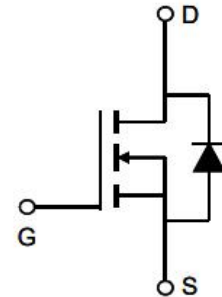
Features

- $V_{DS}=30V$, $I_D=80A$
 $R_{DS(ON)typ.}=4.3m\Omega@V_{GS}=10V$
 $R_{DS(ON)typ.}=7.1m\Omega@V_{GS}=4.5V$
- 100% avalanche tested
- Fast switching
- High power and current handing capability
- Termination is Lead-free and RoHS Compliant

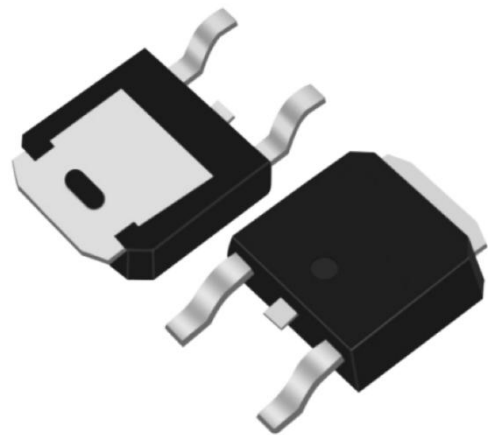


Applications

- PWM applications
- Load switch
- Power Management



Schematic Diagram



TO252 Package

Maximum Ratings

($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	$I_D(T_C=25^{\circ}C)$	80	A
	$I_D(T_C=100^{\circ}C)$	45	A
Pulsed Drain Current ^{BC}	I_{DM}	320	A
Maximum Power Dissipation ^{AC}	P_D	83	W
Single pulse avalanche energy ^D	E_{AS}	306	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction to Case	R_{QJC}	1.4	$^{\circ}\text{C/W}$
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Electrical Characteristics

($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	30	--	--	V
Gate-Threshold Voltage	V _{th(GS)}	V _{DS} = V _{GS} , I _D =250 uA	1	1.5	2.2	V
Gate-body Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	--	--	±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	--	--	1	uA
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =30A	--	4.3	6	mΩ
		V _{GS} =4.5V, I _D =20A	--	7.1	9	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} =0V, F=1MHz	--	1970	--	pF
Output Capacitance	C _{Oss}		--	215	--	
Reverse Transfer Capacitance	C _{rss}		--	178	--	
Switching Capacitance						
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, R _L =3Ω V _{GS} = 10V, R _{GEN} =3Ω	--	20	--	nS
Turn-on Rise Time	t _r		--	15	--	nS
Turn-off Delay Time	t _{d(off)}		--	60	--	nS
Turn-off Fall Time	t _f		--	10	--	nS
Total Gate Charge	Q _g	V _{DS} = 15V, I _D =5A, V _{GS} =4.5V	--	37.3	--	nC
Gate-Source Charge	Q _{gs}		--	5.8	--	nC
Gate-Drain Charge	Q _{gd}		--	7.7	--	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _D =5A	--	--	1.2	V
Diode Forward Current	I _s		--	--	80	A

Notes:

- The Power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using $\leq 10s$ junction-to ambient thermal resistance.
- Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^{\circ}\text{C}$.
- The Static characteristics in Figures are obtained using $<300\mu s$ pulses, duty cycle 2% max.
- E_{AS} condition: $T_J=25^{\circ}\text{C}, V_{DD}=15V, V_{GS}=10V, R_G=25\Omega, L=0.5mH$.

Typical Electrical and Thermal Characteristics

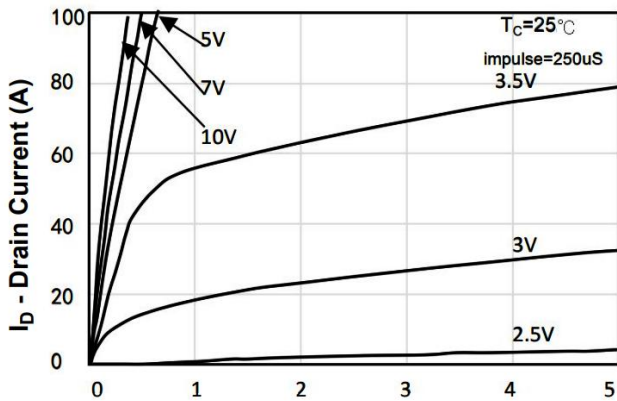


Figure 1. On-Region Characteristics

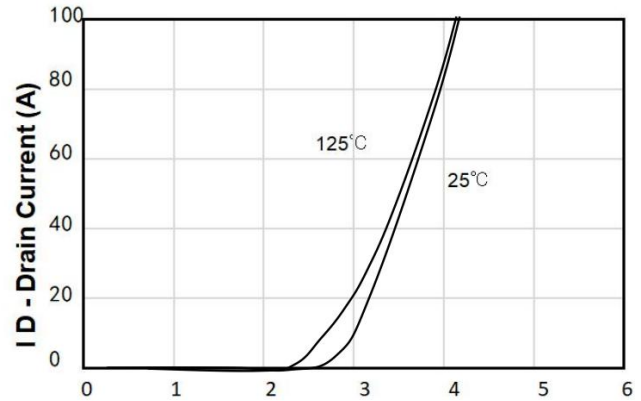


Figure 2. Transfer Characteristics

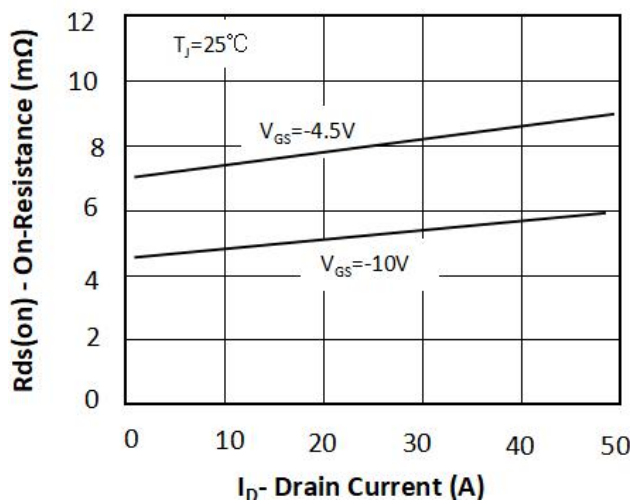


Figure 3. On-resistance vs. Drain Current

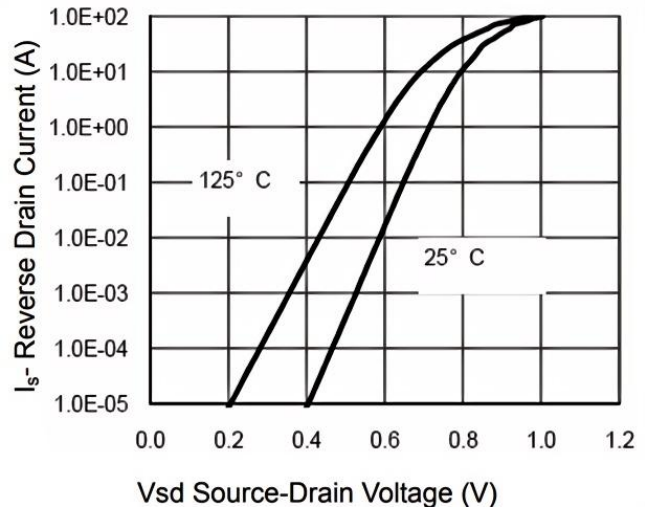


Figure 4. Body Diode Characteristics

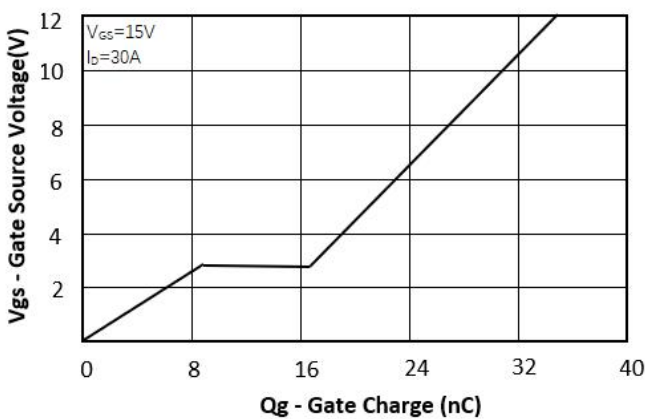


Figure 5. Gate Charge Characteristics

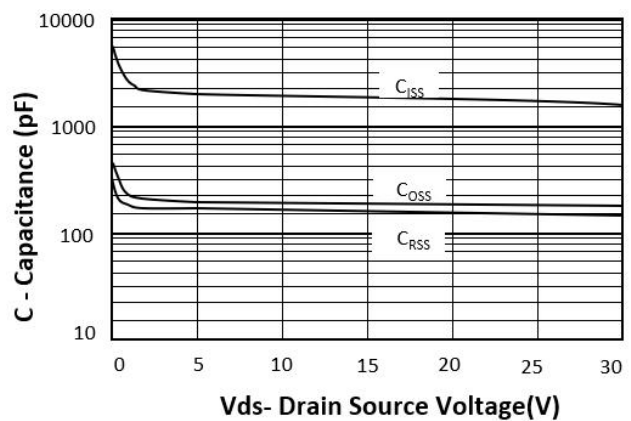


Figure 6. Capacitance Characteristics

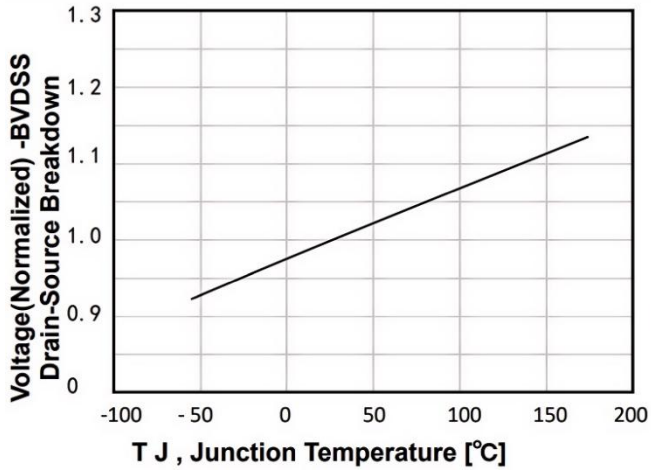


Figure 7. Breakdown Voltage Variation vs Temperature

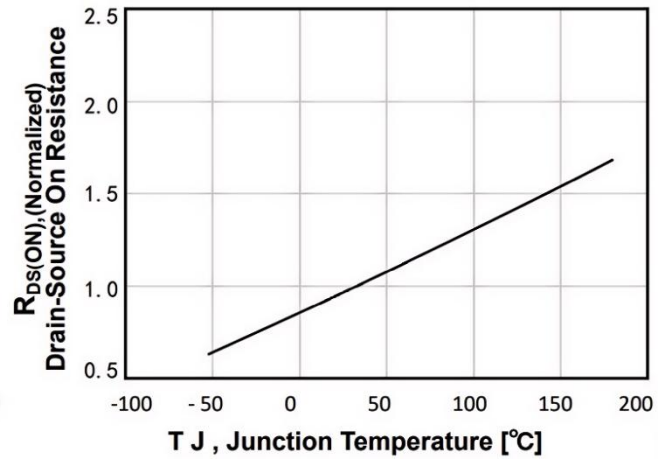


Figure 8. On-Resistance Variation vs Temperature

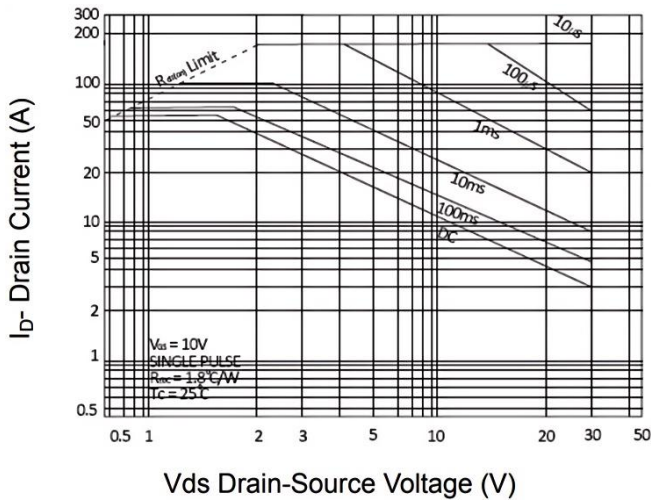


Figure 9. Safe Operation Area

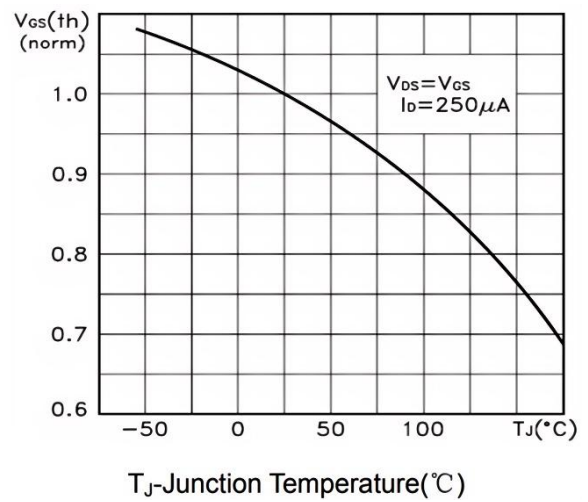


Figure 10. Current - Junction Temperature

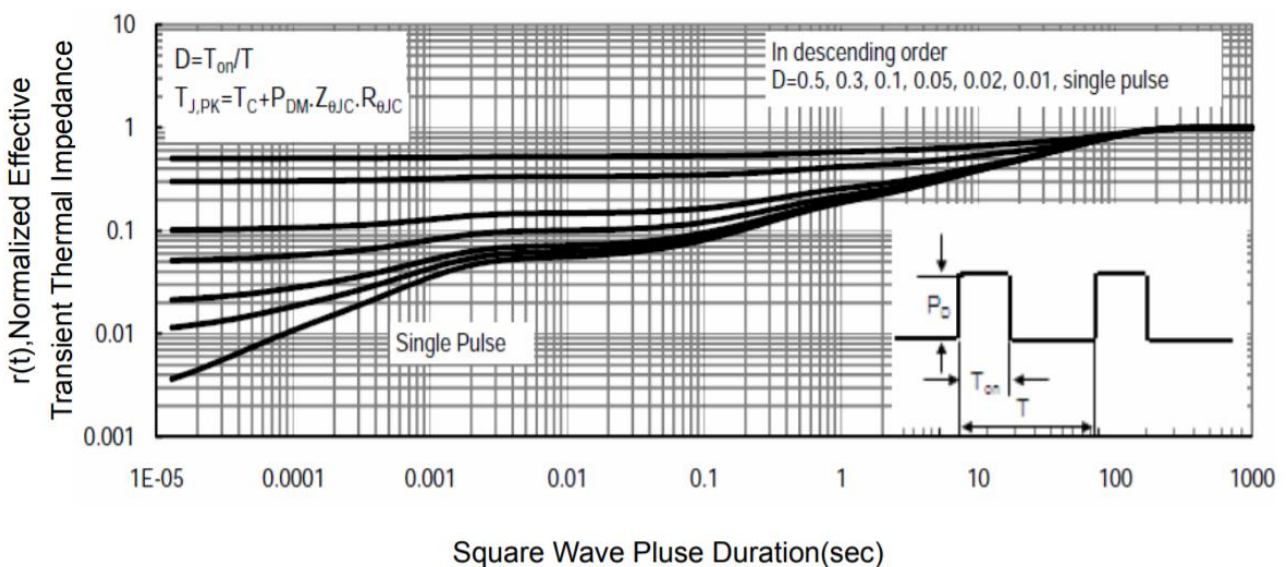
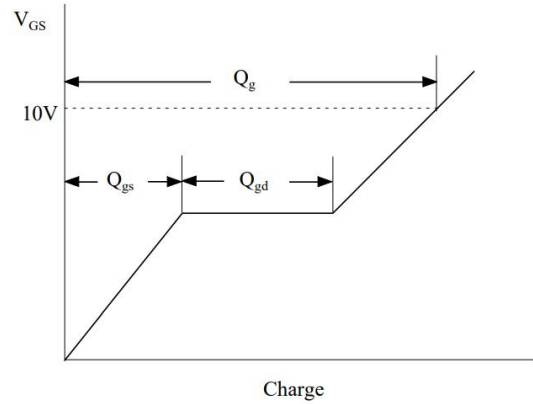
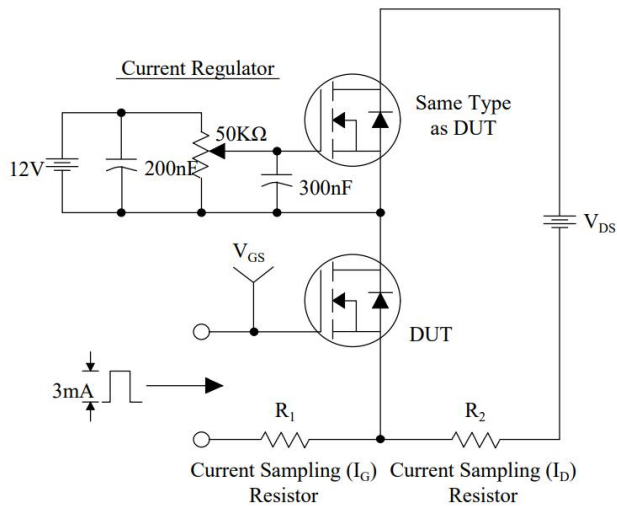
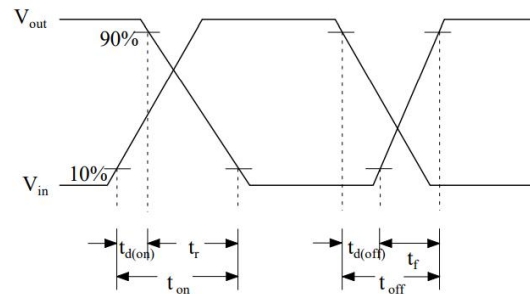
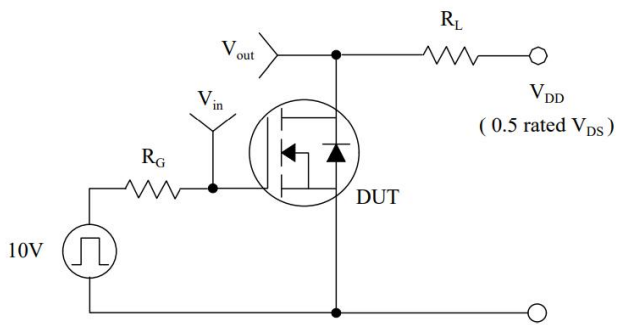


Figure 11 Normalized Maximum Transient Thermal Impedance

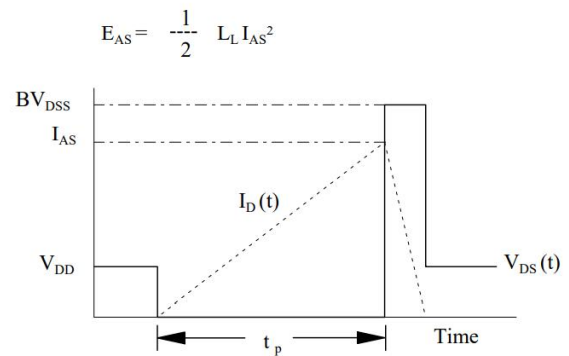
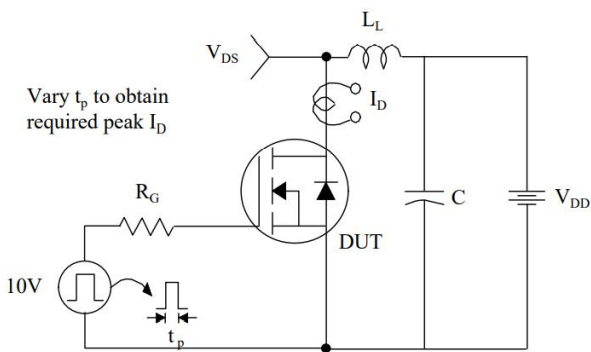
Gate Charge Test Circuit & Waveform



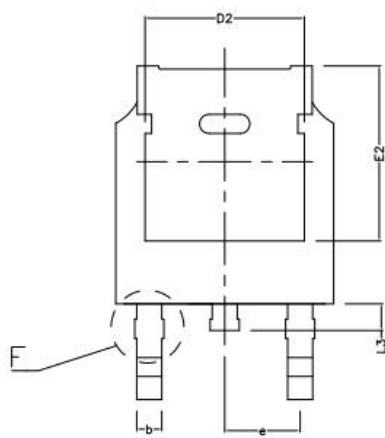
Resistive Switching Test Circuit & Waveforms



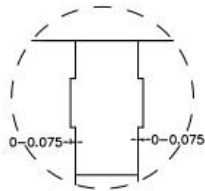
Unclamped Inductive Switching Test Circuit & Waveforms



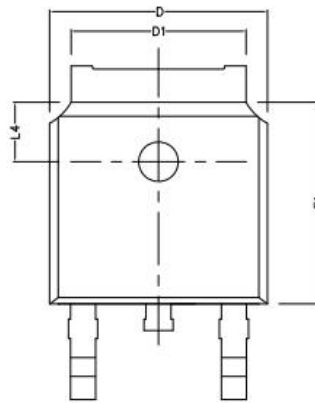
TO252 Package Information



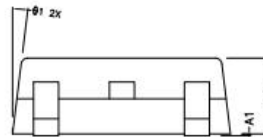
BOTTOM VIEW



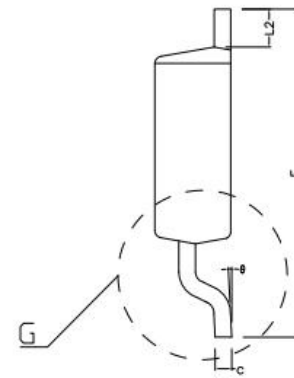
DETAIL F



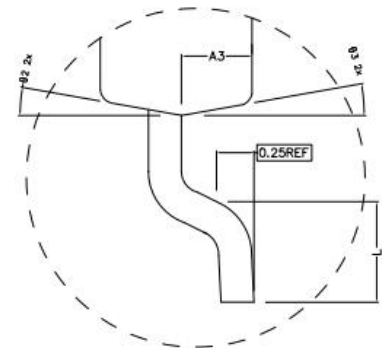
TOP VIEW



SIDE VIEW



SIDE VIEW



DETAIL G

	MIN	NORMAL	MAX		MIN	NORMAL	MAX
A1	0.000	0.100	0.150	E2	5.600REF		
A2	2.200	2.300	2.400	e	2.286TYPE		
A3	1.020	1.070	1.120	L	1.400	1.550	1.700
b	0.710	0.760	0.810	L2	1.10REF		
c	0.460	0.508	0.550	L3	0.80REF		
D	6.500	6.600	6.700	L4	1.8REF		
D1	5.330REF			θ	0~8°		
D2	4.830REF			θ1	7° TYPE		
E	9.900	10.100	10.300	θ2	10° TYPE		
E1	6.000	6.100	6.200	θ3	10° TYPE		

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