



### Features

- Low On-Resistance
- Fast Switching Speed
- 100% avalanche tested
- Lead Free and Green Devices  
Available (RoHS Compliant)

### Product Summary

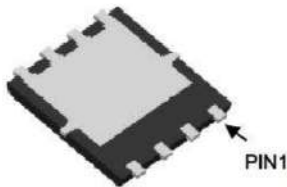


$V_{DSS}$	40	V
$R_{DS(ON)-Typ@V_{GS}=10V}$	3.5	m $\Omega$
$I_D$	80	A

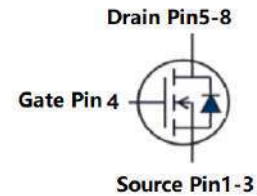
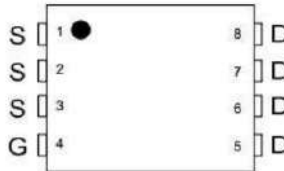
### Application

- DC/DC Converters
- On board power for server
- Synchronous rectification

Top View



DFN5\*6-8



N-Channel

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	40	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 50	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}^{①}$	300 $\mu\text{s}$ Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 320	A
$I_D^{②}$	Continuous Drain Current@ $T_C(V_{GS}=10V)$	$T_C=25^\circ\text{C}$ 80	A
		$T_C=100^\circ\text{C}$ 51	
	Continuous Drain Current@ $T_A(V_{GS}=10V)^{③}$	$T_A=25^\circ\text{C}$ 25	
		$T_A=70^\circ\text{C}$ 19	
$P_D$	Maximum Power Dissipation@ $T_C$	$T_C=25^\circ\text{C}$ 65	W
		$T_C=100^\circ\text{C}$ 26	
	Maximum Power Dissipation@ $T_A^{③}$	$T_A=25^\circ\text{C}$ 4.2	
		$T_A=70^\circ\text{C}$ 2.7	

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.92	$^{\circ}\text{C/W}$
$R_{\theta JA}$ <sup>③</sup>	Thermal Resistance-Junction to Ambient	30	$^{\circ}\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
$E_{AS}$ <sup>④</sup>	Avalanche Energy, Single Pulsed	121	mJ

**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  Unless Otherwise Noted)

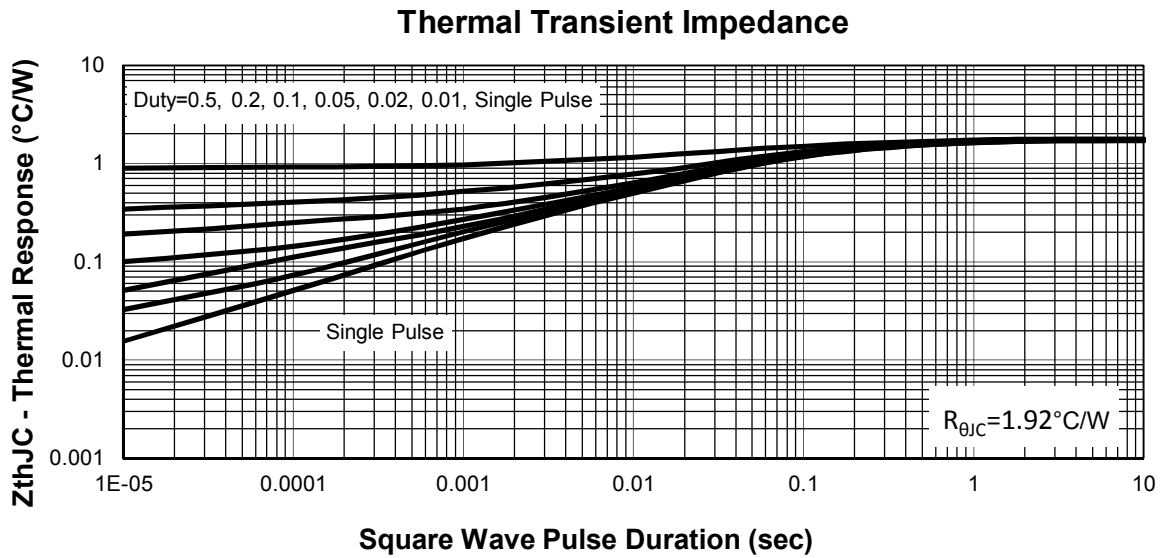
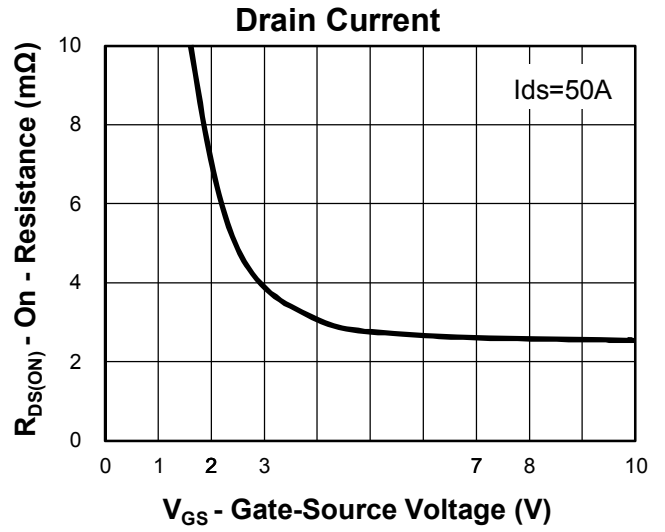
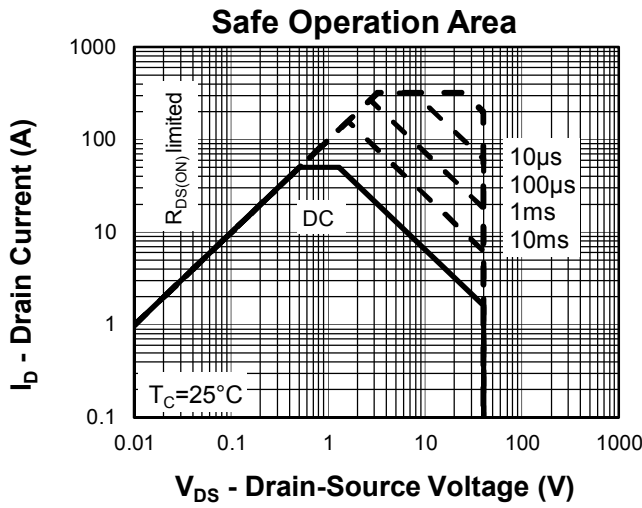
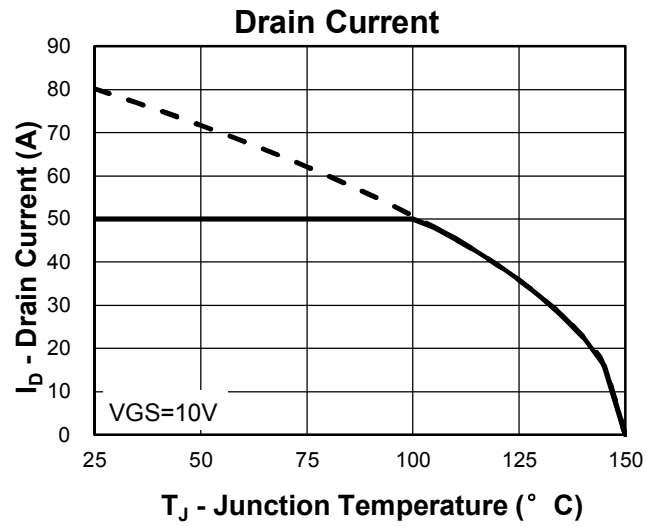
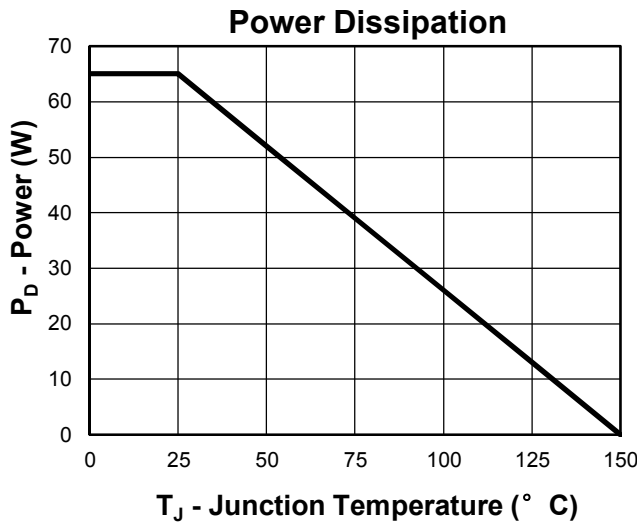
Symbol	Parameter	Test Condition	LIMIT			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu\text{A}$	40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$			1	$\mu\text{A}$
		$T_J=125^{\circ}\text{C}$			30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu\text{A}$	1		2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}$ <sup>⑤</sup>	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=35A$		4.5	5.5	$\text{m}\Omega$
		$V_{GS}=10V, I_{DS}=50A$		3.5	4.5	$\text{m}\Omega$
<b>Diode Characteristics</b>						
$V_{SD}$ <sup>⑤</sup>	Diode Forward Voltage	$I_{SD}=50A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=50A, dI_{SD}/dt=100A/\mu\text{s}$		18		ns
$Q_{rr}$	Reverse Recovery Charge			29		nC
<b>Dynamic Characteristics</b> <sup>⑥</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.3		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=20V, \text{Frequency}=1.0\text{MHz}$		1560		pF
$C_{oss}$	Output Capacitance			780		
$C_{rss}$	Reverse Transfer Capacitance			80		
$t_{d(ON)}$	Turn-on Delay Time			13		
$t_r$	Turn-on Rise Time	$V_{DD}=20V, I_{DS}=50A, V_{GEN}=10V, R_G=4.7\Omega$		21		
$t_{d(OFF)}$	Turn-off Delay Time			29		
$t_f$	Turn-off Fall Time			9		
<b>Gate Charge Characteristics</b> <sup>⑥</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=32V, V_{GS}=10V, I_{DS}=50A$		29		nC
$Q_{gs}$	Gate-Source Charge			5		
$Q_{gd}$	Gate-Drain Charge			9		

Notes:

- ①Pulse width limited by safe operating area.
- ②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 50A.
- ③When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ .
- ④Limited by  $T_{J\text{max}}$ ,  $I_{AS} = 22\text{A}$ ,  $V_{DD} = 24\text{V}$ ,  $R_G = 50\ \Omega$ , Starting  $T_J = 25^\circ\text{C}$ .
- ⑤Pulse test;Pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- ⑥Guaranteed by design, not subject to production testing.



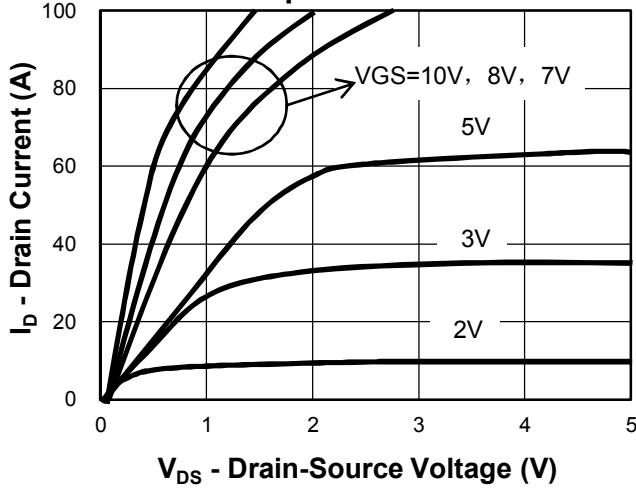
### Typical Characteristics



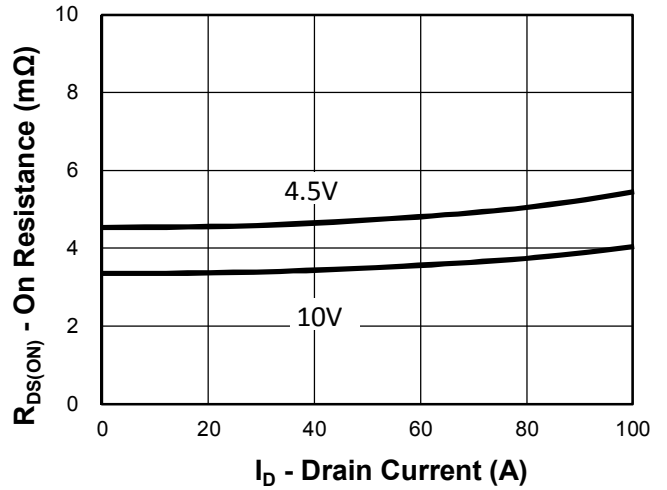


### Typical Characteristics

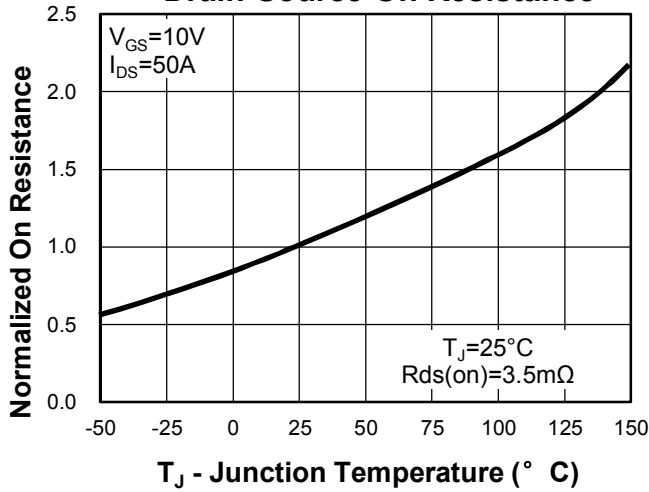
#### Output Characteristics



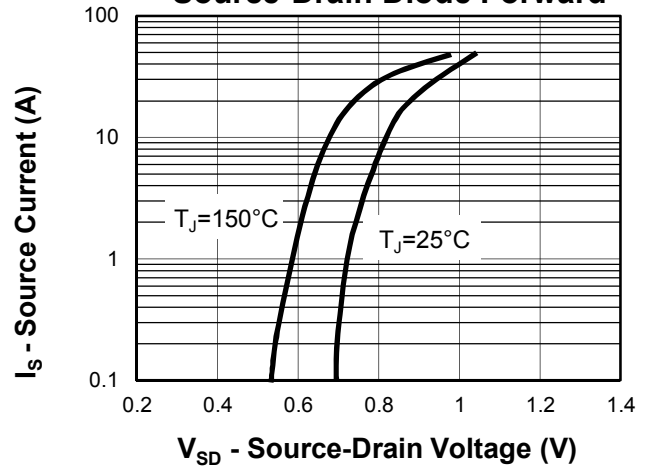
#### Drain-Source On Resistance



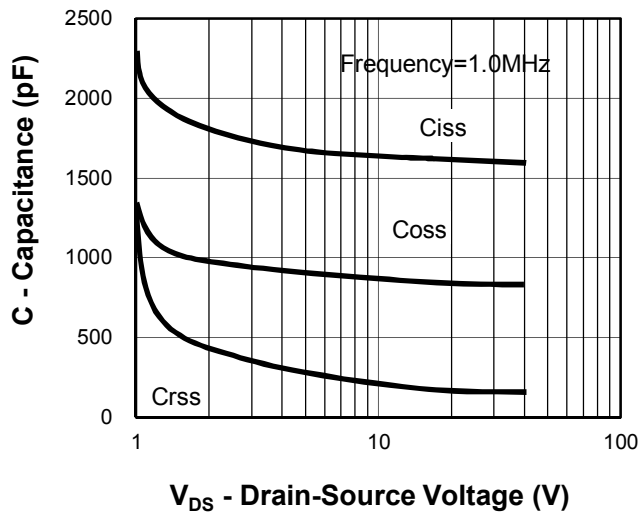
#### Drain-Source On Resistance



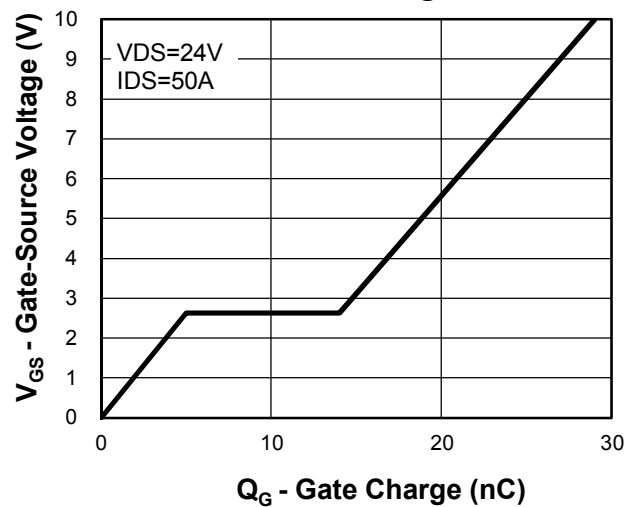
#### Source-Drain Diode Forward



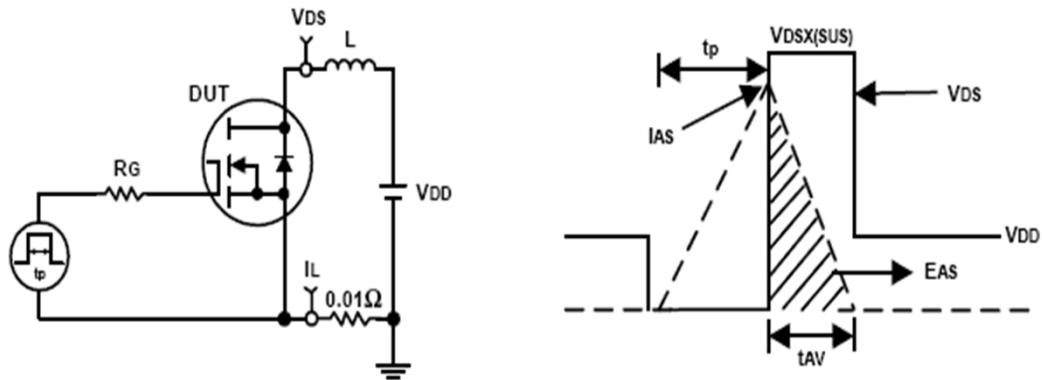
#### Capacitance



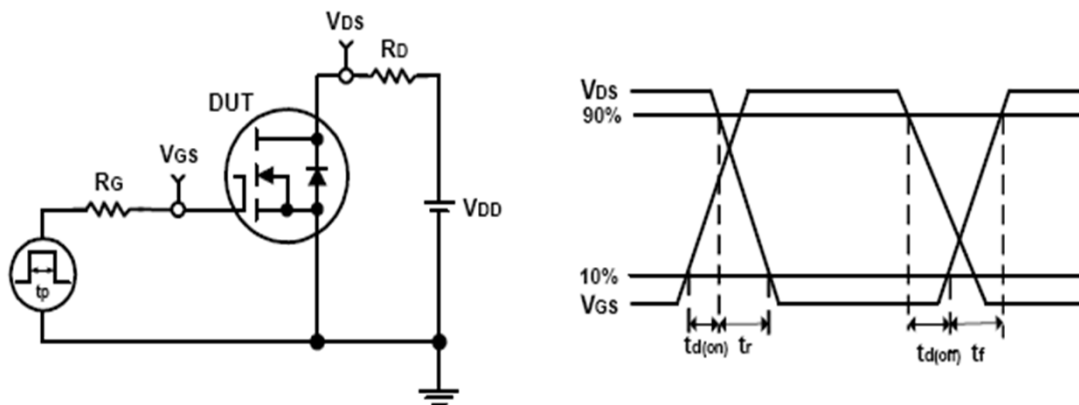
#### Gate Charge



### Avalanche Test Circuit and Waveforms

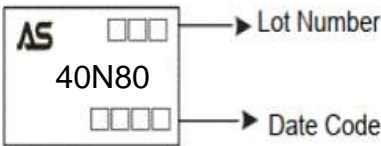


### Switching Time Test Circuit and Waveforms

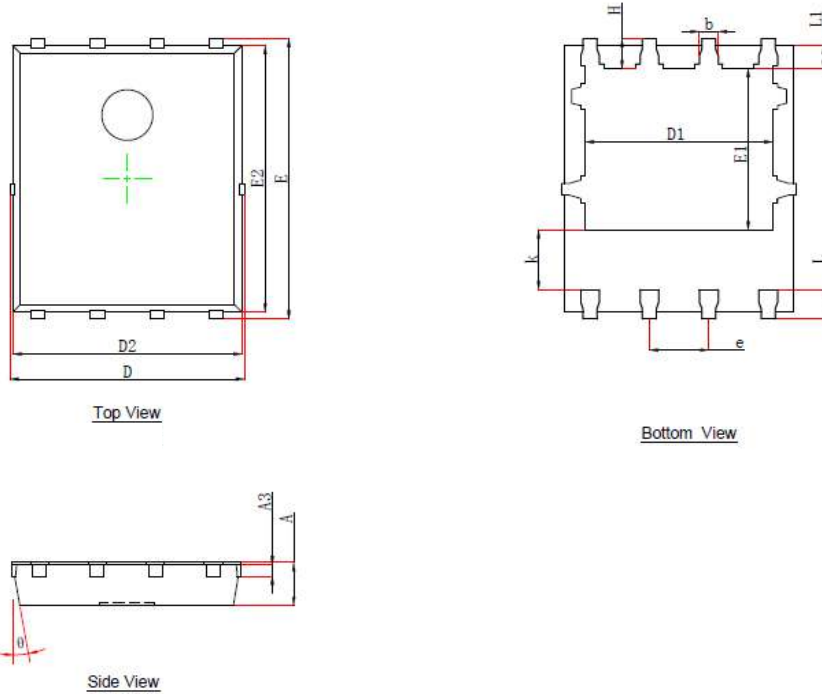


## Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM40N80Q-R	40N80	DFN5*6-8	Tape&Reel	4000/Reel

PACKAGE	MARKING
DFN5*6-8	 <p>AS □□□ → Lot Number 40N80 □□□□ → Date Code</p>

### DFN5\*6- 8 PACKAGE IN FORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
$\theta$	10°	12°	10°	12°



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