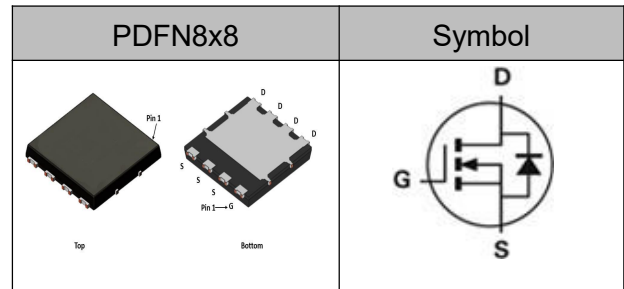


Features

- ◆ 100V, 450A, $R_{DS(ON)}$ (Typ.) = $1.3m\Omega @ V_{GS} = 10V$
- ◆ Reliable and Rugged
- ◆ Fast Switching Speed
- ◆ Green Device Available
- ◆ 100% EAS Guaranteed

Application

- ◆ Hot Swap
- ◆ DC/DC Converter
- ◆ High Frequency Switching and Synchronous
- ◆ Telecommunication Systems based on a 48V backplane/Supply Rail



Absolute Maximum Ratings $T_A = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	
I_D	Drain Current-Continuous, $T_C = 25^\circ C$	450	A
	Drain Current-Continuous, $T_C = 100^\circ C$	318	
	Drain Current-Continuous, $T_A = 25^\circ C$	40	
	Drain Current-Continuous, $T_A = 75^\circ C$	32	
I_{DM}	Drain Current-Pulsed ^a	1350	
E_{AS}	Avalanche Energy, Single pulse ^b	1406	mJ
I_{AS}	Avalanche Current	75	A
P_D	Total Power Dissipation @ $T_C = 25^\circ C$	577	W
	Total Power Dissipation @ $T_C = 100^\circ C$	288	
	Total Power Dissipation @ $T_A = 25^\circ C$	5	
	Total Power Dissipation @ $T_A = 70^\circ C$	3.5	
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to 175	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance Junction-Case	0.26	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ^c	30	$^\circ C/W$
$R_{\theta JT}$	Thermal Resistance Junction-Top of package ^c	15	$^\circ C/W$

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted
■ Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
		$T_J = -55^\circ\text{C}$	-	106	-	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	$I_D = 1mA$	-	49	-	mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	± 1	μA
		$T_J = 125^\circ\text{C}$	-	-	± 20	
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		-	-9.1	-	mV/ $^\circ\text{C}$
$R_{DS(on)}$	Static Drain-Source On-Resistance ^d	$V_{GS} = 10V, I_D = 25A, T_J = 25^\circ\text{C}$	-	1.3	1.6	m Ω
		$V_{GS} = 10V, I_D = 25A, T_J = 100^\circ\text{C}$	-	1.8	2.3	
		$V_{GS} = 10V, I_D = 25A, T_J = 175^\circ\text{C}$	-	2.5	3.1	
G_{FS}	Forward Transconductance	$V_{DS} = 5V, I_D = 50A$	-	86	-	S

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_g	Gate Resistance	$f = 1.0MHz$	-	0.96	-	Ω
C_{iss}	Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$	-	12300	-	pF
C_{oss}	Output Capacitance		-	4090	-	
C_{rss}	Reverse Transfer Capacitance		-	197	-	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 50V, I_D = 25A, R_G = 1\Omega, V_{GS} = 10V$	-	49	-	ns
t_r	Turn-On Rise Time		-	60	-	
$t_{d(off)}$	Turn-Off Delay Time		-	116	-	
t_f	Turn-Off Fall Time		-	63	-	
Q_g	Total Gate Charge	$V_{DS} = 50V, I_D = 25A, V_{GS} = 6V$	-	125	-	nC
Q_g	Total Gate Charge	$V_{DS} = 50V, I_D = 25A, V_{GS} = 10V$	-	191	-	
Q_{gs}	Gate-Source Charge		-	50	-	
Q_{gd}	Gate-Drain Charge		-	59	-	
V_{gp}	Gate Plateau Voltage		-	4.7	-	

**■ Drain-Source Diode Characteristics**

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	-	-	450	A
I_{SM}	Pulse Source Current		-	-	1350	A
V_{SD}	Drain-Source Diode Forward Voltage ^d	$V_{GS} = 0V$, $I_{SD} = 25A$	-	0.77	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 25A$, $V_R = 50V$ $di/dt=100A/us$,	-	72	-	ns
Q_{rr}	Reverse Recovery Charge		-	114	-	nC

Notes:

- a: Max. current is limited by junction temperature.
- b: The EAS data shows Max. Rating. The test condition is $V_{DD}=50V$, $V_{GS}=10V$, $L=0.5mH$, $I_{AS}=75A$.
- c: Surface Mounted on 1in2 FR-4 board with 1oz.
- d: Pulse test (pulse width $\leq 300us$, duty cycle $\leq 2\%$).
- e: Guaranteed by design, not subject to production testing.

Typical Characteristics

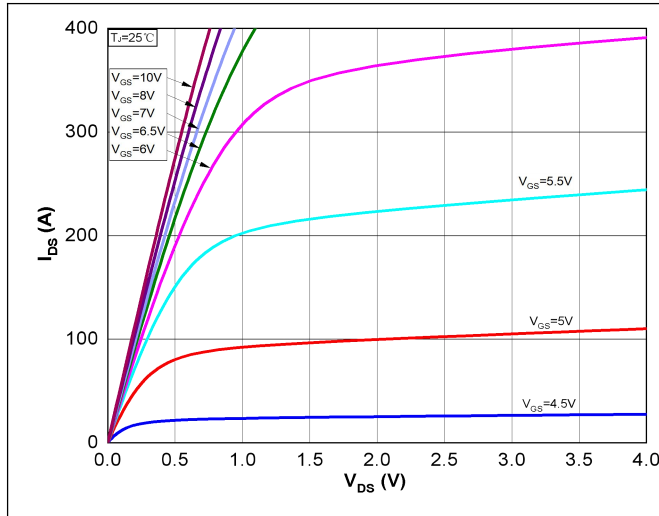


Figure 1. Typical Output Characteristics

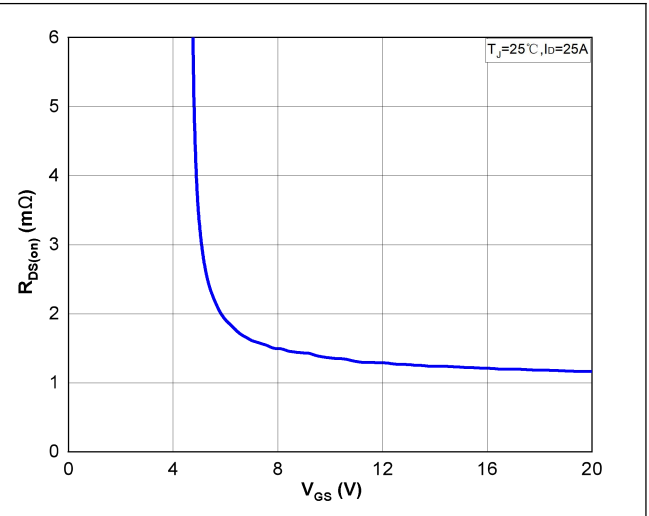


Figure 2. On-Resistance Vs. Gate-Source Voltage

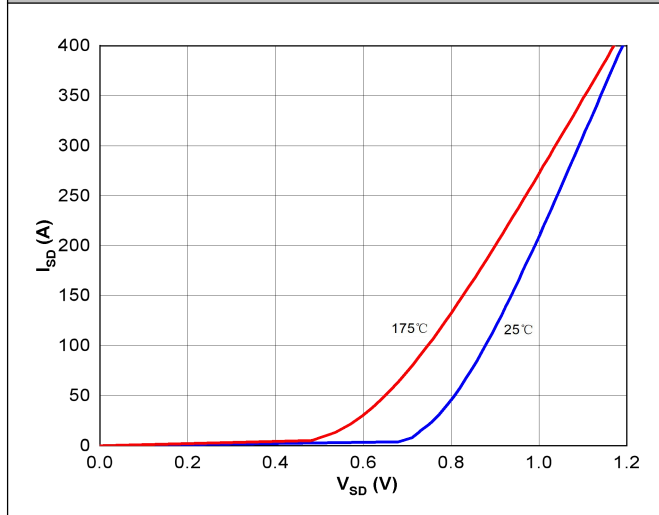


Figure 3. Forward Characteristics of Reverse

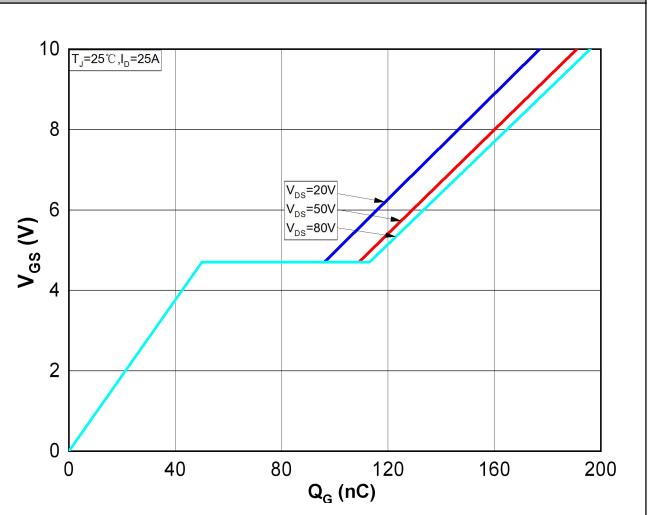


Figure 4. Gate Charge Characteristics

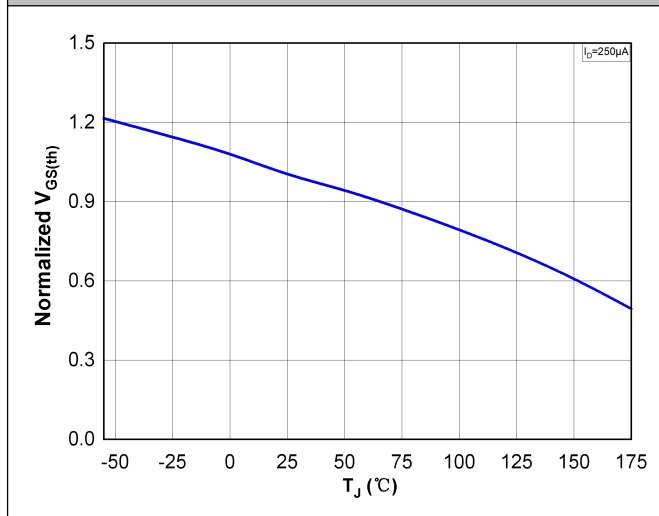


Figure 5. Normalized $V_{GS(th)}$ Vs. T_J

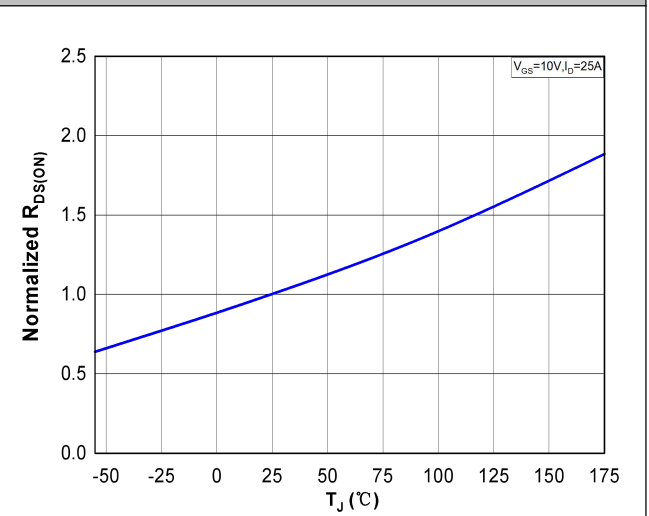


Figure 6. Normalized $R_{DS(on)}$ Vs. T_J

Typical Characteristics

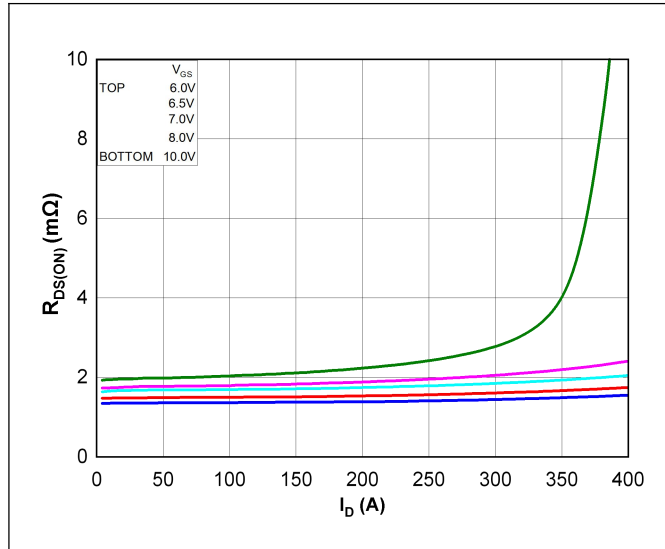


Figure 7. Drain-Source On-State Resistance

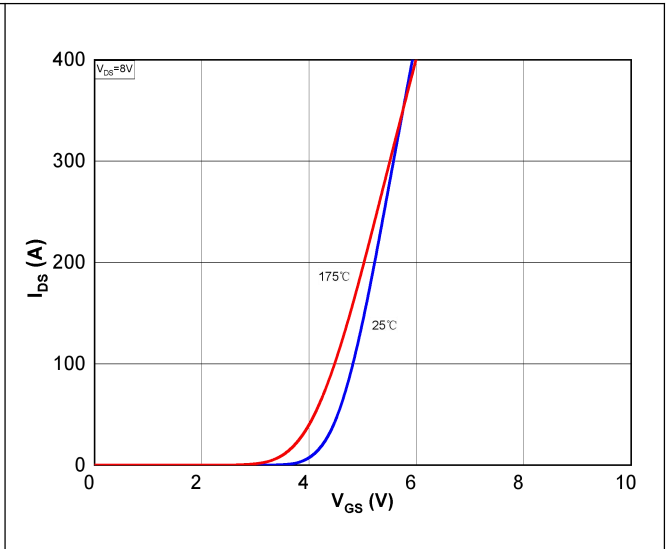


Figure 8. Transfer Characteristics

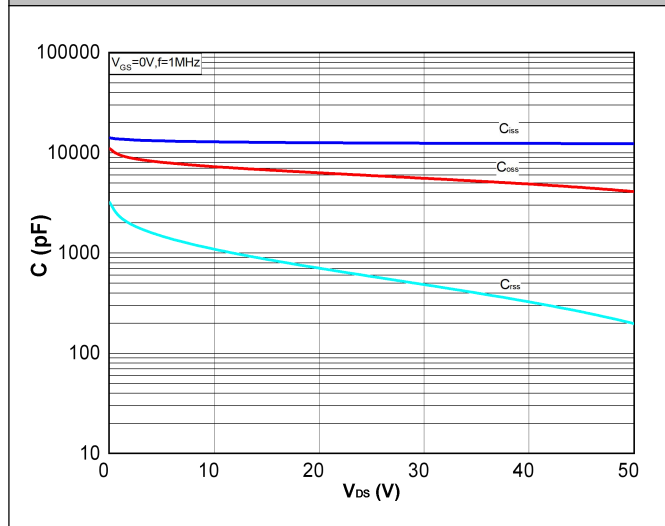


Figure 9. Capacitance

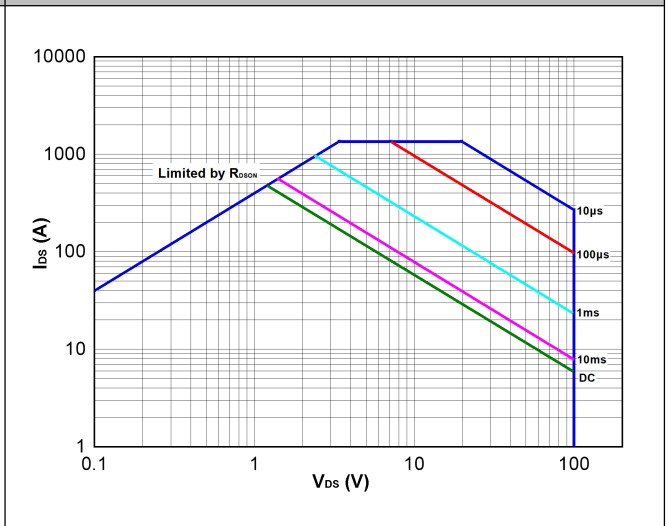


Figure 10. Safe Operating Area

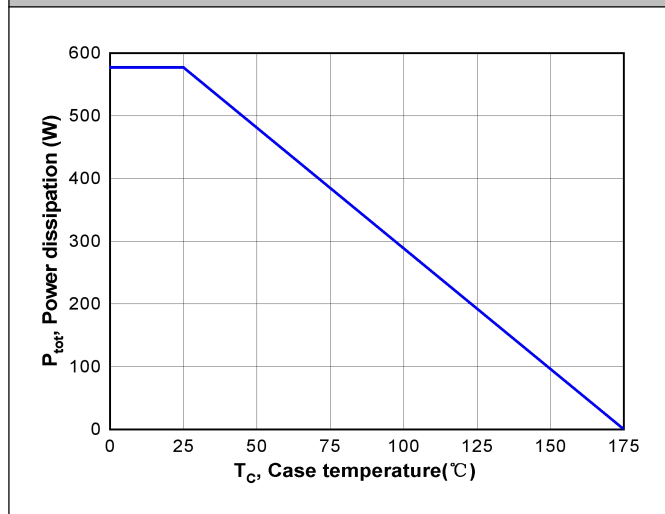


Figure 11. Power Dissipation

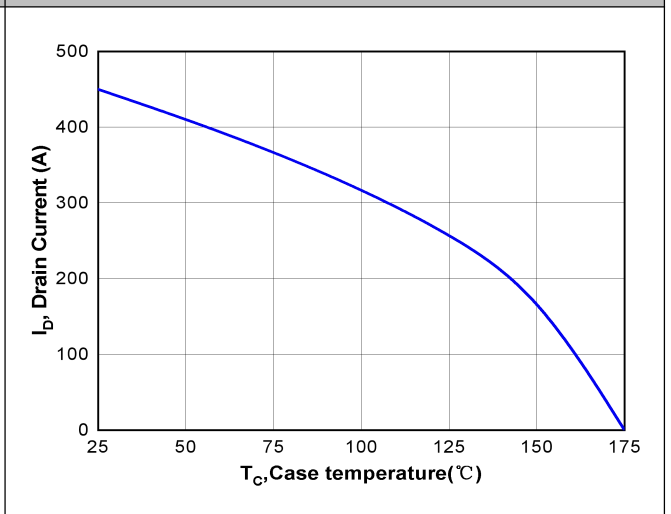


Figure 12. Drain Current

■ Typical Characteristics

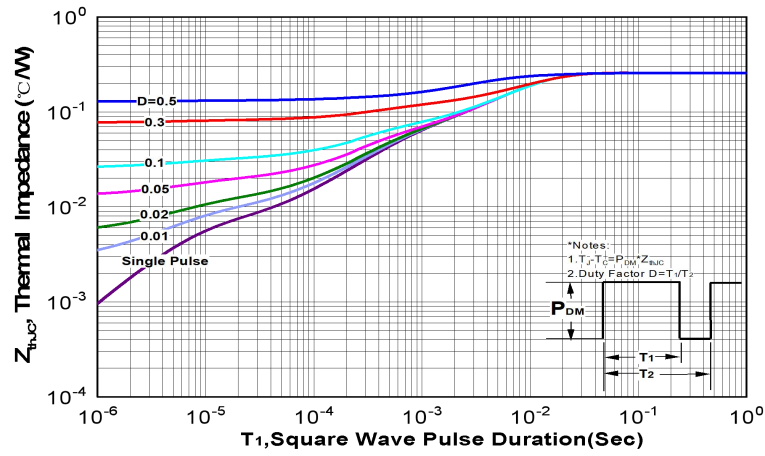
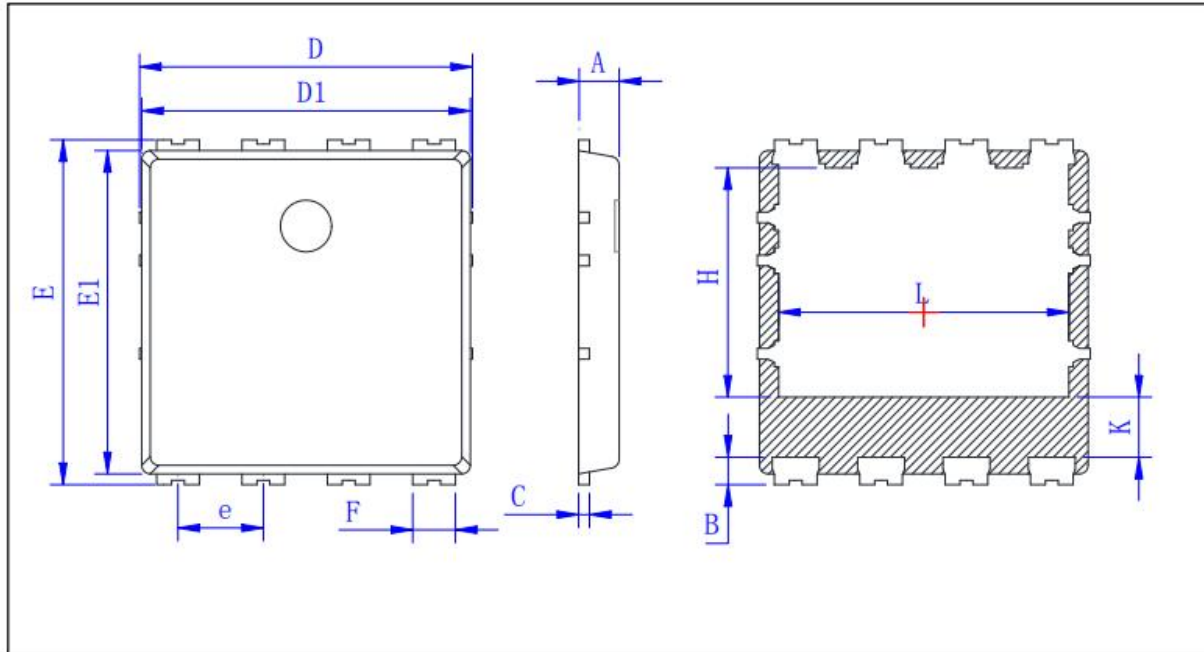


Figure 13. Transient Thermal Impedance

■ Package Information

PDFN8*8



Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.50	0.60	0.70
C	0.254 TYP		
D	7.70	7.80	7.90
D1	7.60	7.70	7.80
E	7.90	8.00	8.10
E1	7.40	7.50	7.60
e	2.0 TYP		
F	1.00 TYP		
H	5.15	5.30	5.40
L	6.60	6.80	6.90
K	1.20		