

ATM7430NDH

N-Channel Fast Switching MOSFET

Drain-Source Voltage: 30V Continuous Drain Current: 10.5A

Description

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

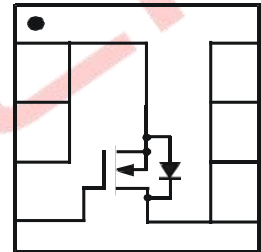
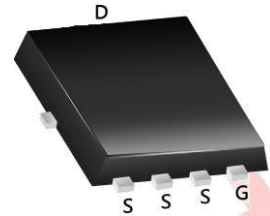
Features

- Low RDS(ON) – ensures on state losses are minimized
- Small form factor thermally efficient package enables higher density end products
- Occupies just 33% of the board area occupied by SO-8 enabling smaller end product

Mechanical Data

- Case:DFN3030
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish – NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.072 grams (approximate)

DFN3030



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units		
V_{DS}	Drain-Source Voltage	30	V		
V_{GS}	Gate-Source Voltage	± 20	V		
I_D	Continuous Drain Current (Note 2) $V_{GS} = 10V$	Steady State	$T_A=25^\circ C$	10.5	A
I_D			$T_A=70^\circ C$	8.5	A
I_D		$T < 10s$	$T_A=25^\circ C$	14	A
I_D			$T_A=70^\circ C$	11	A
I_{DM}	Pulsed Drain Current (10s pulse, duty cycle = 1%)	90	A		
I_S	Maximum Continuous Body Diode Forward Current (Note 2)	3.0	A		
EAR	Repetitive Avalanche Energy (Note 5) $L = 0.1mH$	24	mJ		
I_{AR}	Avalanche Current (Note 3) $L = 0.1mH$	22	A		
P_D	Total Power Dissipation(Note 1)	Steady State	0.9	W	
		$t \leq 10s$	1.5	W	
P_D	Total Power Dissipation(Note 2)	Steady State	2.2	W	
		$t \leq 10s$	3.5	W	
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to 150	$^\circ C$		
Symbol	Parameter	Value	Unit		
$R_{\theta JA}$	Thermal Resistance Junction-Ambient(Note 1)	Steady State	142	$^\circ C/W$	
		$t \leq 10s$	78	$^\circ C/W$	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient (Note 2)	Steady State	59	$^\circ C/W$	
		$t \leq 10s$	33	$^\circ C/W$	
$R_{\theta JC}$	Thermal Resistance Junction-Case(Note 2)	11	$^\circ C/W$		

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Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage(Note 4)	V _{GS} =0V , I _D =250uA	30	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance(Note 4)	V _{GS} =10V , I _D =20A	---	7	11	mΩ
	Static Drain-Source On-Resistance(Note 4)	V _{GS} =4.5V , I _D =20A	---	11	15	
V _{GS(th)}	Gate Threshold Voltage(Note 4)	V _{GS} =V _{DS} , I _D =250uA	1.4	---	2.5	V
I _{DSS}	Drain-Source Leakage Current(Note 4)	V _{DS} =30V , V _{GS} =0V , T _J =25°C	---	---	1	uA
I _{GSS}	Gate-Source Leakage Current(Note 4)	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
R _g	Gate Resistance(Note 5)	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	1.2	---	Ω
Q _g	Total Gate Charge (4.5V)(Note 5)	V _{DS} =15V , I _D =12A	---	12.5	---	nC
Q _g	Total Gate Charge (10V)(Note 5)		---	26.7	---	
Q _{gs}	Gate-Source Charge(Note 5)		---	3.6	---	
Q _{gd}	Gate-Drain Charge(Note 5)		---	4.4	---	
T _{d(on)}	Turn-On Delay Time(Note 5)		---	5.2	---	
Tr	Rise Time(Note 5)	V _{DD} =15V , V _{GS} =10V , R _L =1.25Ω, R _G =3Ω	---	21.2	---	ns
T _{d(off)}	Turn-Off Delay Time(Note 5)		---	22.3	---	
T _f	Fall Time(Note 5)		---	5.1	---	
C _{iss}	Input Capacitance(Note 5)	V _{DS} =15V , V _{GS} =0V , f=1MHz	---	1281	---	pF
C _{oss}	Output Capacitance(Note 5)		---	145	---	
Cr _{ss}	Reverse Transfer Capacitance(Note 5)		---	125	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage(Note 4)	V _{GS} =0V , I _s =1A , T _J =25°C	---	0.75	1.0	V
t _{rr}	Reverse Recovery Time(Note 5)	I _F =12A , di/dt=500A/μs , T _J =25°C	---	8.5	---	nS
Q _{rr}	Reverse Recovery Charge(Note 5)	T _J =25°C	---	7.0	---	nC

Note :

- 1.Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
- 2.Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
- 3.IAR and EAR rating are based on low frequency and duty cycles to keep T_J = 25°C
- 4.Short duration pulse test used to minimize self-heating effect.
- 5.Guaranteed by design. Not subject to product testing.

Typical Characteristics Curves

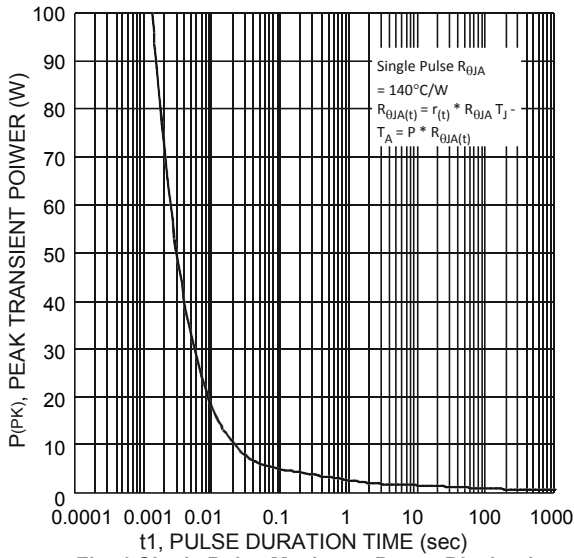


Fig. 1 Single Pulse Maximum Power Dissipation

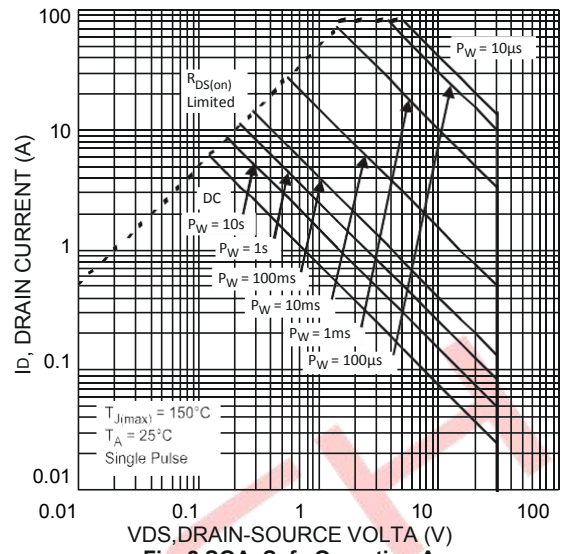


Fig. 2 SOA, Safe Operation Area

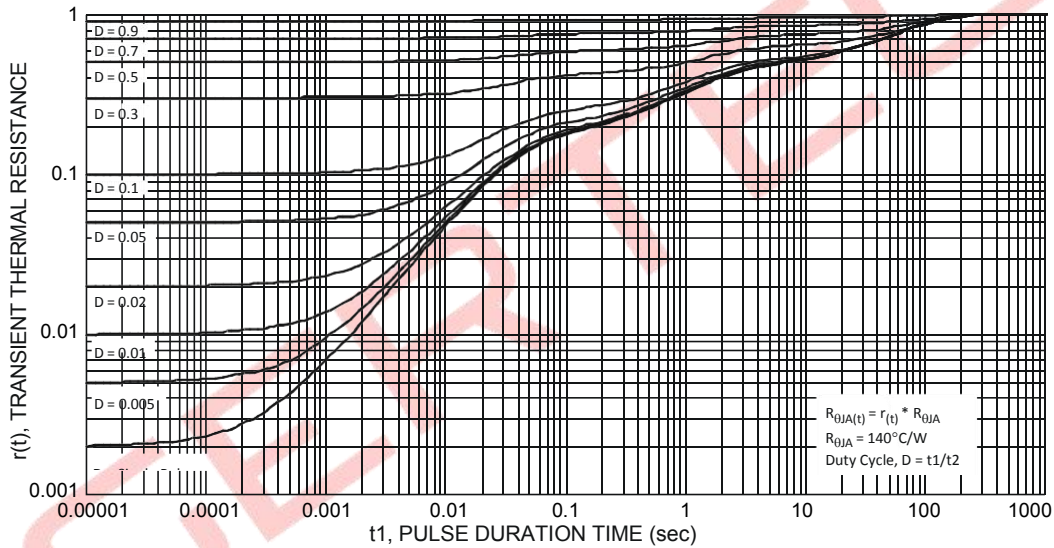


Fig. 3 Transient Thermal Resistance

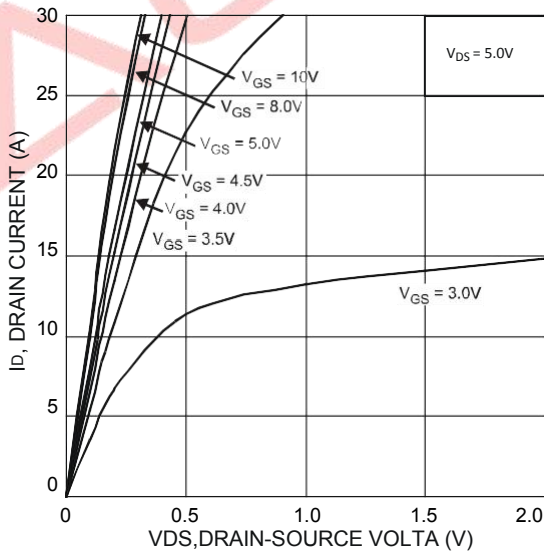


Fig. 4 Typical Output Characteristic

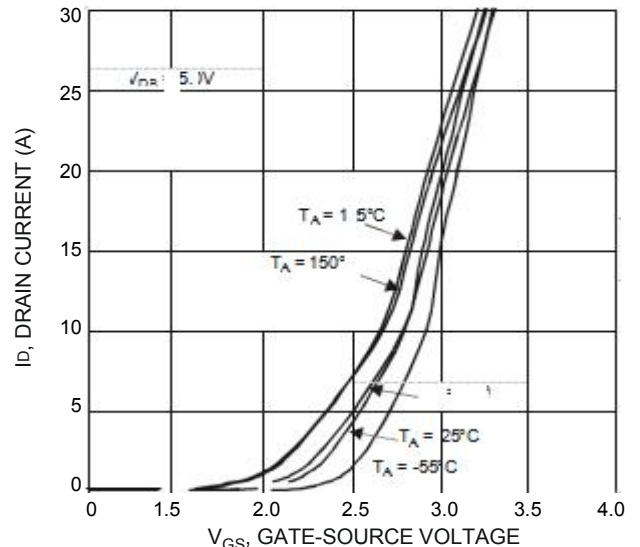


Fig. 5 Typical Transfer Characteristics

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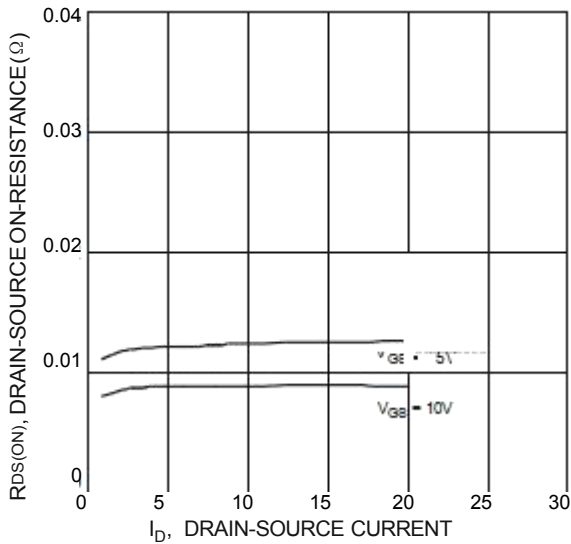


Fig. 6 Typical On-Resistance vs. Drain Current and Gate Voltage

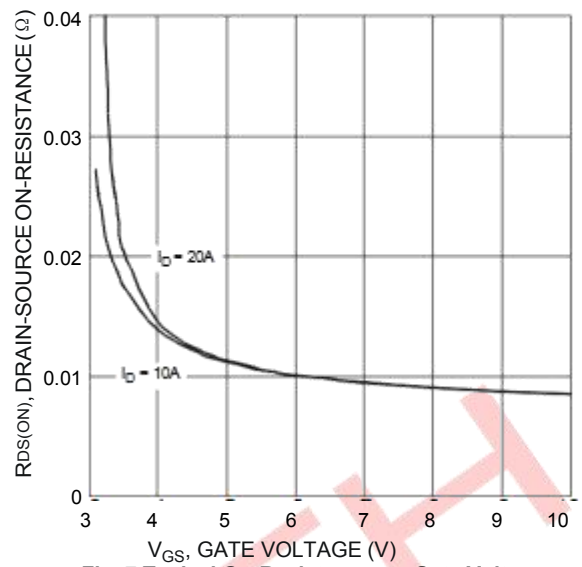


Fig. 7 Typical On-Resistance vs. Gate Voltage

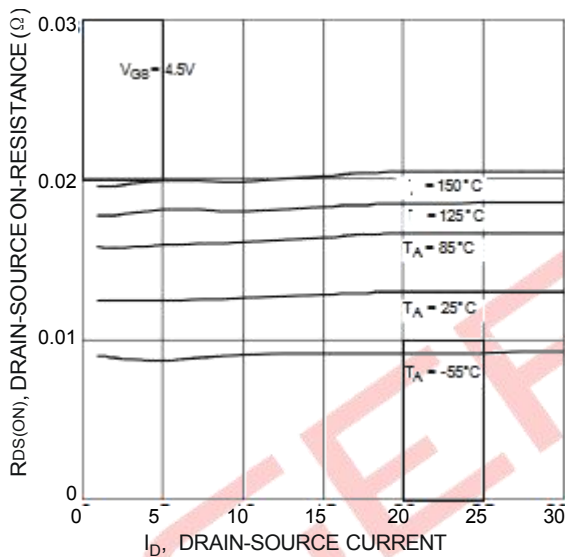


Fig. 8 Typical On-Resistance vs. Drain Current and Temperature

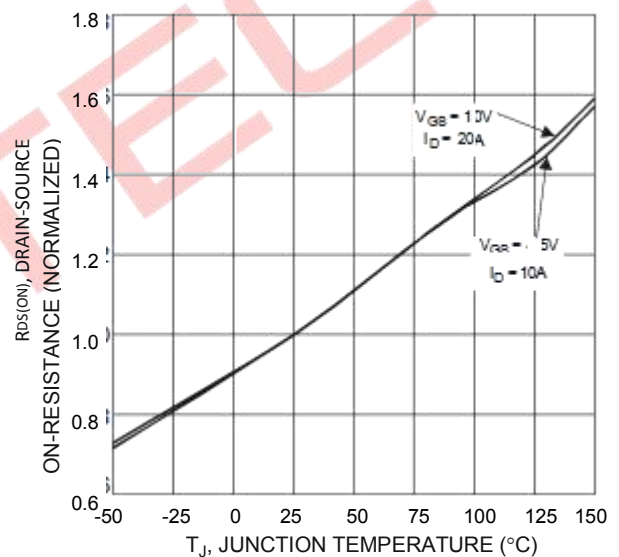


Fig. 9 On-Resistance Variation with Temperature

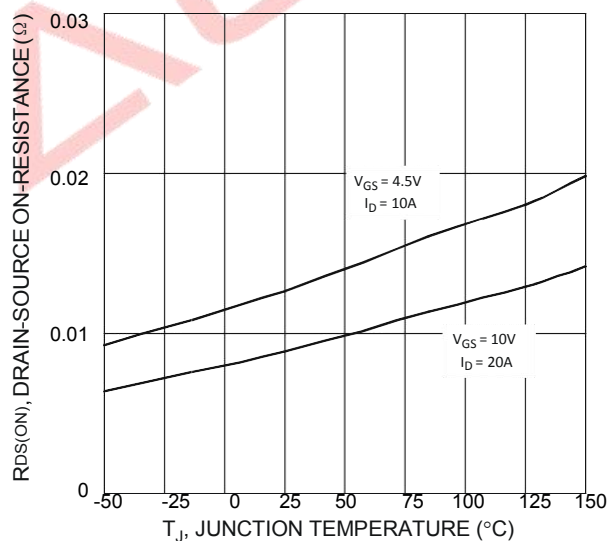


Fig. 10 On-Resistance Variation with Temperature

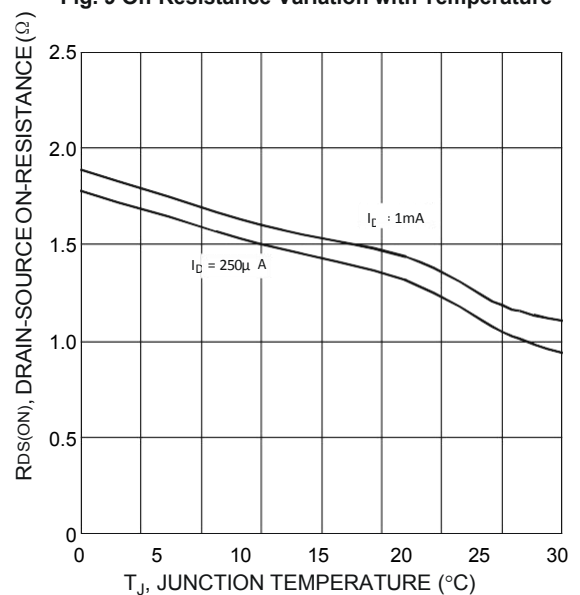
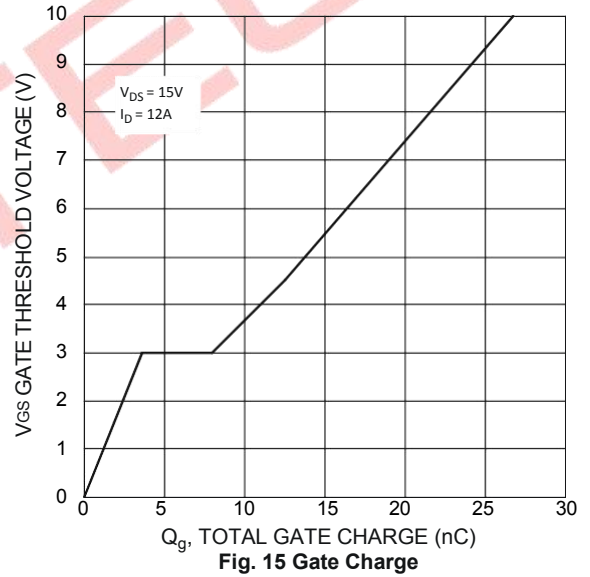
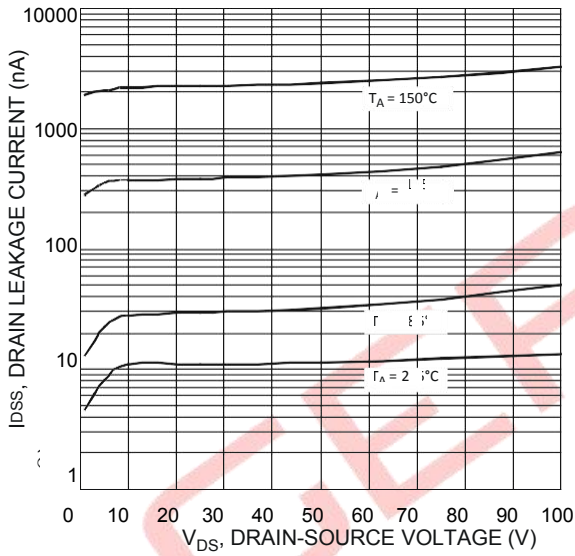
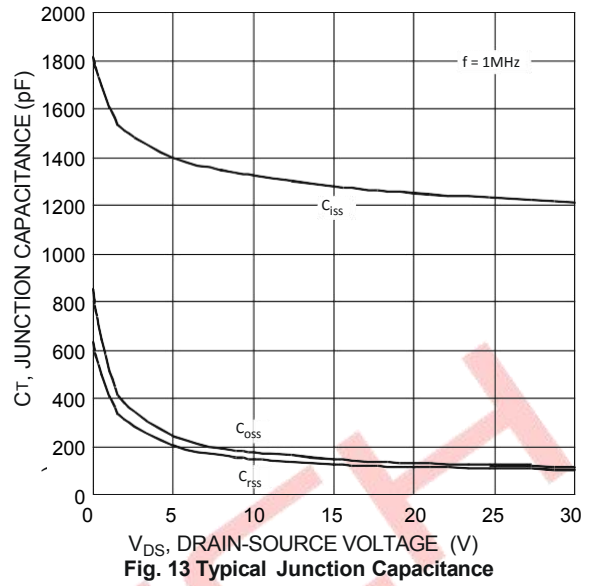
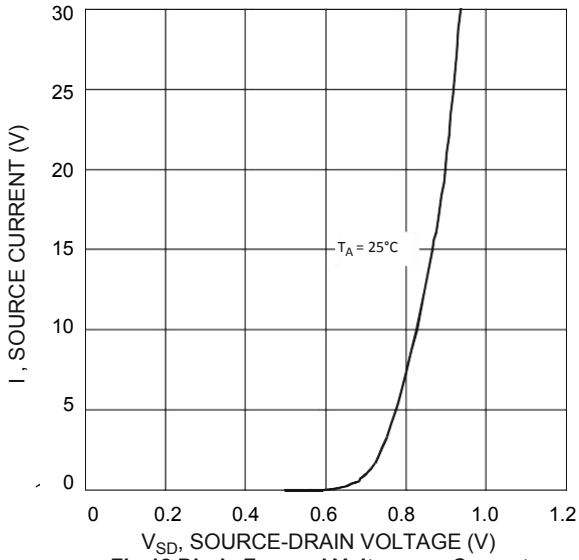


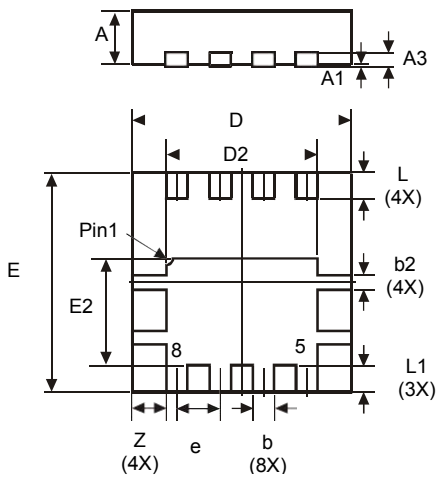
Fig. 11 Gate Threshold Variation vs. Ambient Temperature

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Package Outline Dimensions



DFN3030			
Dim	Min	Max	Typ
D	3.25	3.35	3.30
E	3.25	3.35	3.30
D2	2.22	2.32	2.27
E2	1.56	1.66	1.61
A	0.75	0.85	0.80
A1	0	0.05	0.02
A3	-	-	0.203
b	0.27	0.37	0.32
b2	-	-	0.20
L	0.35	0.45	0.40
L1	-	-	0.39
e	-	-	0.65
Z	-	-	0.515
All Dimensions in mm			