

FH8810BT4

N-Channel Enhancement Mode Power MOSFET

Descriptions

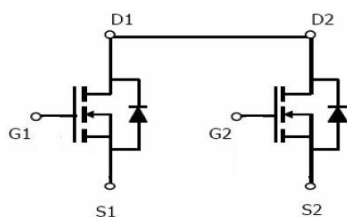
The FH8810BT4 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNMD2167 is Pb-free.

Applications

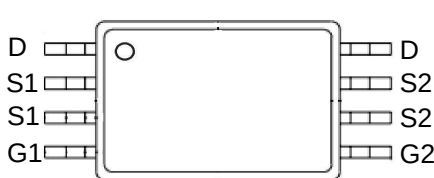
- DC-DC converter circuit
- Power Switch

General Features

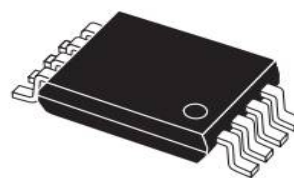
- ◆ $V_{DS} = 20V$, $I_D = 7.5A$
- $R_{DS(ON)}(Typ.) = 13.5\ m\Omega$ @ $V_{GS} = 4.5V$
- $R_{DS(ON)}(Typ.) = 17\ m\Omega$ @ $V_{GS} = 2.5V$
- ◆ High power and current handing capability
- ◆ Lead free product is acquired
- ◆ Surface mount package
- ◆ Fast Switching



Schematic diagram



Marking and pin Assignment



TSSOP-8 top view

Absolute Maximum ratings

Parameter	Symbol	10 S	Steady State	Unit
Drain-Source Voltage	V_{DS}	20		V
Gate-Source Voltage	V_{GS}	± 12		
Continuous Drain Current ^{a d}	I_D	7.5	6.2	A
		6	5	
Maximum Power Dissipation ^{a d}	P_D	1.5	1	W
		0.9	0.7	
Continuous Drain Current ^b	I_D	5.8	5.2	A
		4.6	4.1	
Maximum Power Dissipation ^b	P_D	0.9	0.7	W
		0.6	0.5	
Pulsed Drain Current ^c	I_{DM}	30		A
Operating Junction Temperature	T_J	-55 to 150		°C
Lead Temperature	T_L	260		°C
Storage Temperature Range	T_{stg}	-55 to 150		°C

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	t ≤ 10 s	R _{θJA}	76	94	°C/W
	Steady State		115	145	
Junction to Ambient Thermal Resistance ^b	t ≤ 10 s	R _{θJA}	92	115	
	Steady State		135	175	
Junction-to-Case Thermal Resistance	Steady State	R _{θJC}	63	78	
Dual Operation					
Junction to Ambient Thermal Resistance ^a	t ≤ 10 s	R _{θJA}	79	97	°C/W
	Steady State		118	148	
Junction-to-Ambient Thermal Resistance ^b	t ≤ 10 s	R _{θJA}	96	118	
	Steady State		138	180	
Junction-to-Case Thermal Resistance	Steady State	R _{θJC}	66	81	

a Surface mounted on FR -4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR -4 board using minimum pad size, 1oz copper

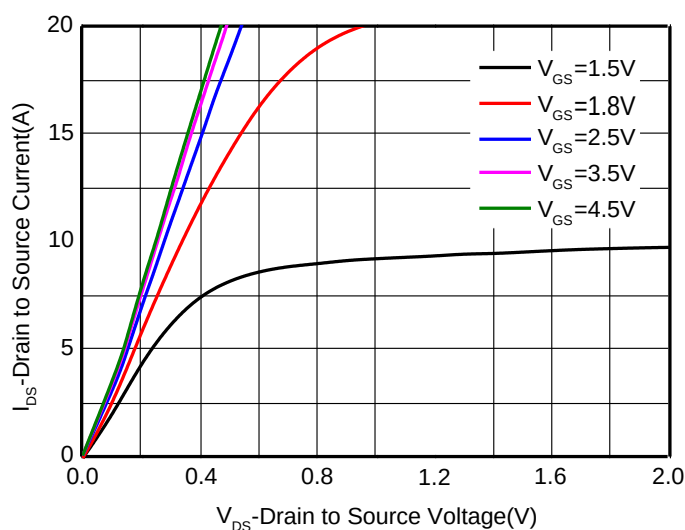
c Pulse width<380μs, Duty Cycle<2%

d Maximum junction temperature $T_J=150^{\circ}\text{C}$.

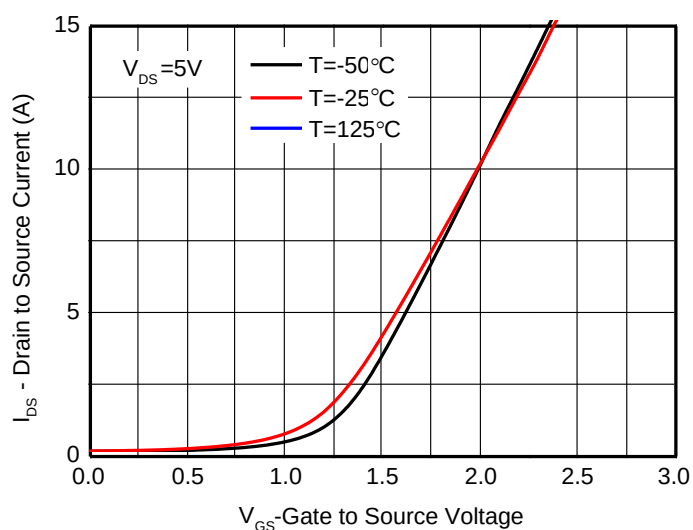
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} = 0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±12V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.45	0.7	1.0	V
Drain to source On resistance ^{b, c}	R _{DS(on)}	V _{GS} = 4.5V, I _D = 5 A	10	13.5	17	mΩ
		V _{GS} = 2.5V, I _D = 4 A	14	17	22	
Forward Transconductance	g _{FS}	V _{DS} = 5.0 V, I _D = 7.5A		16		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1MHz, V _{DS} = 10 V		870		pF
Output Capacitance	C _{OSS}			127		
Reverse Transfer Capacitance	C _{RSS}			115		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DD} = 10 V, I _D =7.5 A		10.9		nC
Threshold Gate Charge	Q _{G(TH)}			0.62		
Gate-to-Source Charge	Q _{GS}			1.92		
Gate to Drain Charge	Q _{GD}			2.0		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = 4.5 V, V _{DD} = 10 V, R _L = 2Ω, R _G =6 Ω		22		ns
Rise Time	tr			18		
Turn Off Delay Time	td(OFF)			62		
Fall Time	tf			28		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 1.0A		0.65	1.2	V

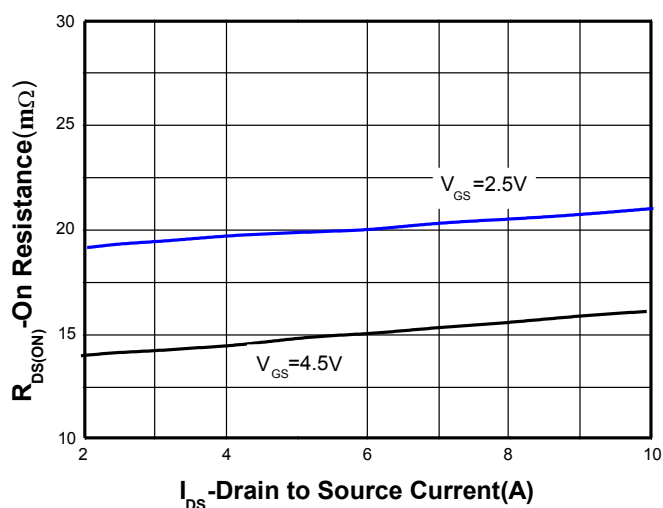
Typical Characteristics (Ta=25°C, unless otherwise noted)



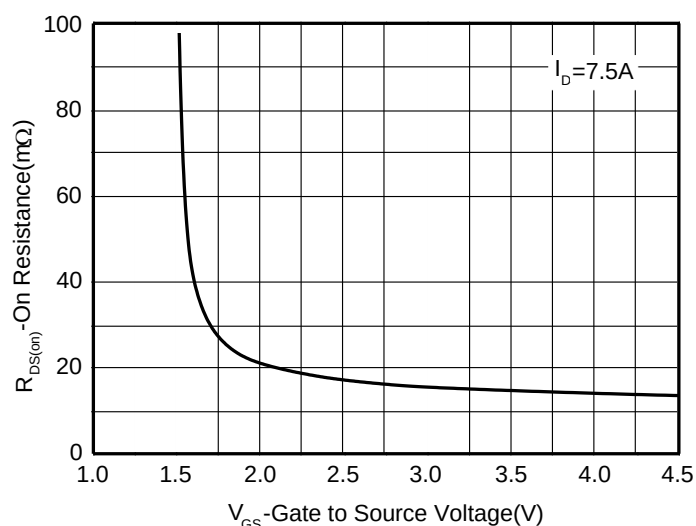
Output characteristics



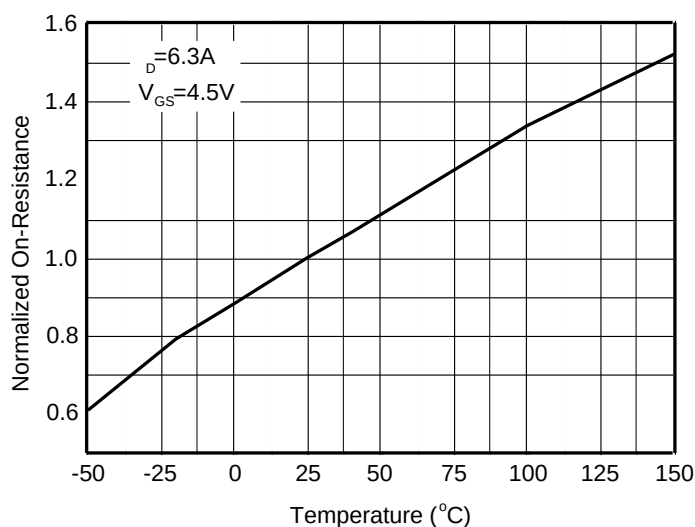
Transfer characteristics



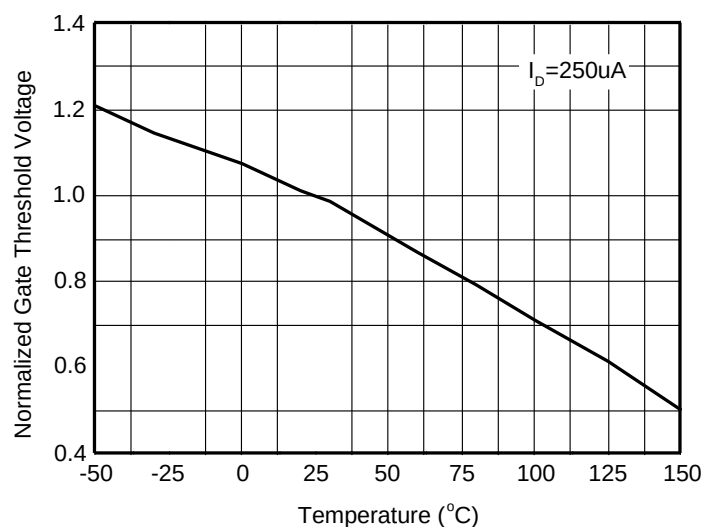
On-Resistance vs. Drain current



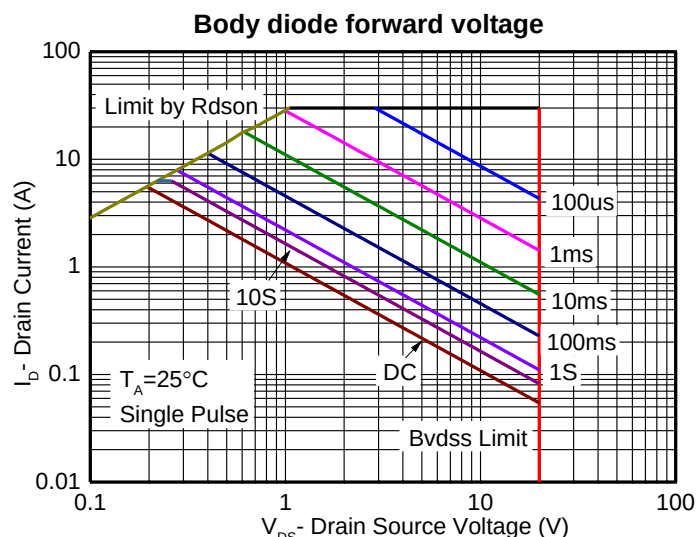
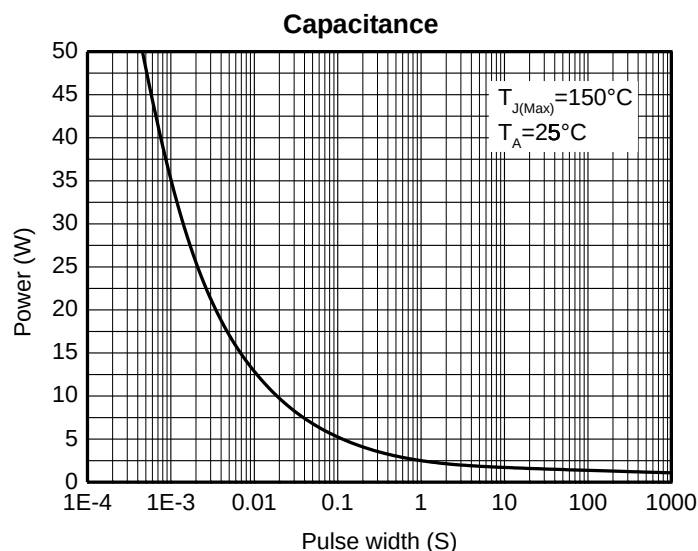
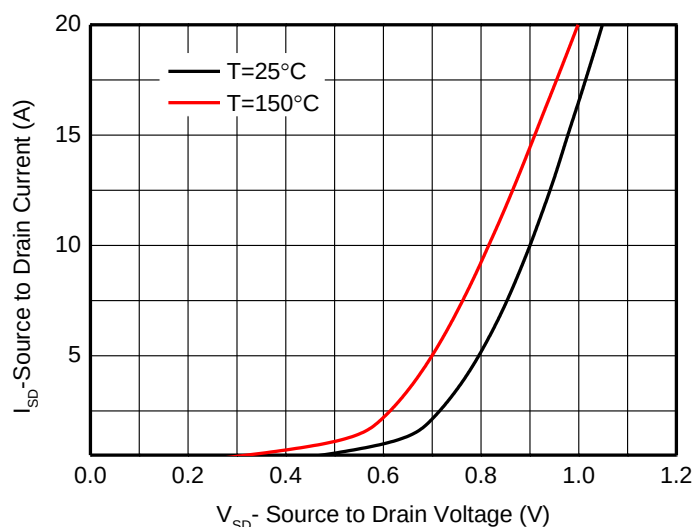
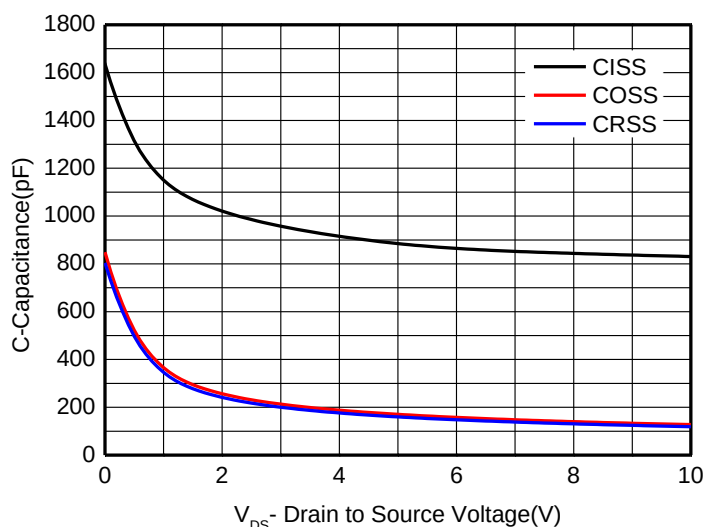
On-Resistance vs. Gate-to-Source voltage



On-Resistance vs. Junction temperature

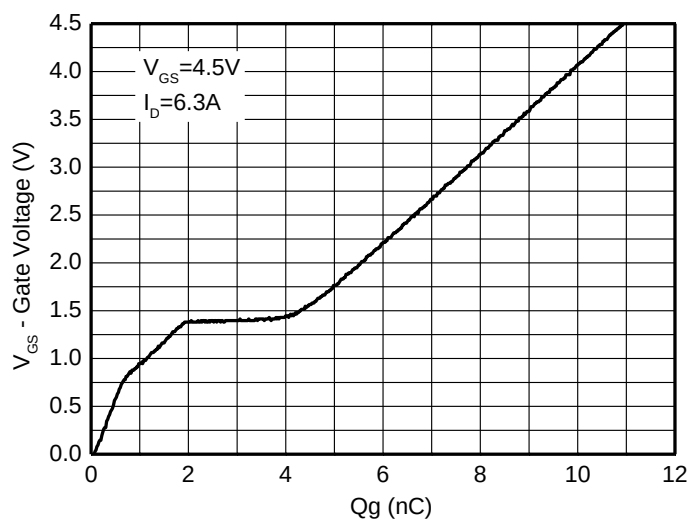


Threshold voltage vs. Temperature

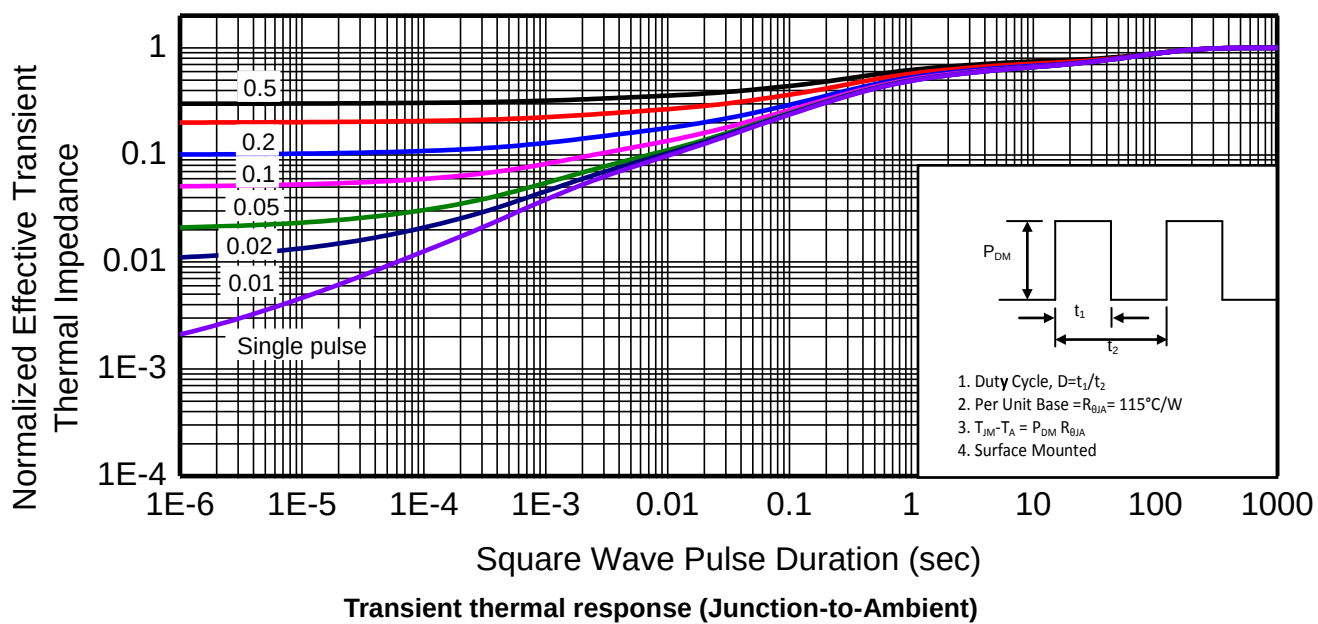


Single pulse power

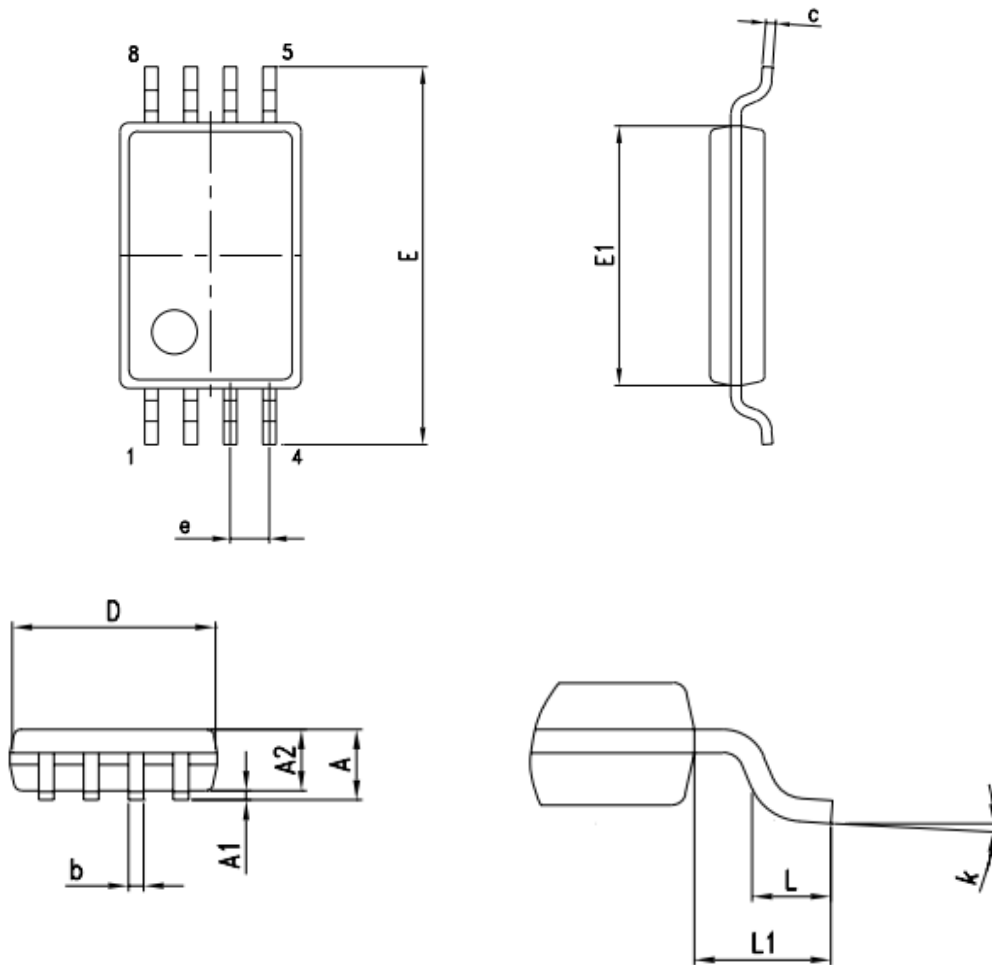
Safe operating power



Gate Charge Characteristics



Package Outline Dimensions : TSSOP-8



DIM.	mm.			inch.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.05		1.20	0.041		0.047
A1	0.05		0.15	0.002		0.006
A2	0.80		1.05	0.032		0.041
b	0.19		0.30	0.008		0.012
c	0.090		0.20	0.003		0.007
D	2.90		3.10	0.114		0.122
E	6.20		6.60	0.240		0.260
E1	4.30		4.50	0.170		0.177
e		0.65			0.025	
L	0.45		0.75	0.018		0.030
L1		1.00			0.039	
k	0°		8°	0.192		0.208