N-Channel Enhancement Mode Power MOSFET

Description

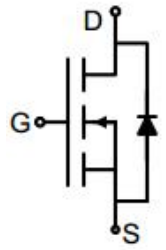
The G1K3N10G uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

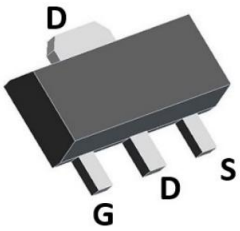
- V_{DS} 100V
- I_D (at V_{GS} = 10V) 5A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 130mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 140mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



SOT-89

Ordering Information

Device	Package	Marking	Packaging
G1K3N10G	SOT-89	G1K3N10	1000pcs/Carton

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Continuous Drain Current	T_C = 25ºC	I_D	5	A
	T_C = 100ºC		3.2	
Pulsed Drain Current (note1)		I_{DM}	20	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	1.6	W
Single pulse avalanche energy （note2）		E_{AS}	3	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient, t≤10s	R_{thJA}	78	ºC/W

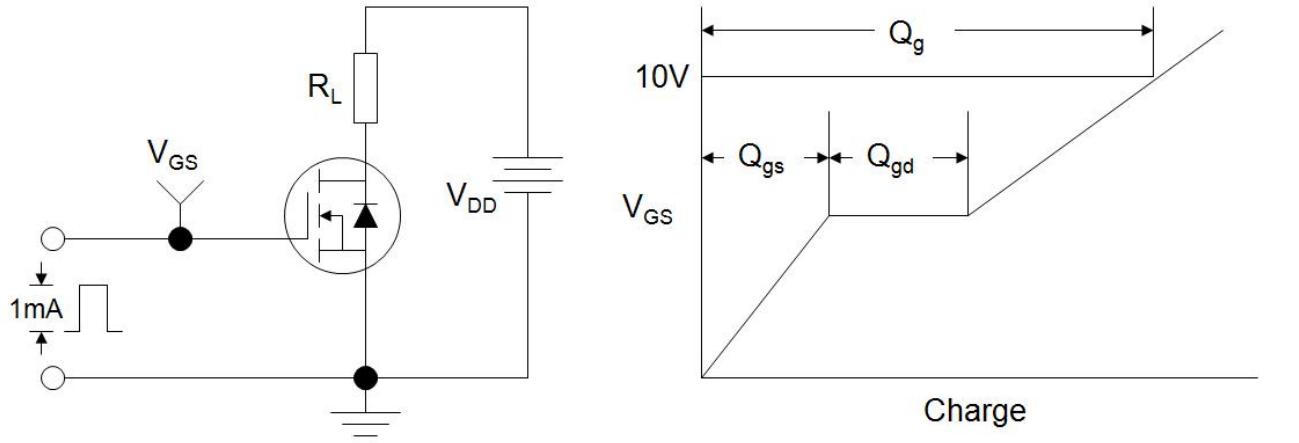
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 3A	--	105	130	mΩ
		V_{GS} = 4.5V, I_D = 3A	--	113	140	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 3A	--	8	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	800	--	pF
Output Capacitance	C_{oss}		--	21	--	
Reverse Transfer Capacitance	C_{rss}		--	19	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 3A, V_{GS} = 10V	--	19	--	nC
Gate-Source Charge	Q_{gs}		--	2	--	
Gate-Drain Charge	Q_{gd}		--	5	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 3A, R_G = 3Ω	--	6	--	ns
Turn-on Rise Time	t_r		--	4	--	
Turn-off Delay Time	$t_{d(off)}$		--	20	--	
Turn-off Fall Time	t_f		--	4	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	5	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 3A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 3A, V_{GS} = 0V di/dt=100A/us	--	11	--	nC
Reverse Recovery Time	Trr		--	22	--	ns

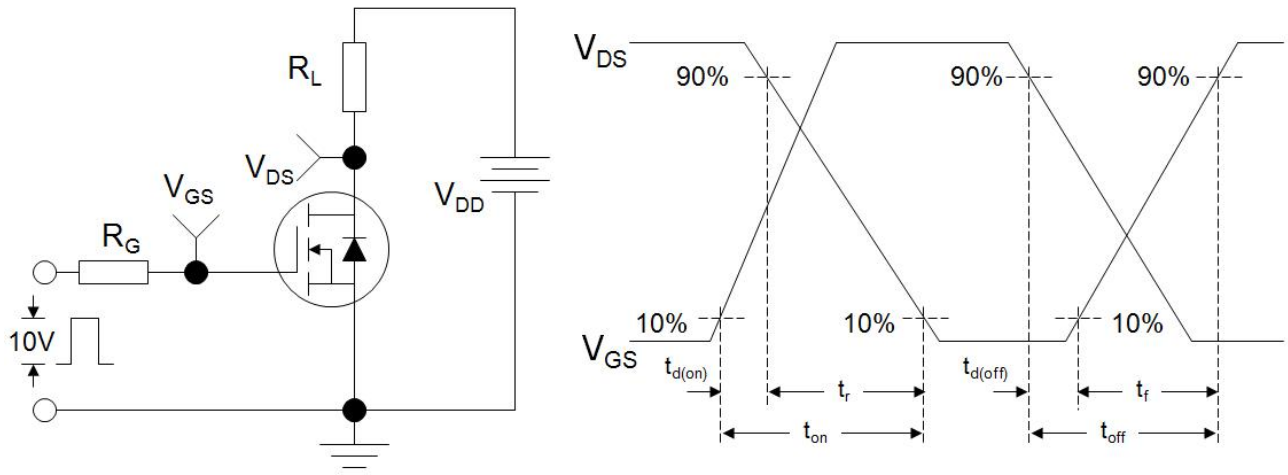
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω
   The table shows the minimum avalanche energy, which is 8mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

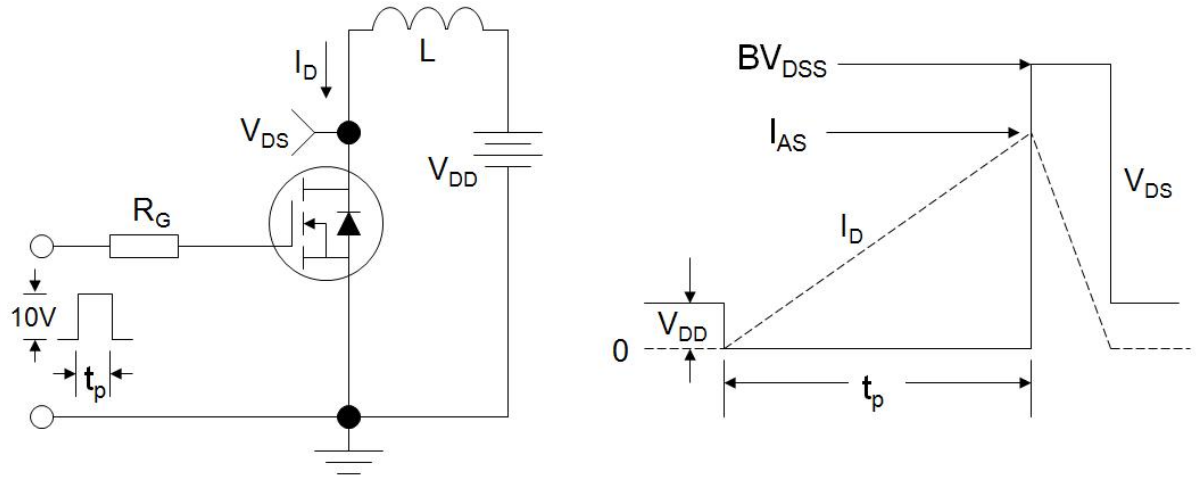
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

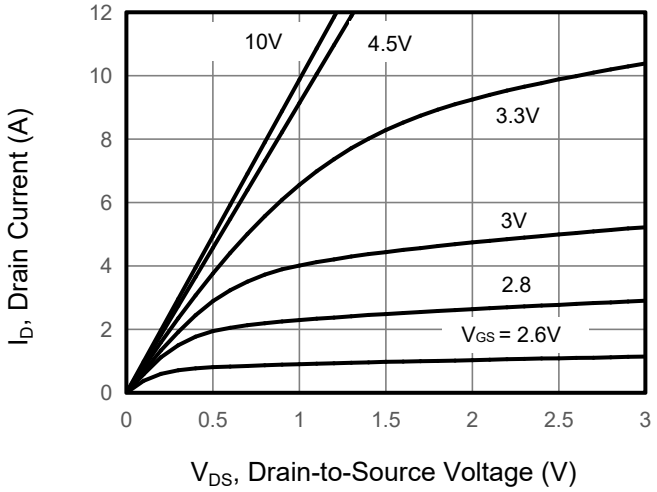


Figure 2. Transfer Characteristics

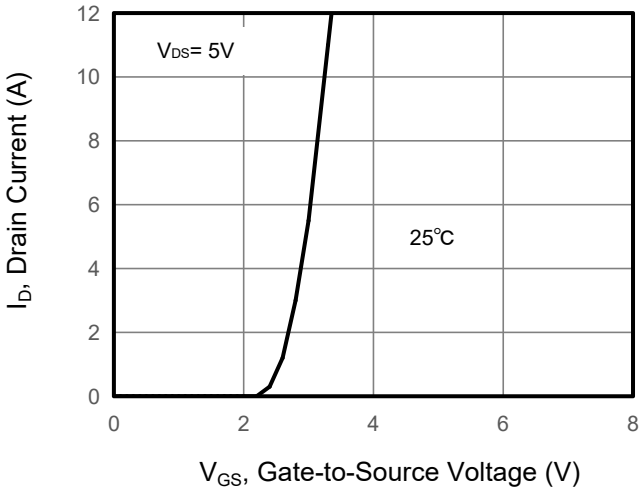


Figure 3. Drain Source On Resistance

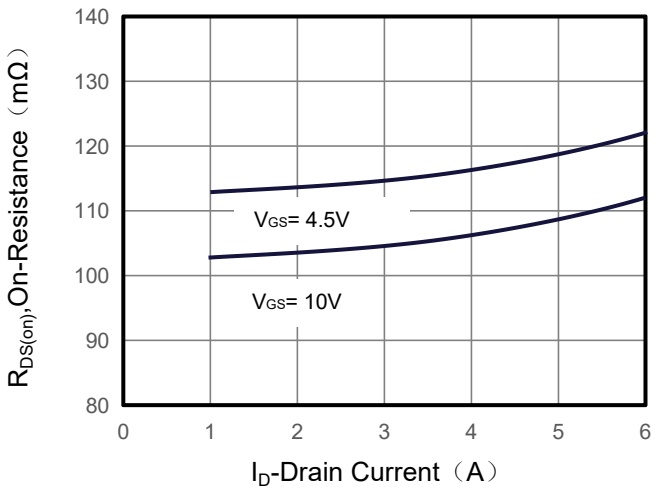


Figure 4. Gate Charge

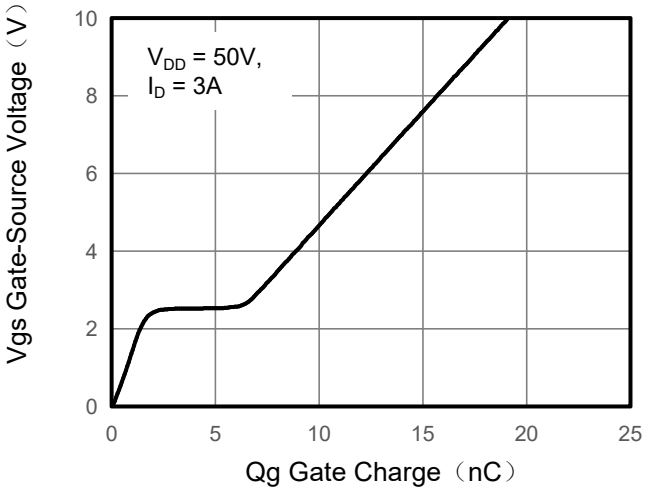


Figure 5. Capacitance

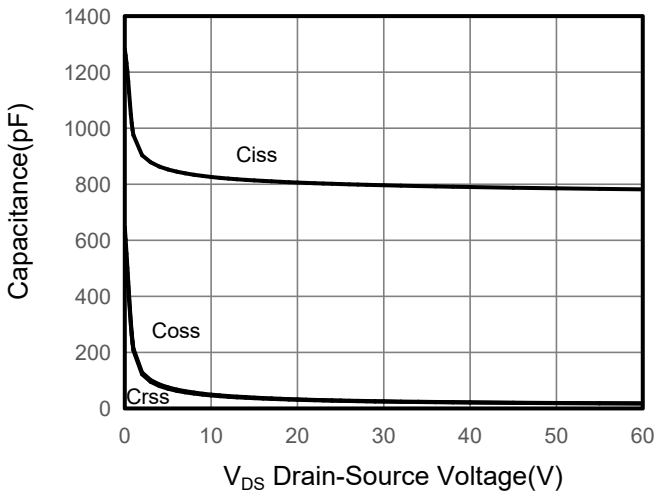
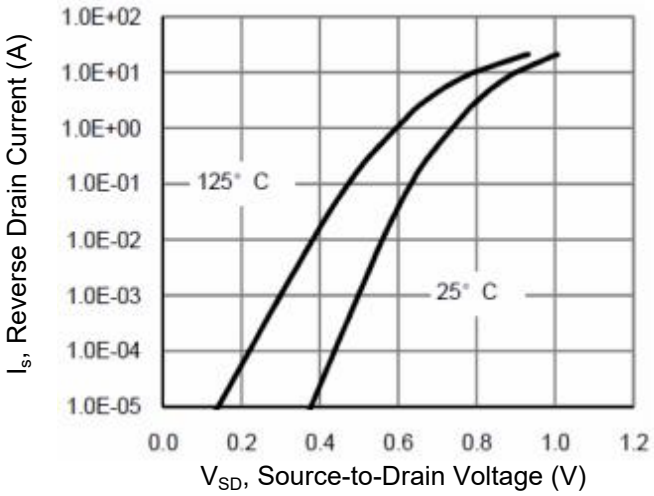


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

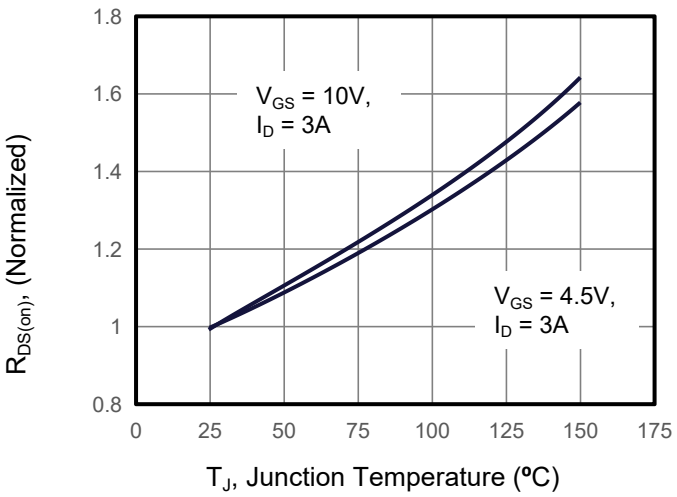


Figure 8. Safe Operation Area

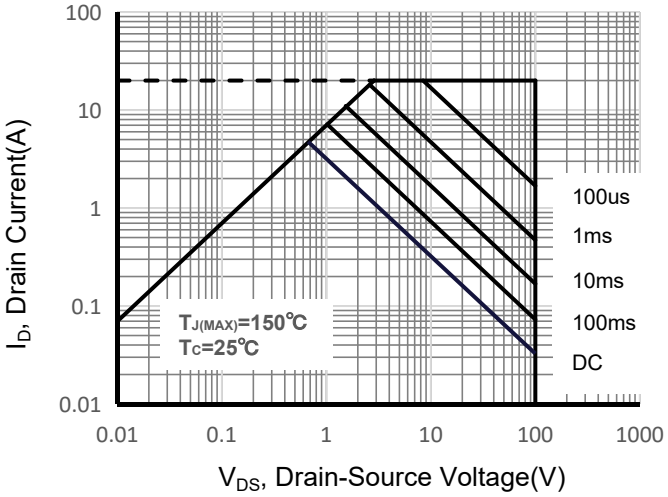


Figure 9. Maximum Continuous Drain Current vs Case Temperature

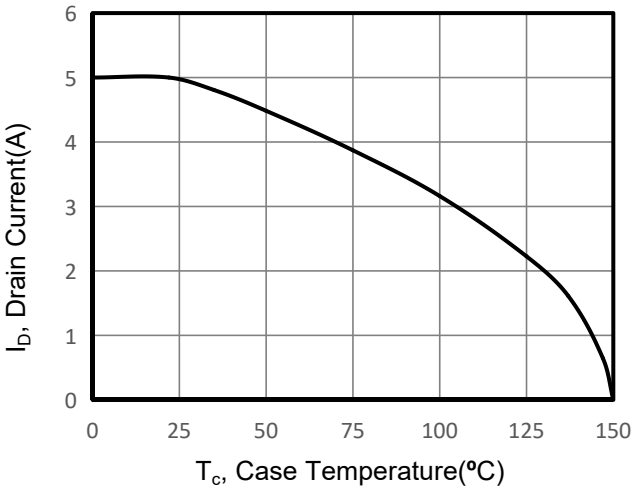
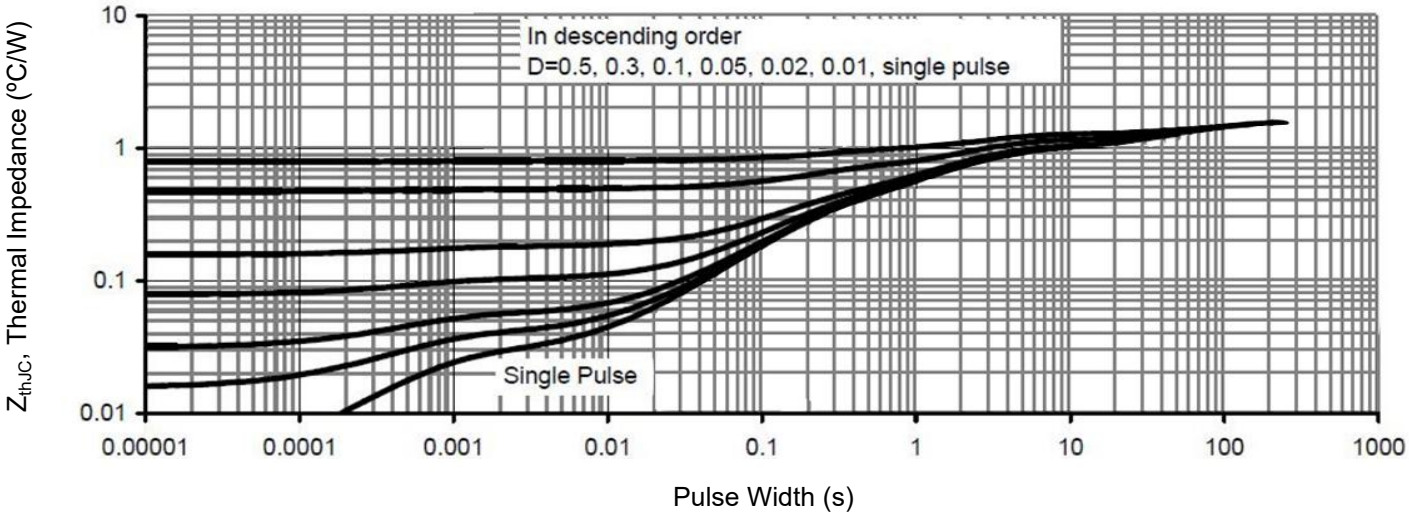
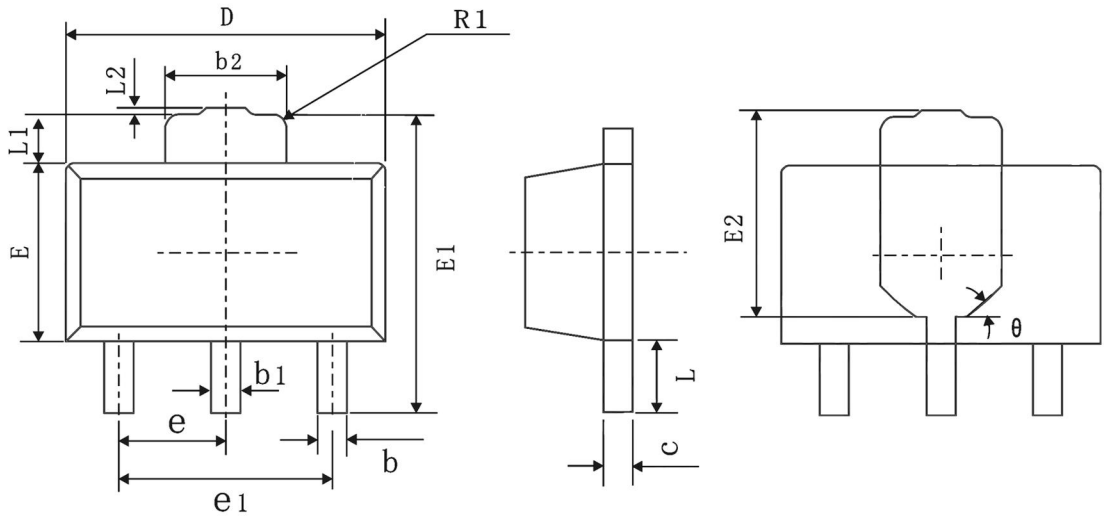


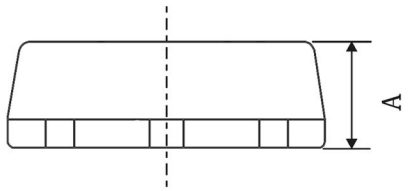
Figure 10. Normalized Maximum Transient Thermal Impedance



SOT-89 Package Information



TOP VIEW　　SIDE VIEW　　BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	1.40	1.50	1.60
b	0.36	0.40	0.50
b1	0.44	0.48	0.58
b2	1.60	1.70	1.80
c	0.35	0.40	0.45
D	4.40	4.50	4.60
E	2.40	2.50	2.60
E1	4.00	4.20	4.40
E2	2.65	2.85	3.05
e1	2.80	3.00	3.20
L	0.90	1.00	1.10
L1	0.60	0.70	0.80
L2	0.075 REF		
R1	0.2 BSC		
θ	45° TYP		
e	1.5 BSC		