

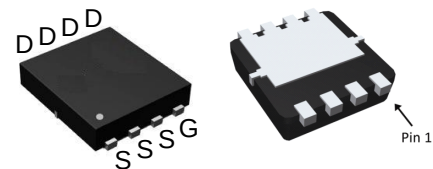
Features

- 60V/-31A
 $R_{DS(ON)}=25m\Omega(\text{typ.})@V_{GS}=-10V$
 $R_{DS(ON)}=31m\Omega(\text{typ.})@V_{GS}=-4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

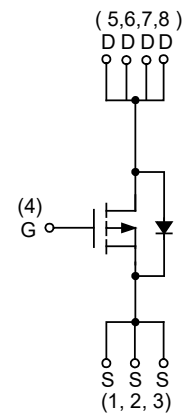
Applications

- DC/DC Converter.
- Power Management.
- Load Switch.
- For Motor Drive Application.

Pin Description



DFN3x3A-8_EP



P-Channel MOSFET

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		-60	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _C =25°C	-31	A
I _D	Continuous Drain Current	T _C =25°C	-31	A
		T _C =100°C	-23.4	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	-93	
P _D	Maximum Power Dissipation	T _C =25°C	54.3	W
		T _C =100°C	21.7	
R _{θJC}	Thermal Resistance-Junction to Case	Steady state	2.3	°C/W
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	Steady state	65	°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.5mH	-34	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.5mH	289	mJ

Note a : Pulse width limited by maximum junction temperature.

Note b : Surface Mounted on 1in^2 pad area.

Note c : UIS tested and pulse width limited by maximum junction temperature (initial temperature $T_J=25^{\circ}\text{C}$).

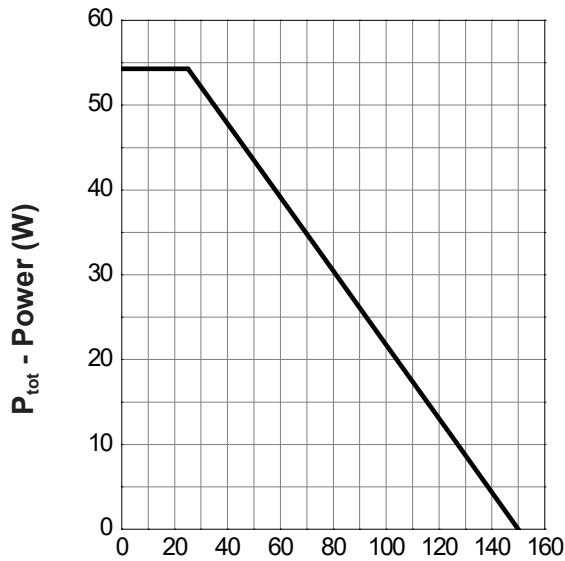
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

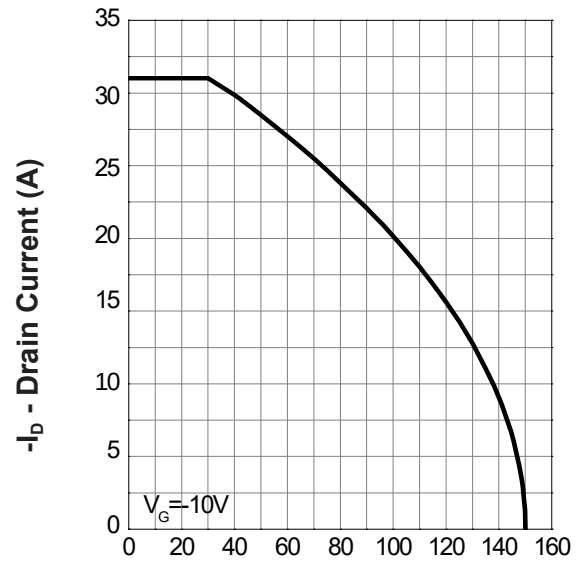
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-48V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.0	-1.8	-2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-13A	-	25	30	mΩ
		V _{GS} =-4.5V, I _{DS} =-8A	-	31	40	
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =-6A, V _{GS} =0V	-	-0.8	-1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-13A, dI _{SD} /dt=100A/μs	-	29	-	ns
Q _{rr}	Reverse Recovery Charge		-	34	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-30V, Frequency=1.0MHz	-	4016	4840	pF
C _{oss}	Output Capacitance		-	142	-	
C _{rss}	Reverse Transfer Capacitance		-	105	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-30V, R _L =-30Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	11	20	ns
t _r	Turn-on Rise Time		-	8	14	
t _{d(OFF)}	Turn-off Delay Time		-	90	162	
t _f	Turn-off Fall Time		-	43	77	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =-30V, V _{GS} =-10V, I _{DS} =-13A	-	32	48	nC
Q _{gs}	Gate-Source Charge		-	4.4	-	
Q _{gd}	Gate-Drain Charge		-	7.6	-	

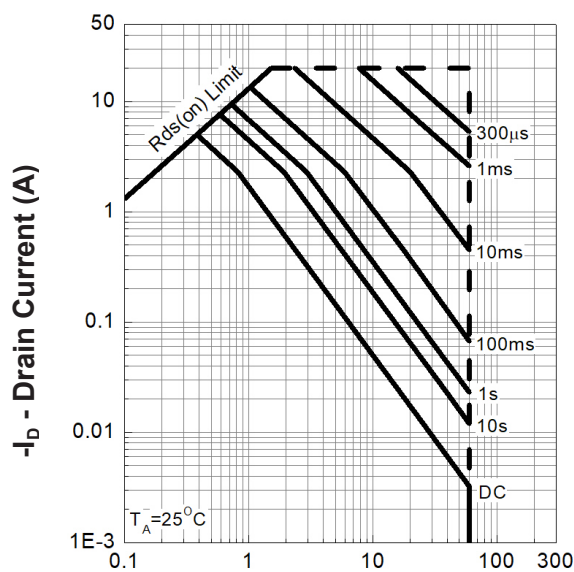
Note d : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

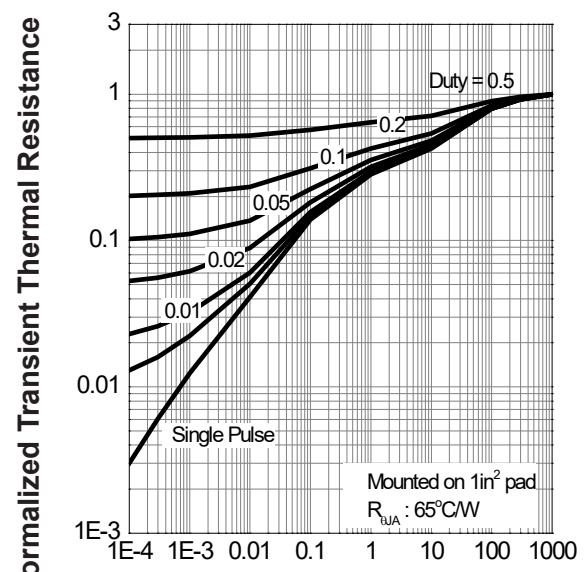
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

Power Dissipation

 T_c - Case Temperature (°C)

Drain Current

 T_c - Case Temperature (°C)

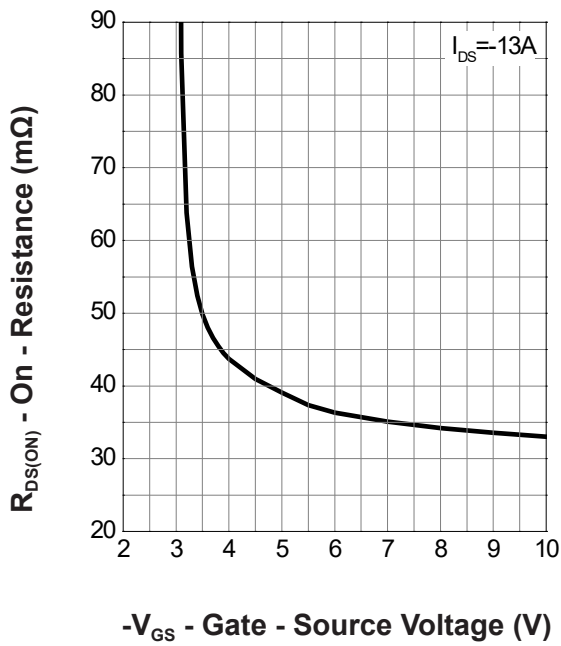
Safe Operation Area

 $-V_{DS}$ - Drain - Source Voltage (V)

Thermal Transient Impedance


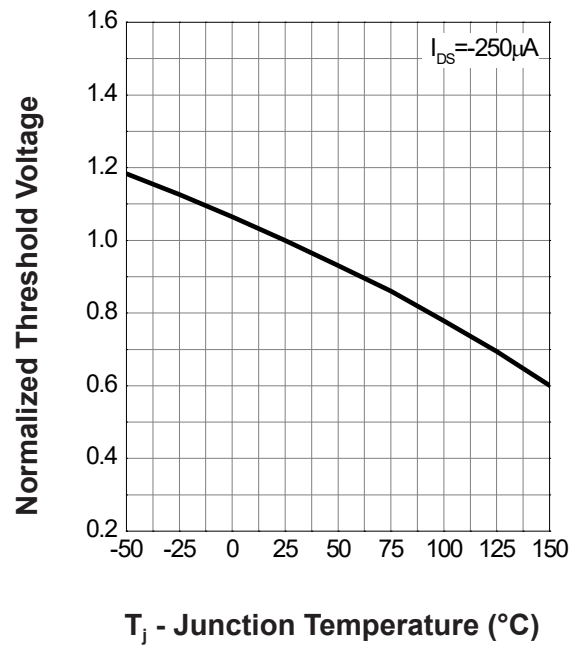
Square Wave Pulse Duration (sec)

Typical Operating Characteristics(Cont.)

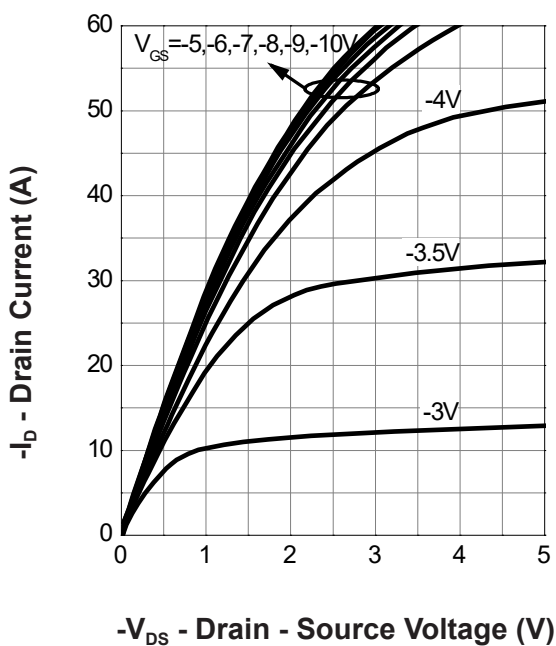
Gate-Source On Resistance



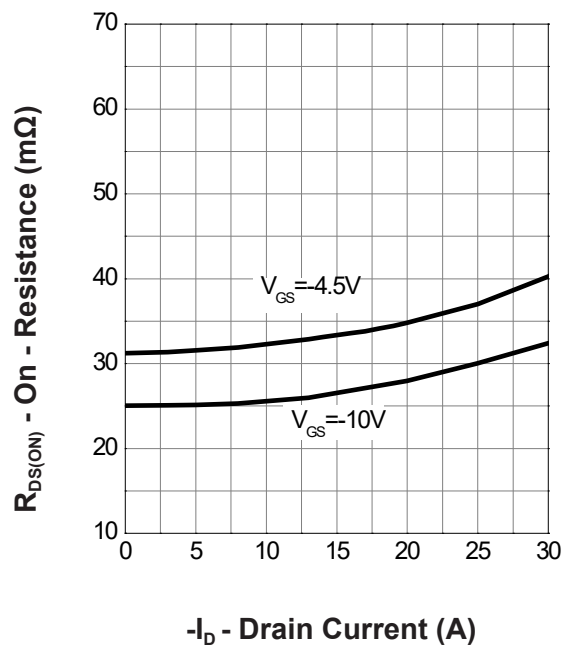
Gate Threshold Voltage



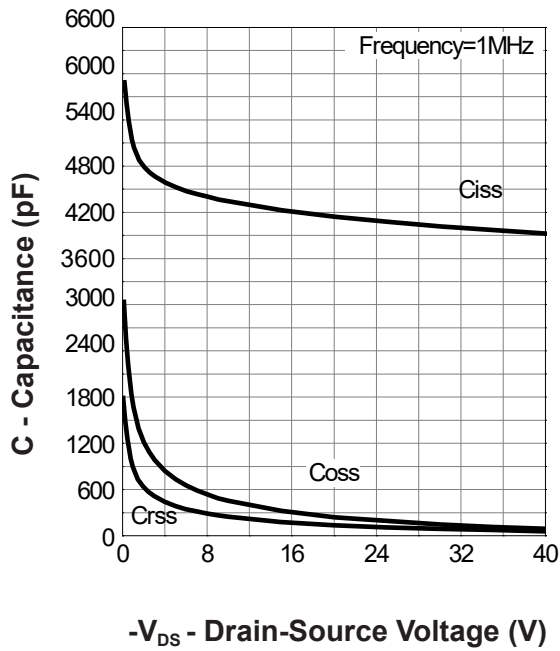
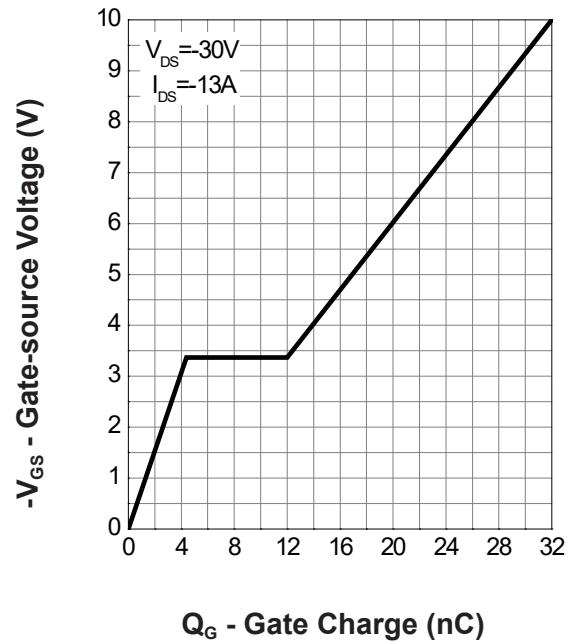
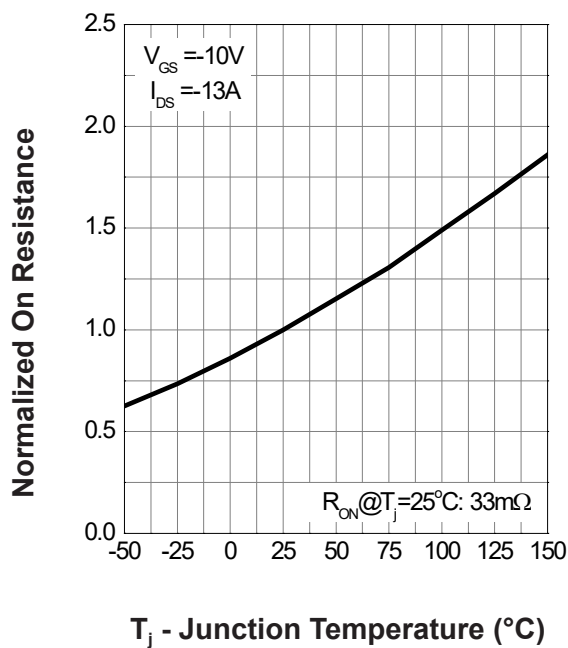
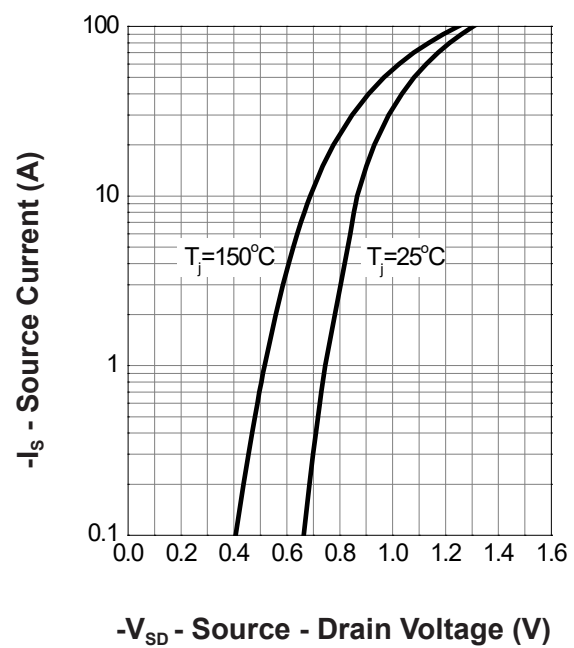
Output Characteristics



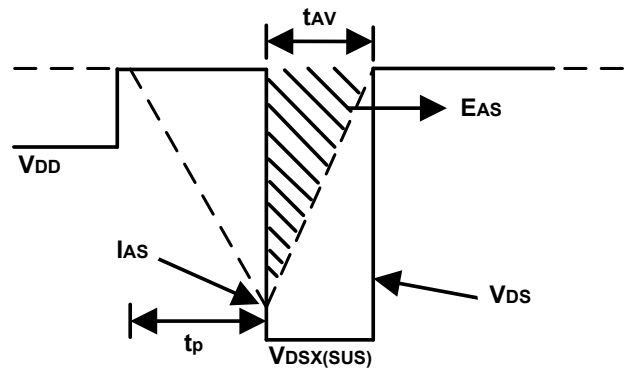
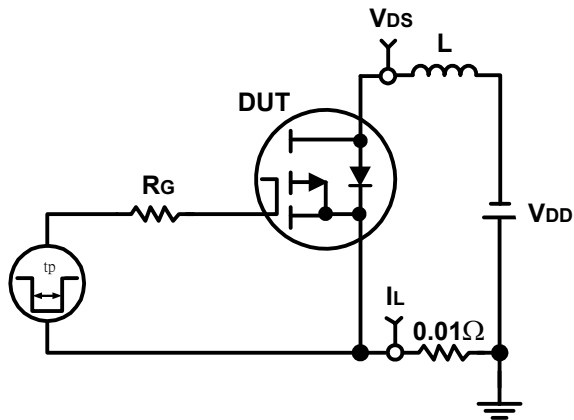
Drain-Source On Resistance



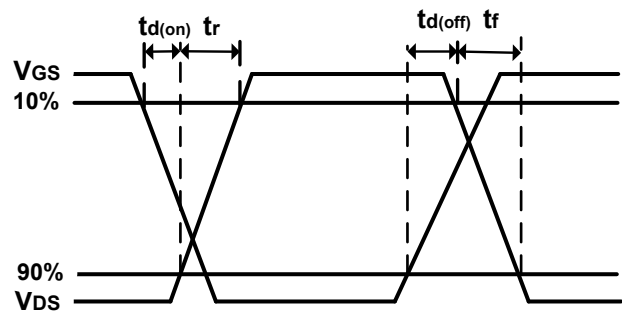
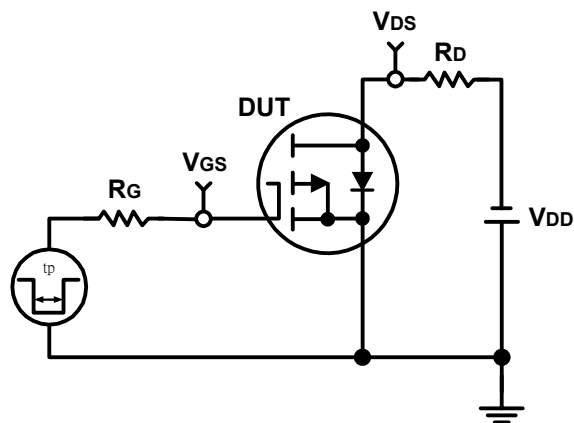
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

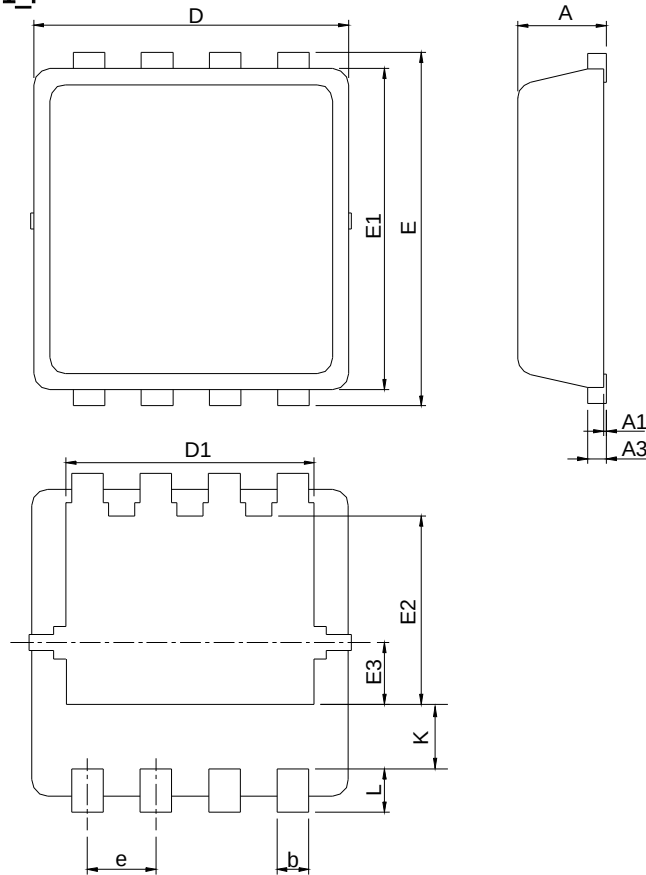


Switching Time Test Circuit and Waveforms



Package Information

DFN3.3x3.3_8L_EP1_P



SYMBOL	DFN3x3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.80	1.00	0.031	0.039
A1	0.00	0.05	0.000	0.002
A3	0.10	0.25	0.004	0.010
b	0.24	0.35	0.009	0.014
D	2.90	3.10	0.114	0.122
D1	2.25	2.45	0.089	0.096
E	3.10	3.30	0.122	0.130
E1	2.90	3.10	0.114	0.122
E2	1.65	1.85	0.065	0.073
E3	0.56	0.58	0.022	0.023
e	0.65 BSC		0.026 BSC	
K	0.475	0.775	0.019	0.031
L	0.30	0.50	0.012	0.020

RECOMMENDED LAND PATTERN

