

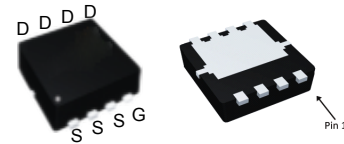
Features

- 40V/40A,
 $R_{DS(ON)} = 10m\Omega(\text{typ.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 13m\Omega(\text{typ.}) @ V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Lower Q_g and Q_{gd} for high-speed switching
- Lead Free and Green Devices Available
(RoHS Compliant)
- Moisture Sensitivity Level MSL1
(per JEDEC J-STD-020D)

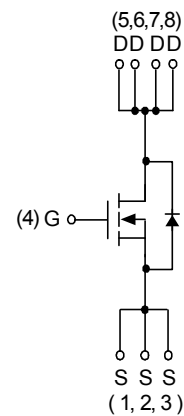
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description



PDFN3.3x3.3-8L



N-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		40	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	40	A
I _D	Continuous Drain Current	T _C =25°C	40	
		T _C =100°C	24	
I _{DM}	Pulsed Drain Current	T _C =25°C	120	
P _D	Maximum Power Dissipation	T _C =25°C	27.8	W
		T _C =100°C	11.1	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	4.5	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	40	°C/W
		Steady State ^b	60	
I _{AS} ^c	Avalanche Current, Single pulse	L=0.1mH	19	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.1mH	18	mJ

Note a : Pulse width is limited by maximum junction temperature.

Note b : $R_{\theta JA}$ steady state $t = 100\text{s}$. $R_{\theta JA}$ is measured with the device mounted on 1in^2 , FR-4 board with 2oz. Copper.

Note c : UIS tested and pulse width is limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

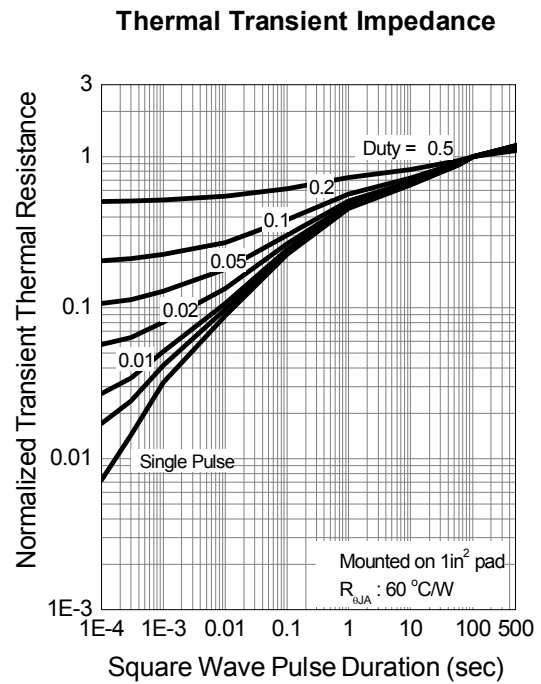
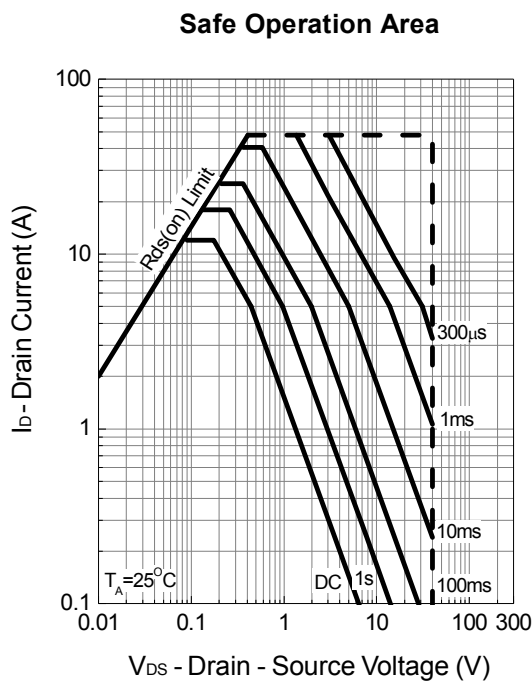
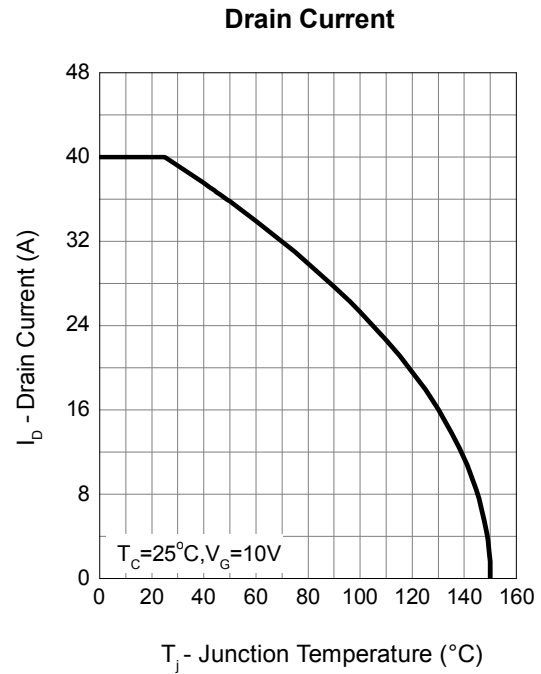
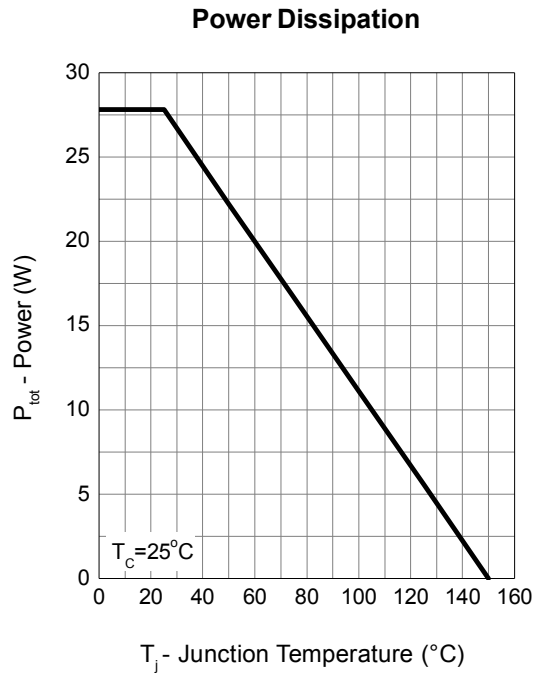
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V T _J =85°C	- -	- -	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.4	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} =15A T _J =125°C V _{GS} =4.5V, I _{DS} =8A	- - -	10 13.8 13	13 - 16.5	mΩ
G _{fs}	Forward Transconductance	V _{DS} =5V, I _{DS} =8A	-	18	-	S
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.82	1.1	V
t _{rr}	Reverse Recovery Time	I _F =5A, dI _{SD} /dt=100A/μs	-	18.8	-	ns
t _a	Charge Time		-	10.8	-	
t _b	Discharge Time		-	7.9	-	
Q _{rr}	Reverse Recovery Charge		-	10.5	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.7	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	700	-	pF
C _{oss}	Output Capacitance		-	191	-	
C _{rss}	Reverse Transfer Capacitance		-	30	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	10	-	ns
t _r	Turn-on Rise Time		-	6.6	-	
t _{d(OFF)}	Turn-off Delay Time		-	18	-	
t _f	Turn-off Fall Time		-	12	-	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =15A	-	10.7	-	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =15A	-	5.1	-	
Q _{gth}	Threshold Gate Charge		-	1.55	-	
Q _{gs}	Gate-Source Charge		-	2.9	-	
Q _{gd}	Gate-Drain Charge		-	1.1	-	

Note d : Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.

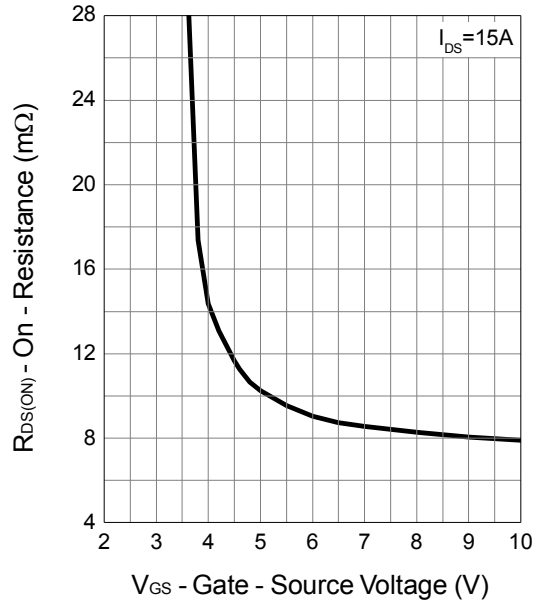
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

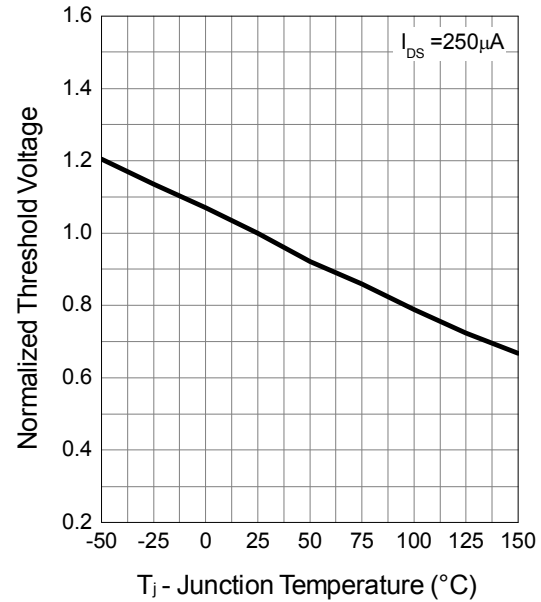


Typical Operating Characteristics (Cont.)

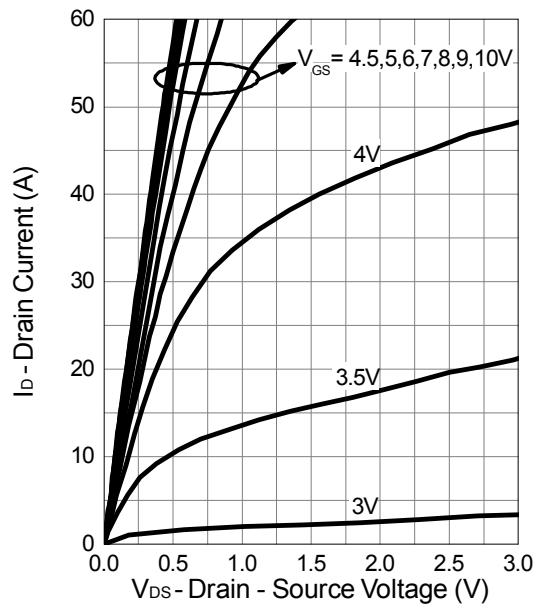
Gate-Source On Resistance



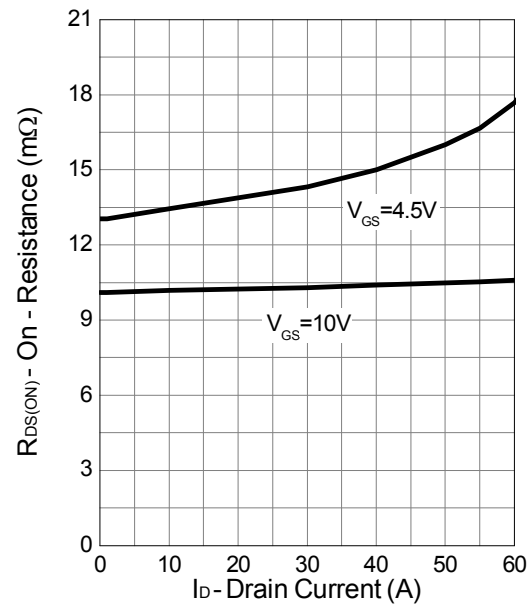
Gate Threshold Voltage



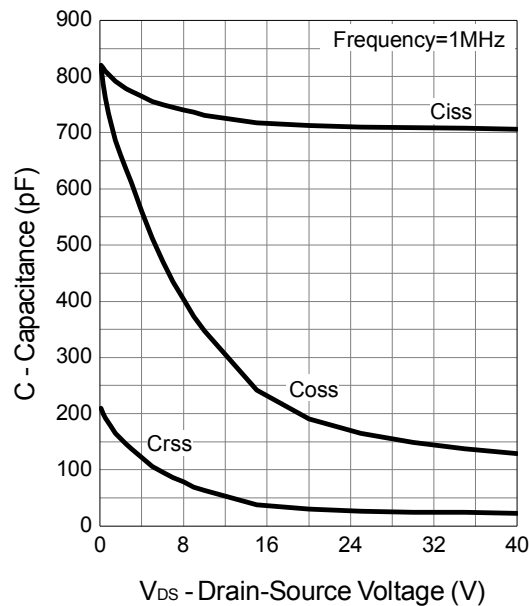
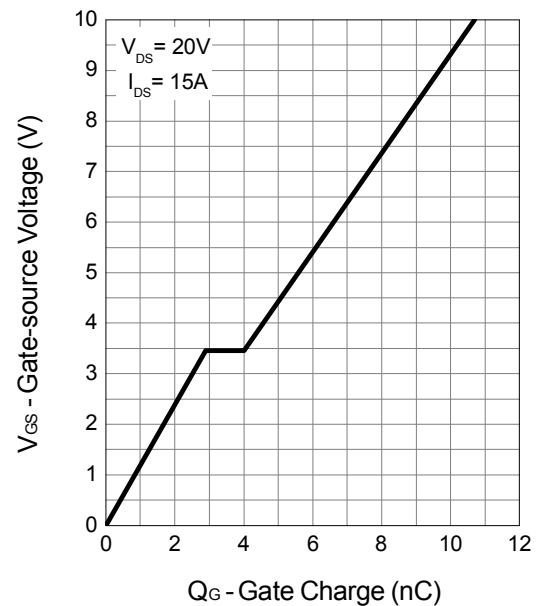
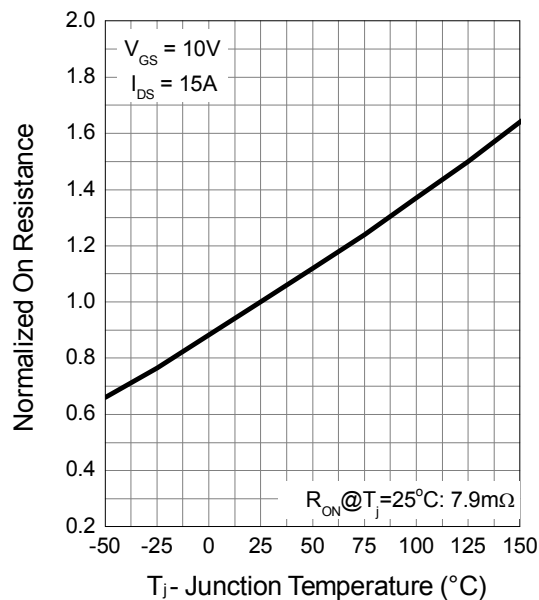
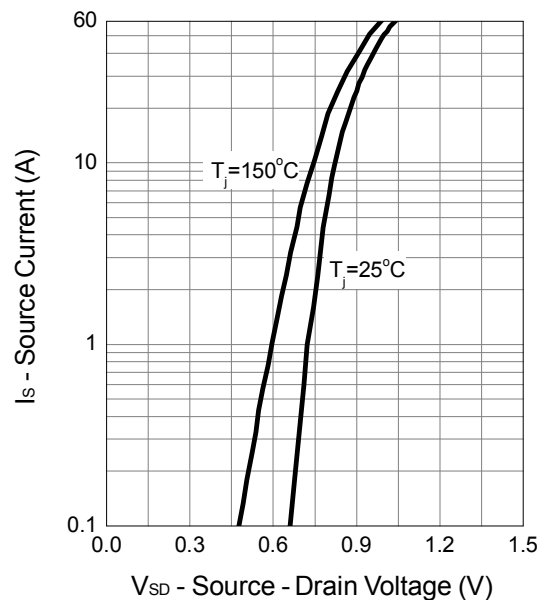
Output Characteristics



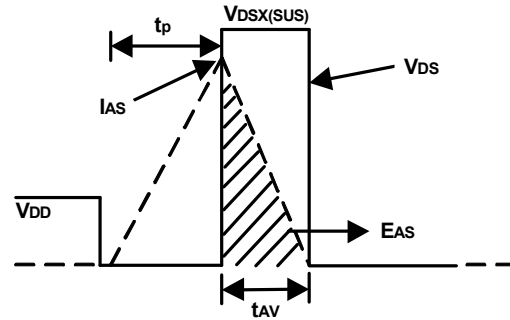
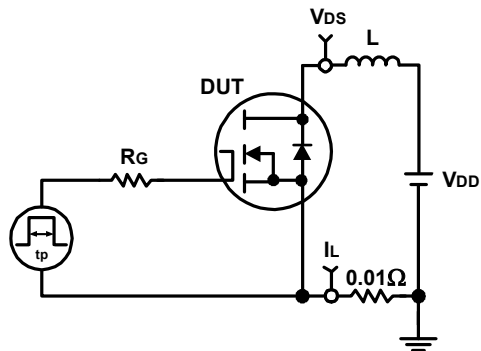
Drain-Source On Resistance



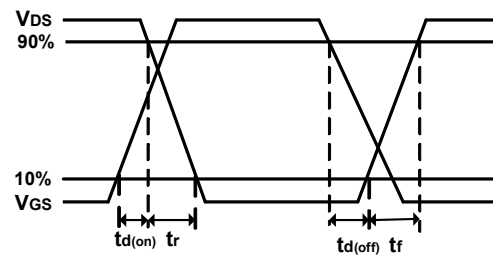
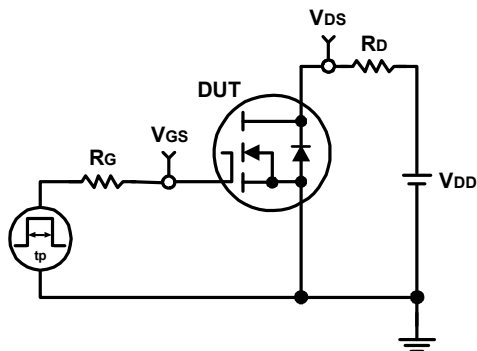
Typical Operating Characteristics (Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

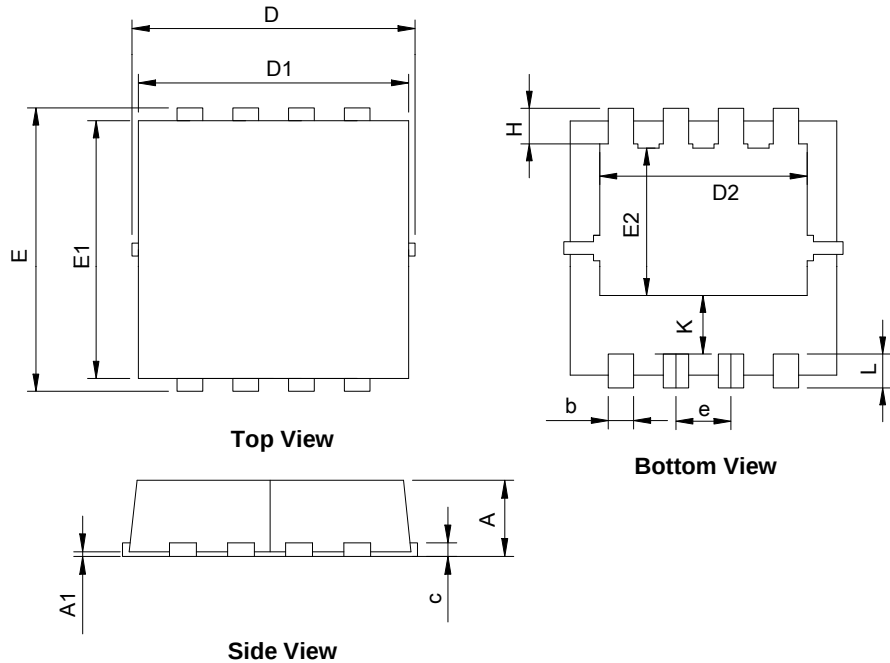


Switching Time Test Circuit and Waveforms



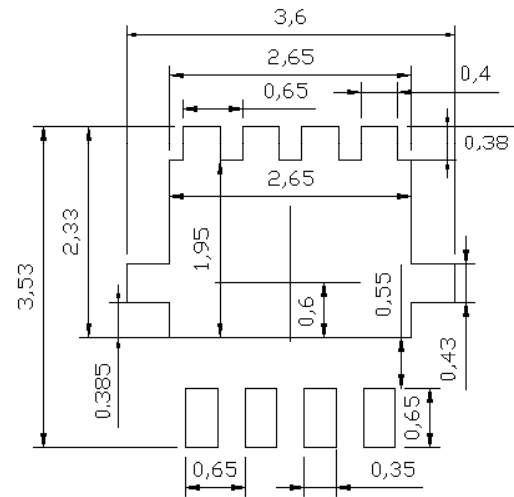
Package Information

PDFN3.3x3.3-8L



SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.10	0.25	0.004	0.010
D	3.10	3.50	0.122	0.138
D1	3.05	3.25	0.120	0.128
D2	2.35	2.59	0.093	0.102
E	3.10	3.50	0.122	0.138
E1	2.90	3.10	0.114	0.122
E2	1.64	1.98	0.065	0.078
e	0.65 BSC		0.026 BSC	
H	0.32	0.52	0.013	0.020
K	0.59	0.79	0.023	0.031
L	0.25	0.55	0.010	0.022

RECOMMENDED LAND PATTERN



UNIT: mm