

N-Channel 100 V MOSFET

Product summary

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
100	18 @ $V_{GS} = 10V$	45 ⁽¹⁾

Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

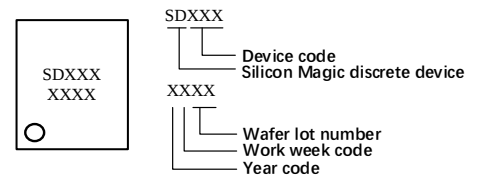
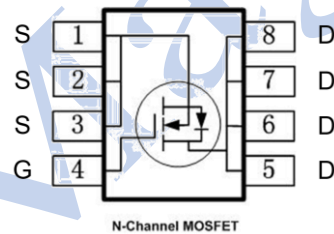
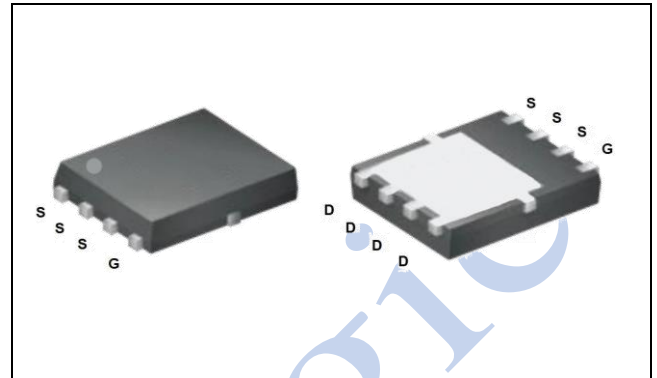
- DC/DC conversion
- Power switch
- Motor drives

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Package and ordering information

Ordering code	Package	Device code
SDN10K018S2C	PDFN5*6-8L	ACJ

PDFN5*6-8L



1. Maximum ratings

Absolute maximum ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	
Continuous drain current ⁽¹⁾	$T_C = 25^\circ\text{C}$	45	A
	$T_C = 100^\circ\text{C}$	28	
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾	9	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	180	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	76	mJ
Power dissipation	$T_C = 25^\circ\text{C}$	69	W
	$T_A = 25^\circ\text{C}$ ⁽⁴⁾	2.7	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

2. Thermal resistance ratings

Thermal resistance ratings						
Parameter		Symbol	Max.	Unit		
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	1.8	°C/W		
Thermal resistance, junction-to-ambient ⁽⁴⁾	Steady state	$R_{\theta JA}$	45			

3. Electrical Characteristics

Electrical characteristics						
Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.2	1.9	2.6	V
Gate-body leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 9\text{ A}$		13	18	m Ω
Forward transconductance ⁽⁵⁾	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 9\text{ A}$		38		S
Gate resistance	R_g			1	2	Ω
Dynamic ⁽⁵⁾						
Total gate charge	Q_g	$V_{DS} = 50\text{ V}, I_D = 9\text{ A}, V_{GS} = 10\text{ V}$		25	35	nC
Gate-source charge	Q_{gs}			4	6	
Gate-drain charge	Q_{gd}			8	12	
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 50\text{ V}, I_D = 9\text{ A}, V_{GS} = 10\text{ V},$ $R_{GEN} = 6\text{ }\Omega$		11	22	ns
Rise time	t_r			6	12	
Turn-off delay time	$t_{d(off)}$			34	68	
Fall time	t_f			11	22	
Input capacitance	C_{iss}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1200	1680	pF
Output capacitance	C_{oss}			210	295	
Reverse transfer capacitance	C_{rss}			7	14	
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_F = 9\text{ A}$		0.8	1.1	V
Reverse recovery time	t_{rr}	$V_{DS} = 50\text{ V}, I_F = 9\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		38	69	ns
Reverse recovery charge	Q_{rr}			67	121	nC

Notes

- (1) Limited by maximum junction temperature.
- (2) Pulse width limited by maximum junction temperature.
- (3) $V_{DS} = 75\text{ V}, V_{GS} = 10\text{ V}, L = 0.3\text{ mH}$.
- (4) $R_{\theta JA}$ is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5x1.5 in. board of FR-4 material.
- (5) Guaranteed by design, not subject to production testing.

4. Electrical characteristics diagrams

Fig.1 Typ. transfer characteristics

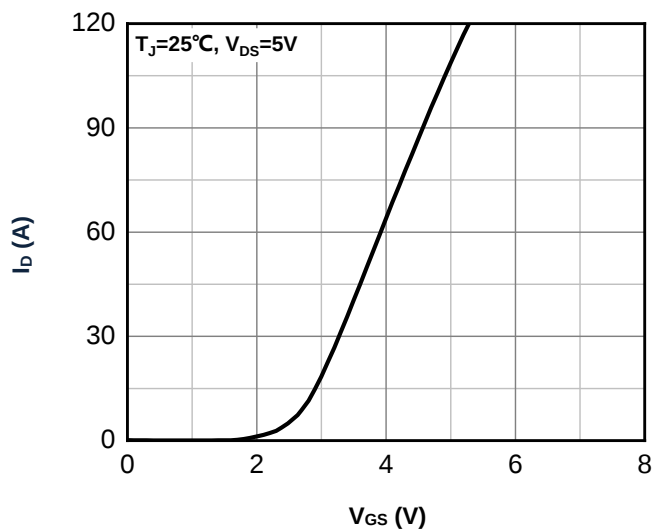


Fig.2 Typ. output characteristics

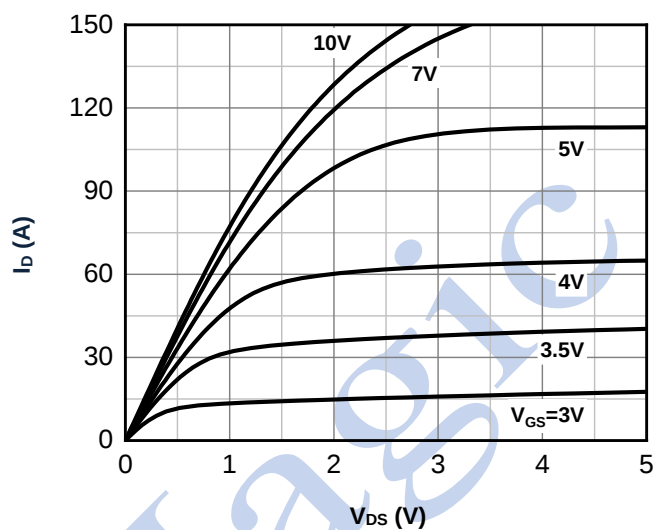


Fig.3 Normalized on-resistance vs drain current

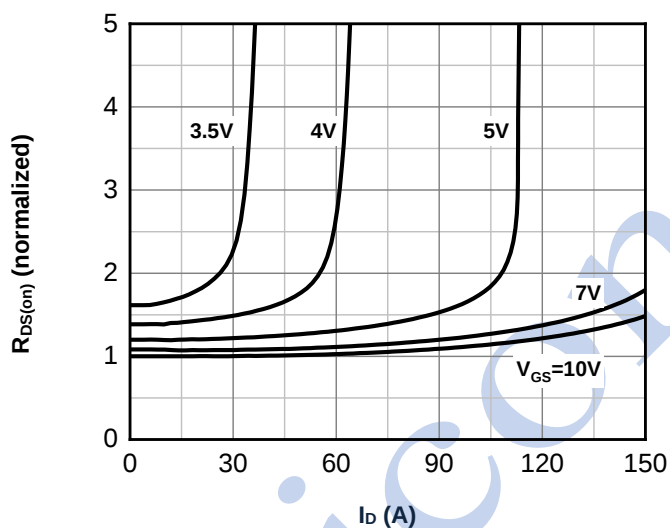


Fig.4 Typ. on-resistance vs gate-source voltage

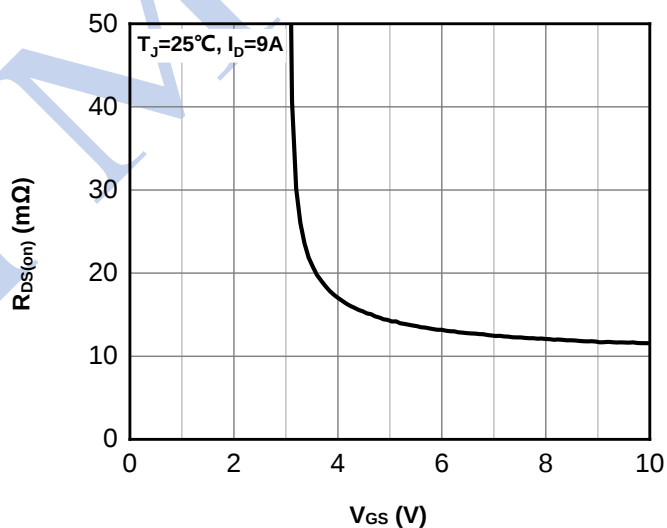


Fig.5 Normalized on-resistance vs junction temperature

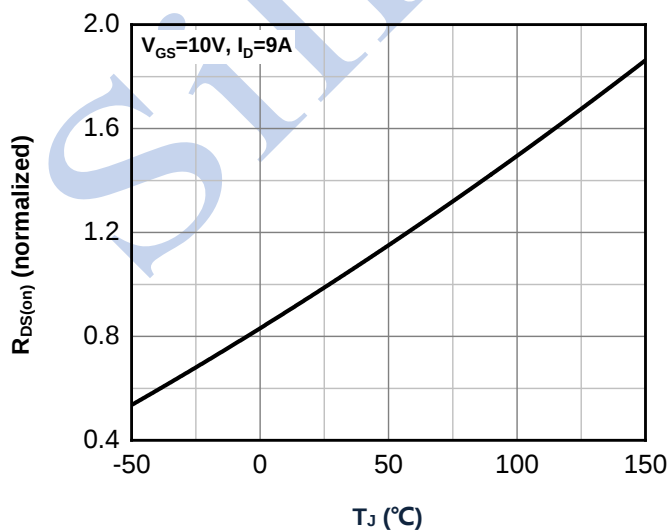


Fig.6 Typ. gate charge

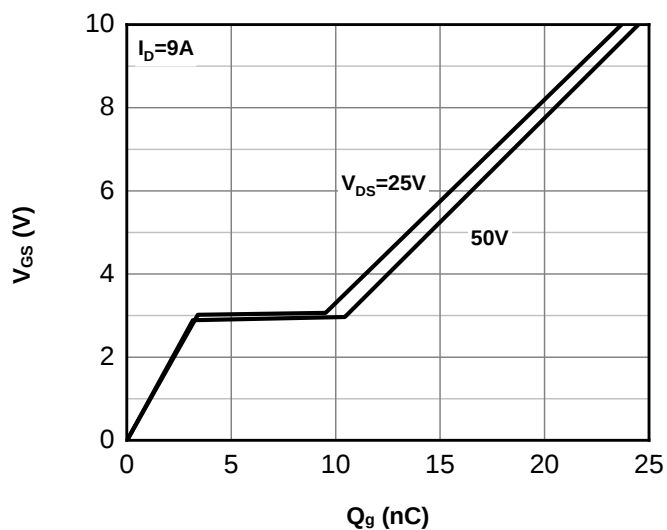


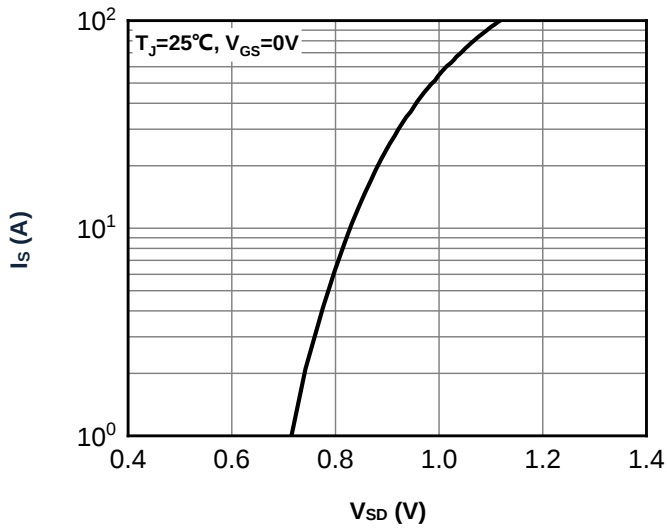
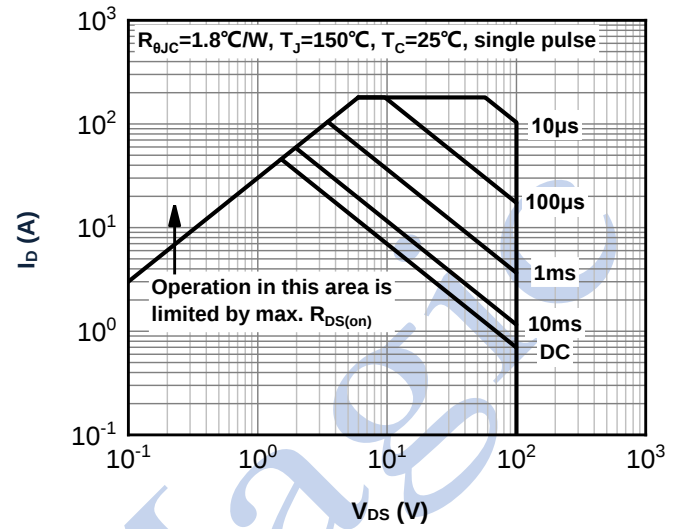
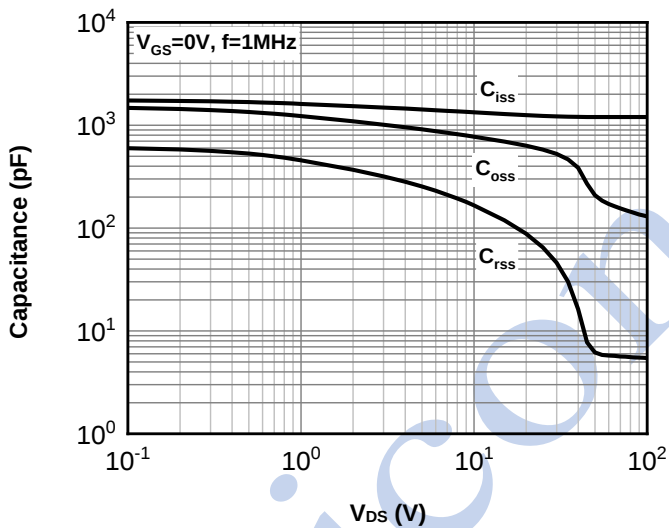
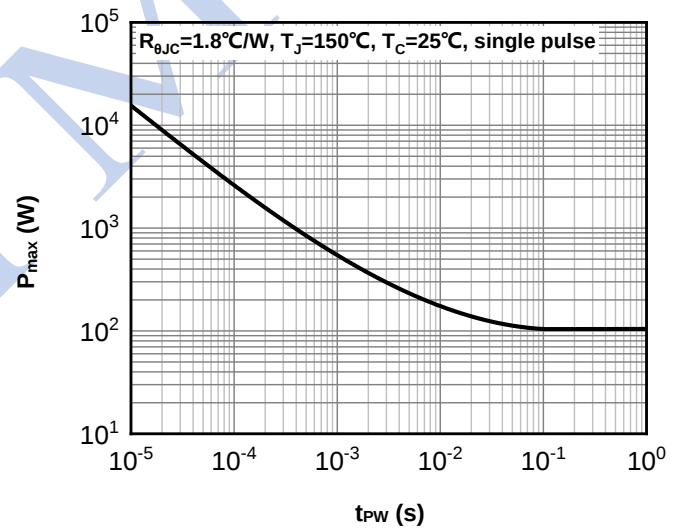
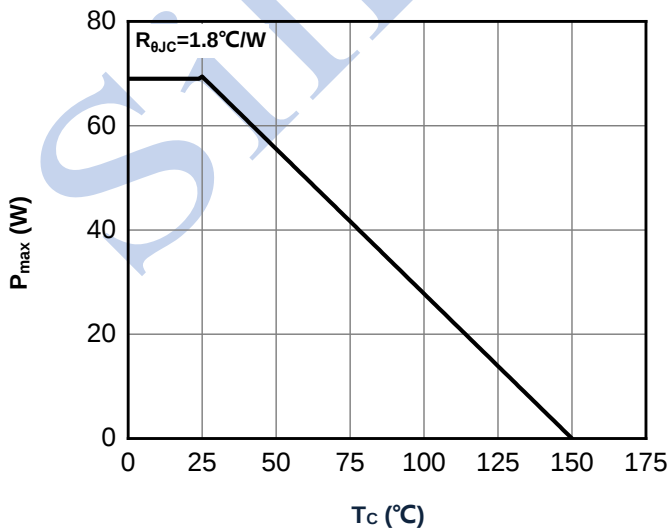
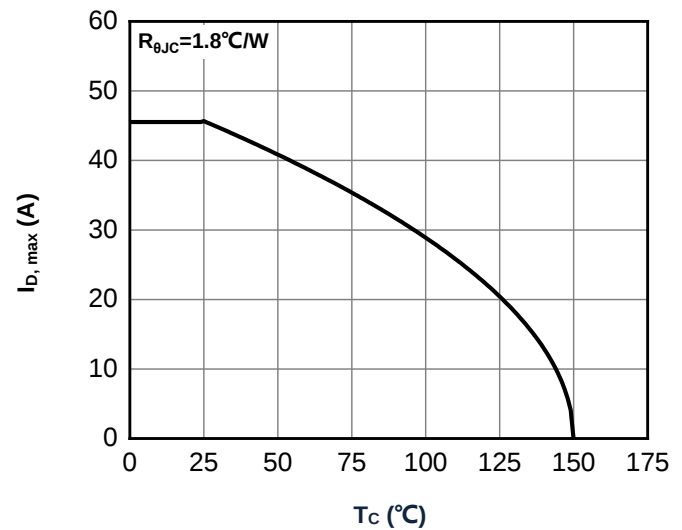
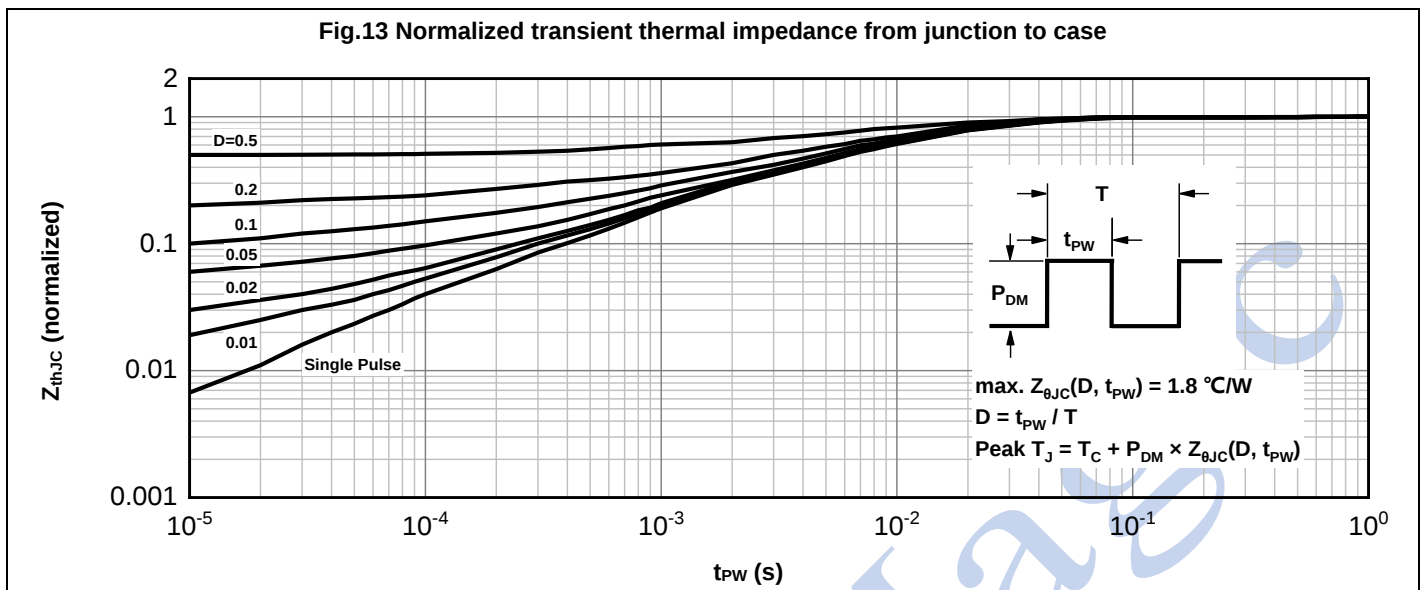
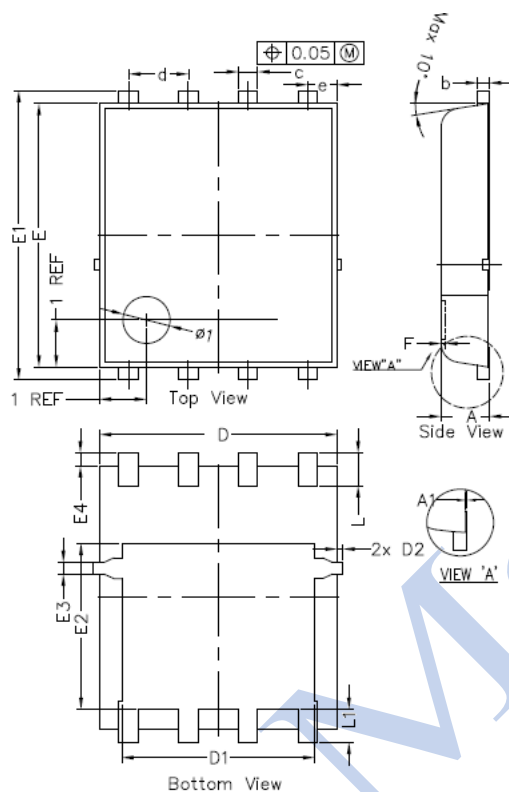
Fig.7 Typ. forward characteristics of body diode

Fig.8 Safe operating area

Fig.9 Typ. Capacitance

Fig.10 Single pulse maximum power dissipation

Fig.11 Max. power dissipation vs case temperature

Fig.12 Max. continuous drain current vs case temperature


Fig.13 Normalized transient thermal impedance from junction to case



5. Package outline dimensions



Dim	Millimeters		
	Min	Nom	Max
A	0.900	1.000	1.100
A1	0.000	---	0.050
b	0.246	0.254	0.312
c	0.310	0.410	0.510
d	1.27BSC		
D	4.950	5.050	5.150
D1	4.000	4.100	4.200
D2	---	---	0.125
e	0.62BSC		
E	5.500	5.600	5.700
E1	6.050	6.150	6.250
E2	3.425	3.525	3.625
E3	0.150	0.250	0.350
E4	0.175	0.275	0.375
F	---	---	0.100
L	0.500	0.600	0.700
L1	0.600	0.700	0.800

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