

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

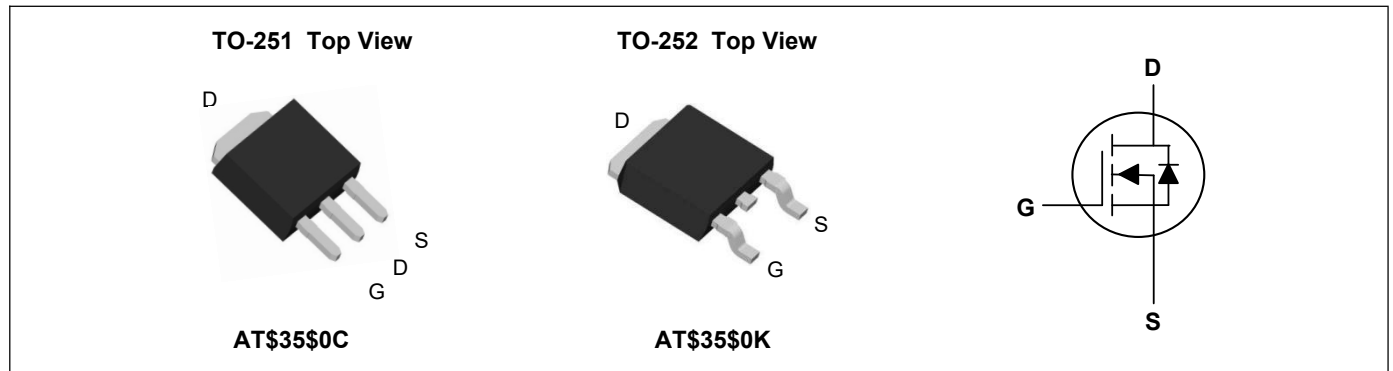
Product Summary



V_{DS}	30	V
I_D	50	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	8.5	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	15	m Ω

Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



Absolute Maximum Ratings($T_C=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	I_D	50	A
Continuous Drain Current ¹	I_D	35	A
Pulsed Drain Current ²	I_{DM}	200	A
Single Pulse Avalanche Energy ³	EAS	72	mJ
Total Power Dissipation ⁴	P_D	58	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	2.5	$^\circ C/W$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	30	---	---	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	---	6.5	8.5	mΩ
		V _{GS} =4.5V, I _D =15A	---	10	15	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	1.0	1.5	2.5	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	---	---	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =20A	---	15	---	S
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =20A	---	32	---	nC
Gate-Source Charge	Q _{gs}		---	5	---	
Gate-Drain Charge	Q _{gd}		---	7	---	
Turn-On Delay Time	T _{d(on)}	V _{DD} =15V, I _D =20A, V _{GS} =10V, R _G =1.8Ω	---	11	---	ns
Rise Time	T _r		---	8	---	
Turn-Off Delay Time	T _{d(off)}		---	26	---	
Fall Time	T _f		---	6	---	
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1995	---	pF
Output Capacitance	C _{oss}		---	285	---	
Reverse Transfer Capacitance	C _{rss}		---	205	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ¹	I _S	V _G =V _D =0V, Force Current	---	---	50	A
Diode Forward Voltage ²	V _{SD}	V _{GS} =0V, I _S =20A, T _J =25°C	---	0.8	1.3	V
Reverse Recovery Time	t _{rr}	I _F =20A, di/dt=100A/μs, T _J =25°C	---	18	---	nS
Reverse Recovery Charge	Q _{rr}		---	14	---	nC

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
- The EAS data shows Max. rating. The test condition is V_{DD}=15V, V_{GS}=10V, L=0.5mH
- The power dissipation is limited by 150°C junction temperature

Typical Characteristics

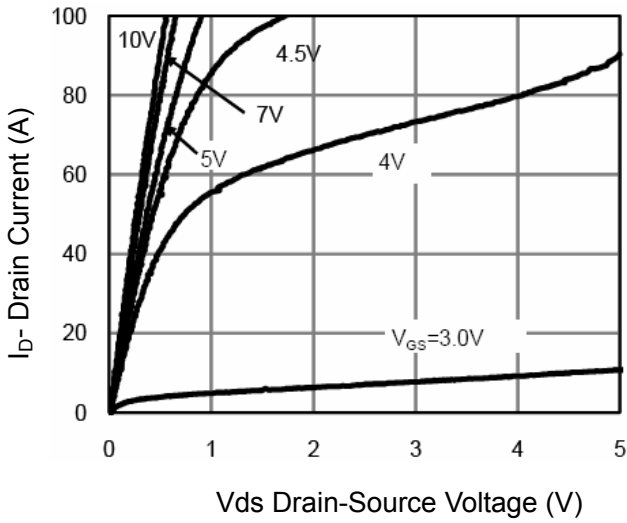


Figure 1 Output Characteristics

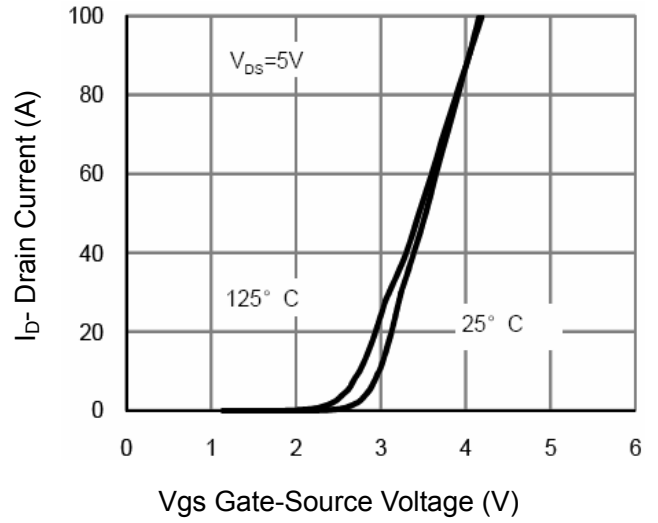


Figure 2 Transfer Characteristics

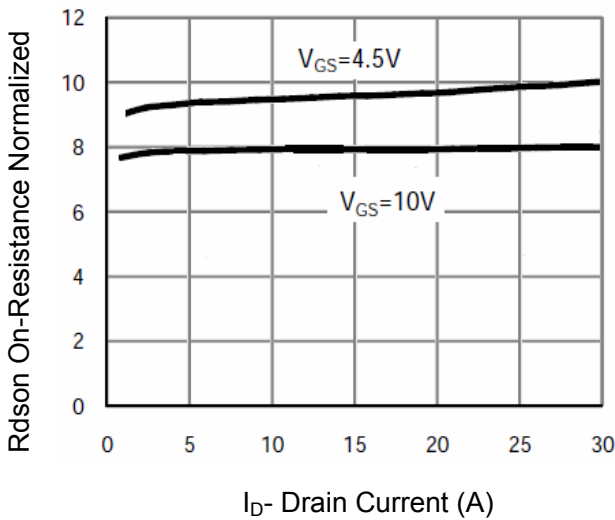


Figure 3 Rdson- Drain Current

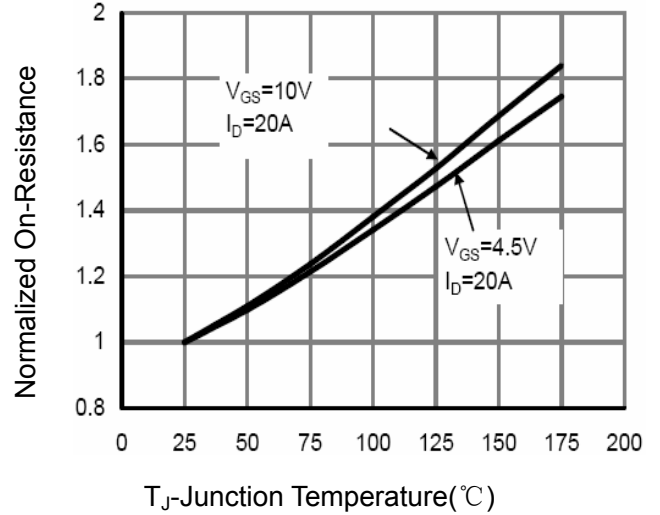


Figure 4 Rdson-Junction Temperature

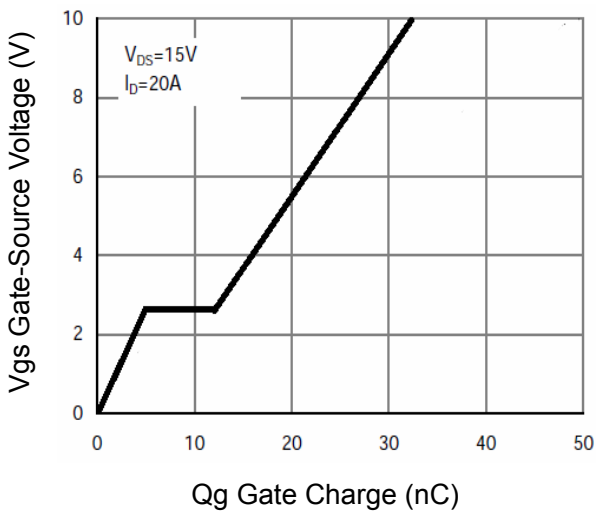


Figure 5 Gate Charge

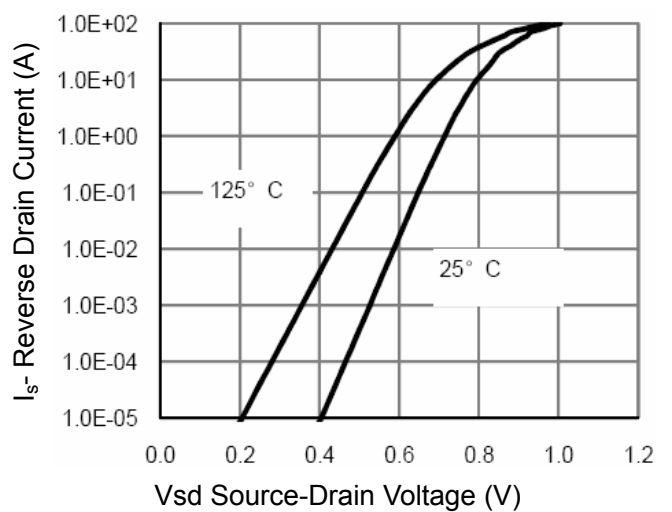


Figure 6 Source- Drain Diode Forward

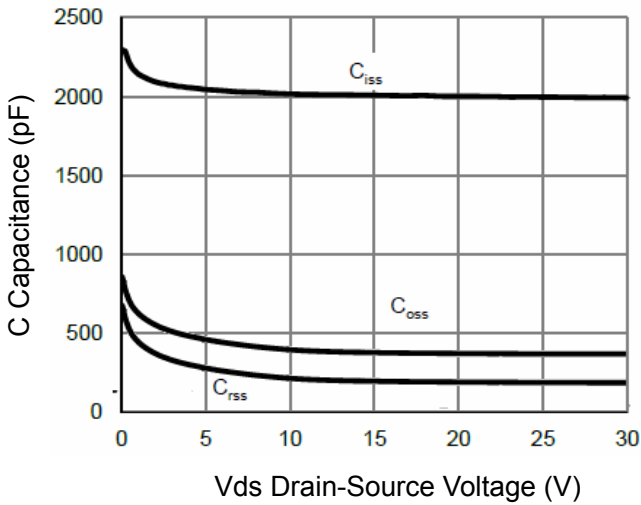


Figure 7 Capacitance vs Vds

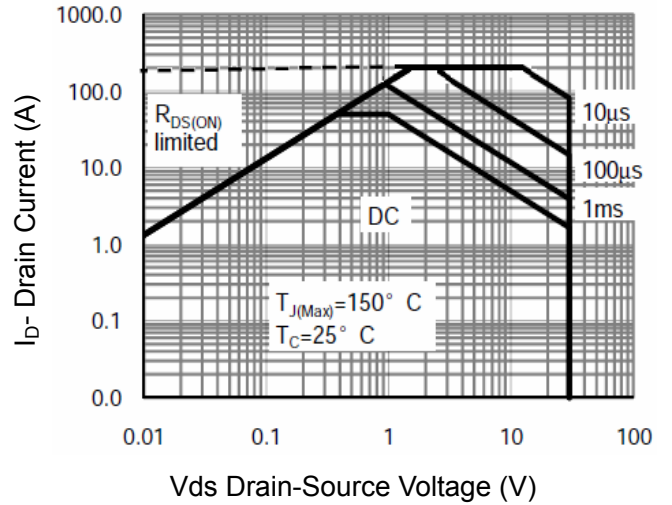


Figure 8 Safe Operation Area

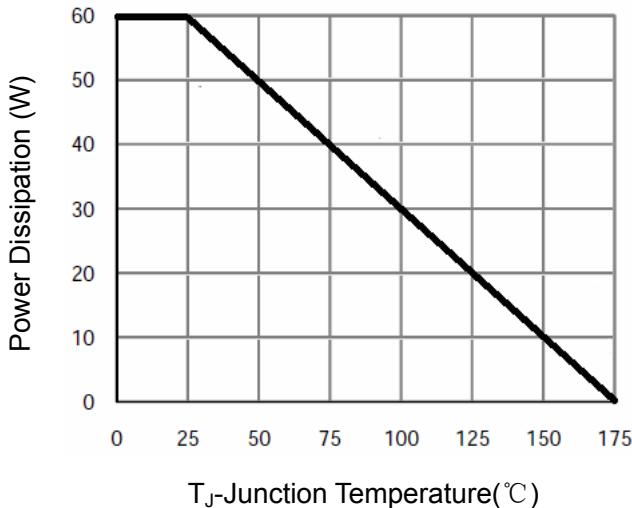


Figure 9 Power De-rating

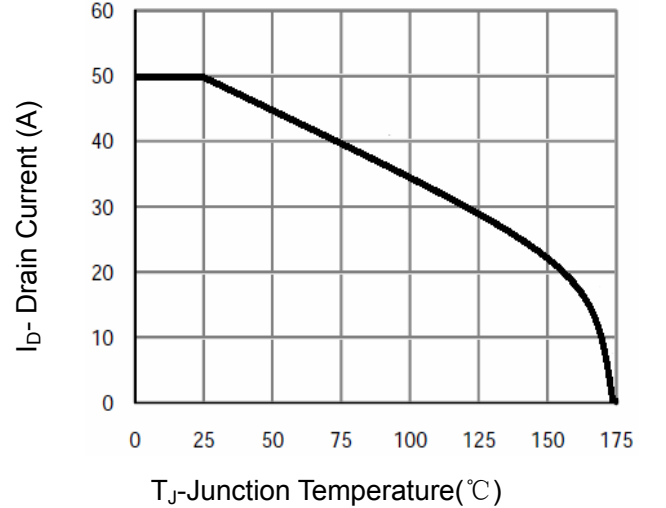


Figure 10 ID Current- Junction Temperature

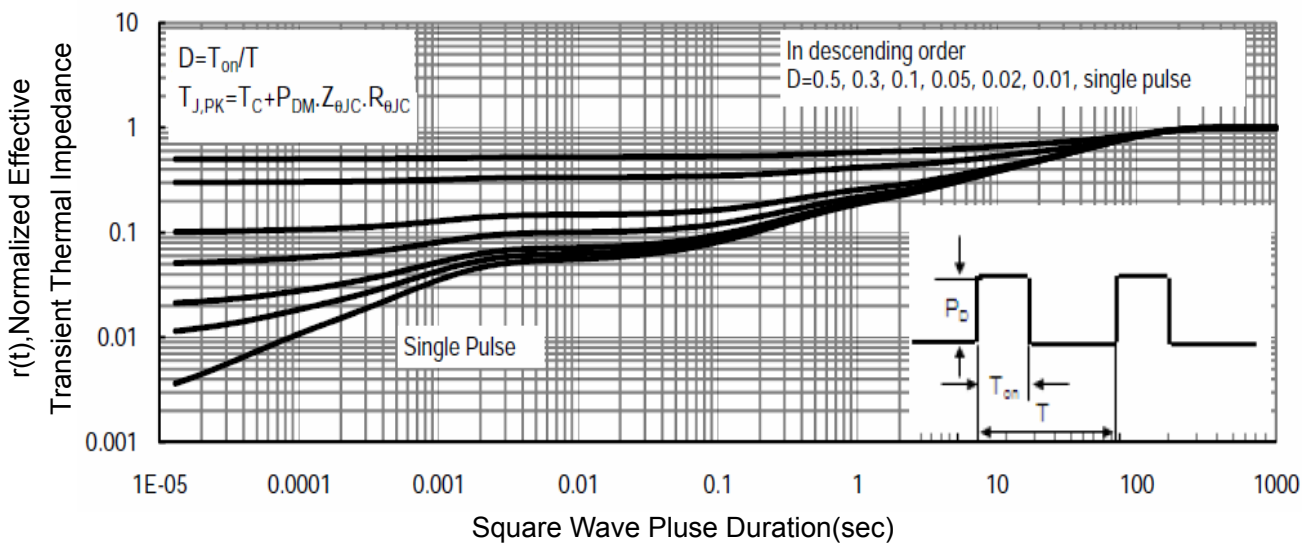
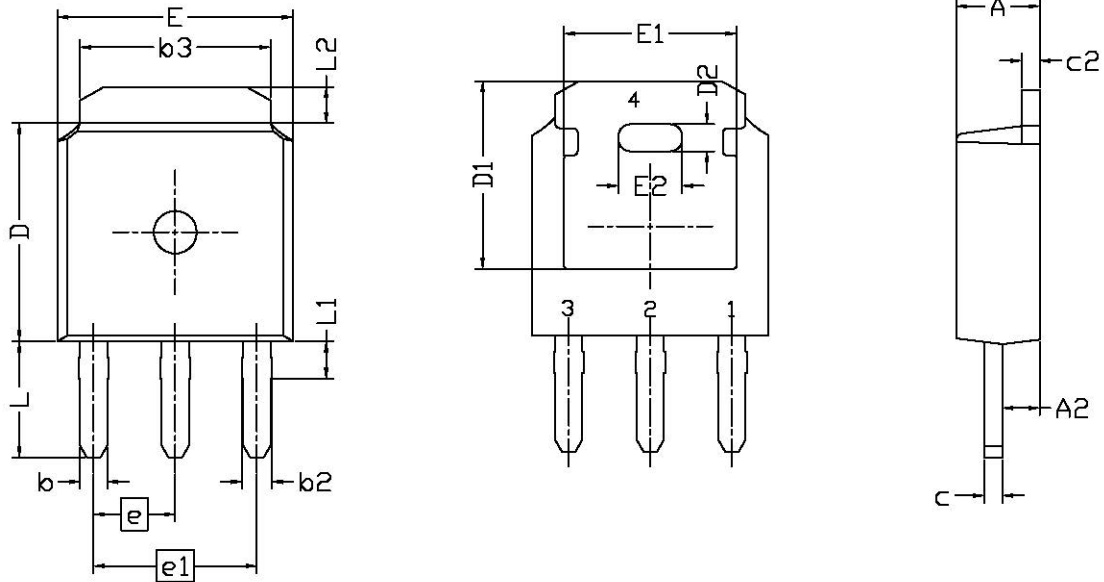


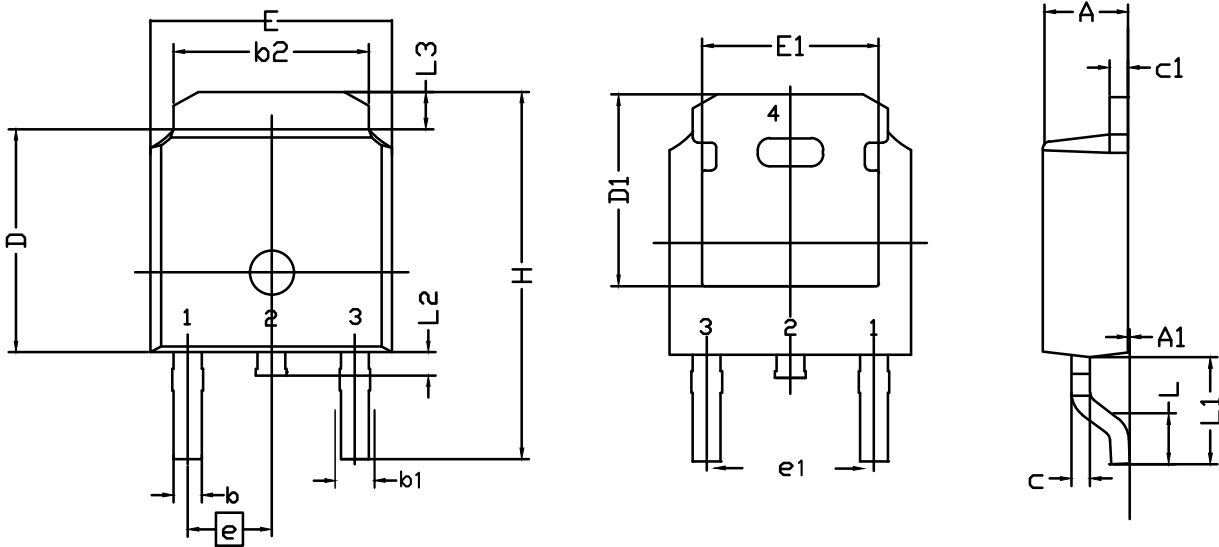
Figure 11 Normalized Maximum Transient Thermal Impedance

TO-251 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.39	A2	0.90	1.00	1.14
b	0.63	0.76	0.85	b2	0.76	0.85	1.05
b3	5.10	5.40	5.60	C	0.46	0.51	0.61
C2	0.46	0.51	0.61	D	5.90	6.10	6.30
D1	5.25 REF			D2	0.508 BSC		
E	6.35	6.55	6.70	E1	5.06 REF		
E2	1.524 BSC			e	2.29 BSC		
e1	4.57 BSC			L	3.70	4.00	4.40
L1	1.15 REF			L2	0.90	1.06	1.20

TO-252 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.38	E	6.40	6.60	6.731
A₁	0.00	0.10	0.20	E₁	4.40	--	--
b	0.64	0.76	0.89	e	2.286 BSC		
b₁	0.77	0.85	1.14	e₁	4.572 BSC		
b₂	5.00	5.33	5.46	H	9.40	10.00	10.40
c	0.458	0.508	0.610	L	1.40	1.52	1.77
C₁	0.458	0.508	0.620	L₁	--	2.743	--
D	5.98	6.10	6.223	L₂	0.60	0.80	1.01
D₁	5.20	5.25	5.38	L₃	0.90	1.06	1.25