



Features

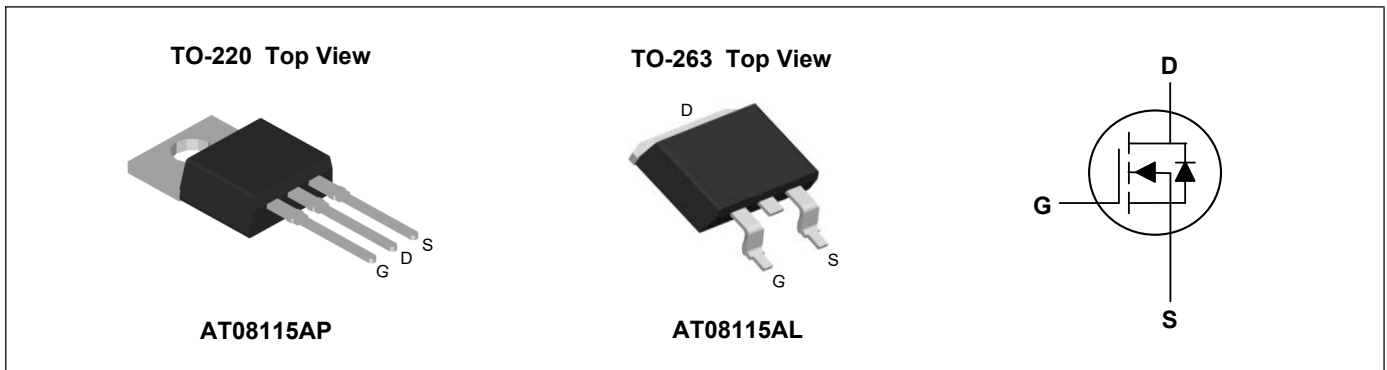
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

V_{DS}	80	V
I_D	115	A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	7.5	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}	80	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	$I_D@T_C=25^\circ C$	115	A
Continuous Drain Current ¹	$I_D@T_C=100^\circ C$	80	A
Pulsed Drain Current ²	I_{DM}	460	A
Single Pulse Avalanche Energy ³	EAS	390	mJ
Avalanche Current	I_{AS}	51	A
Total Power Dissipation ⁴	$P_D@T_C=25^\circ C$	200	W
Total Power Dissipation ⁴	$P_D@T_C=100^\circ C$	100	W
Storage Temperature Range	T_{STG}	-55 to 175	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 175	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	---	62.5	$^\circ C/W$
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	---	0.75	$^\circ C/W$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	80	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	---	6.4	7.5	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	3	4	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	---	---	1	uA
		$V_{DS}=80V, V_{GS}=0V, T_J=100^{\circ}\text{C}$	---	---	25	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	80	---	---	S
Total Gate Charge	Q_g	$V_{DD}=40V, V_{GS}=10V, I_D=20A$	---	112	---	nC
Gate-Source Charge	Q_{gs}		---	35	---	
Gate-Drain Charge	Q_{gd}		---	23	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=40V, V_{GS}=10V, R_G=2.5\Omega, I_D=20A$	---	24	---	ns
Rise Time	T_r		---	19	---	
Turn-Off Delay Time	$T_{d(off)}$		---	70	---	
Fall Time	T_f		---	30	---	
Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V, f=1\text{MHz}$	---	6650	---	pF
Output Capacitance	C_{oss}		---	302	---	
Reverse Transfer Capacitance	C_{rss}		---	261	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current ^{1,5}	I_S	$T_C=25^{\circ}\text{C}$	---	---	115	A
Pulsed Source Current ²	I_{SM}		---	---	460	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=20A, T_J=25^{\circ}\text{C}$	---	---	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=20A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	37	---	nS
Reverse Recovery Charge	Q_{rr}		---	58	---	nC

Note:

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.1mH$
- 4.The power dissipation is limited by 175 $^{\circ}\text{C}$ junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

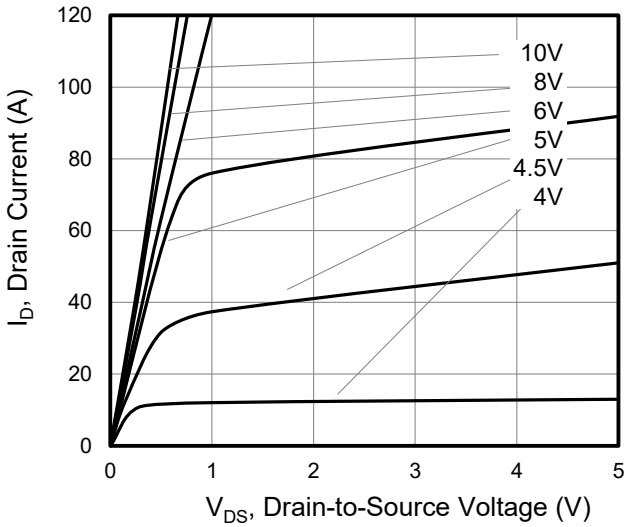


Figure 1. Output Characteristics

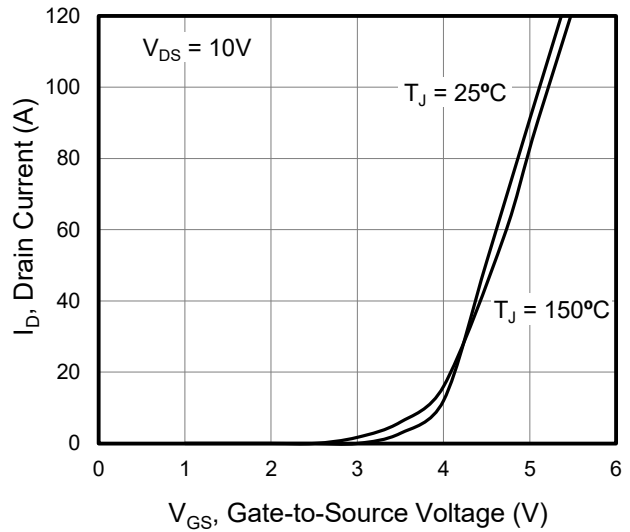


Figure 2. Transfer Characteristics

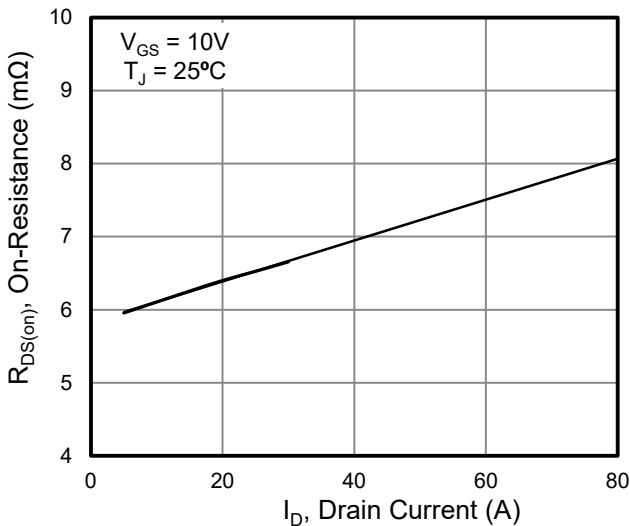


Figure 3. On-Resistance vs. Drain Current

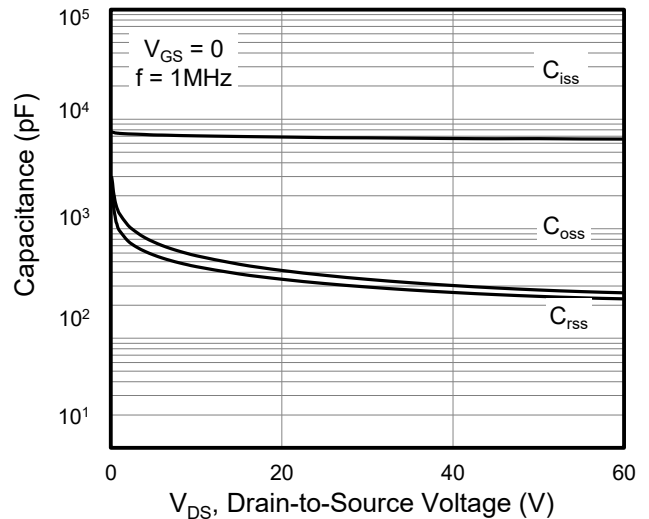


Figure 4. Capacitance

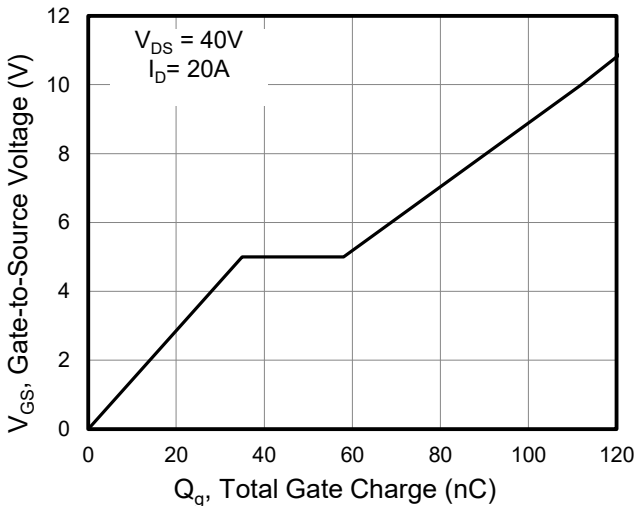


Figure 5. Gate Charge

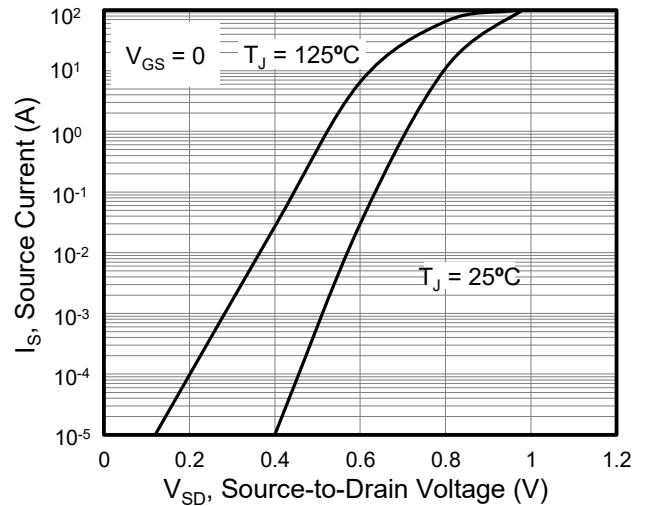


Figure 6. Body Diode Forward Voltage

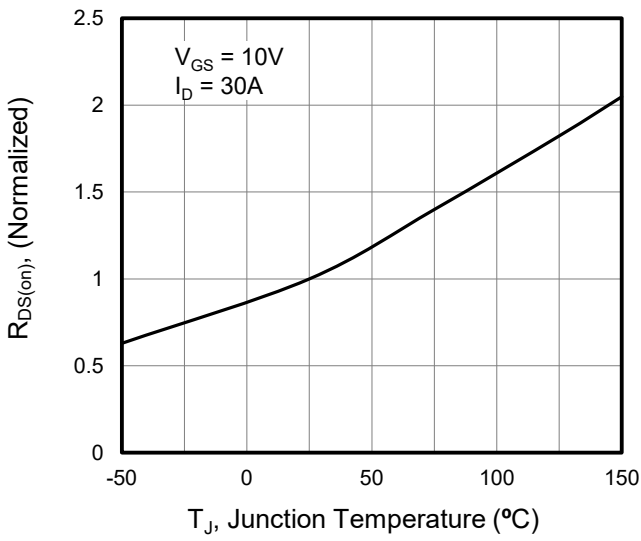


Figure 7. On-Resistance vs. Temperature

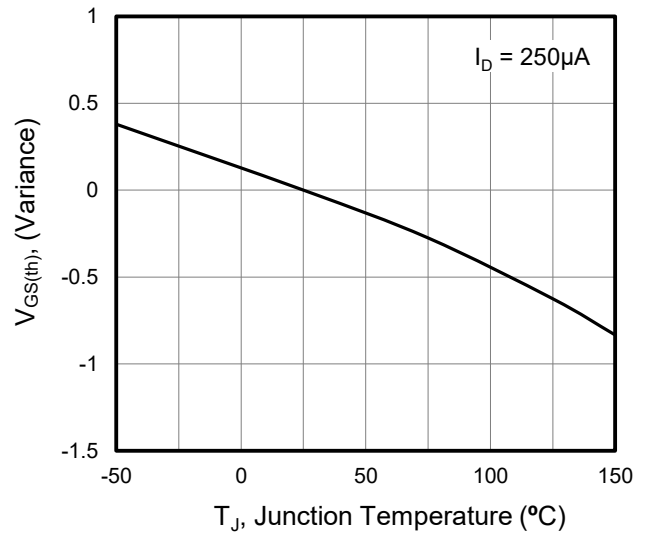


Figure 8. Threshold Voltage vs. Temperature

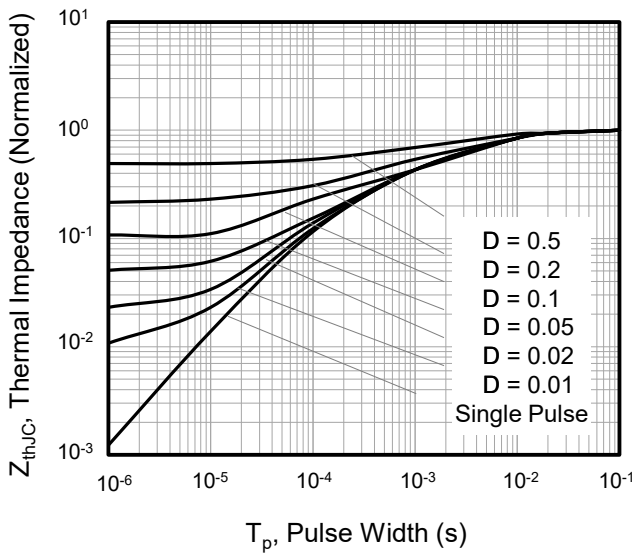


Figure 9. Transient Thermal Impedance

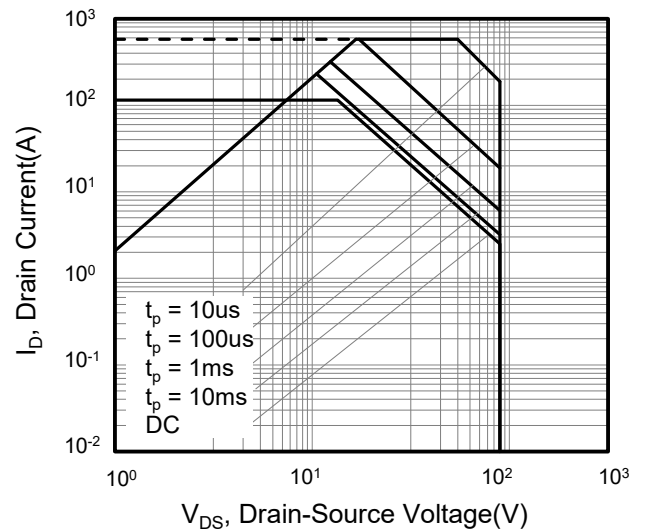
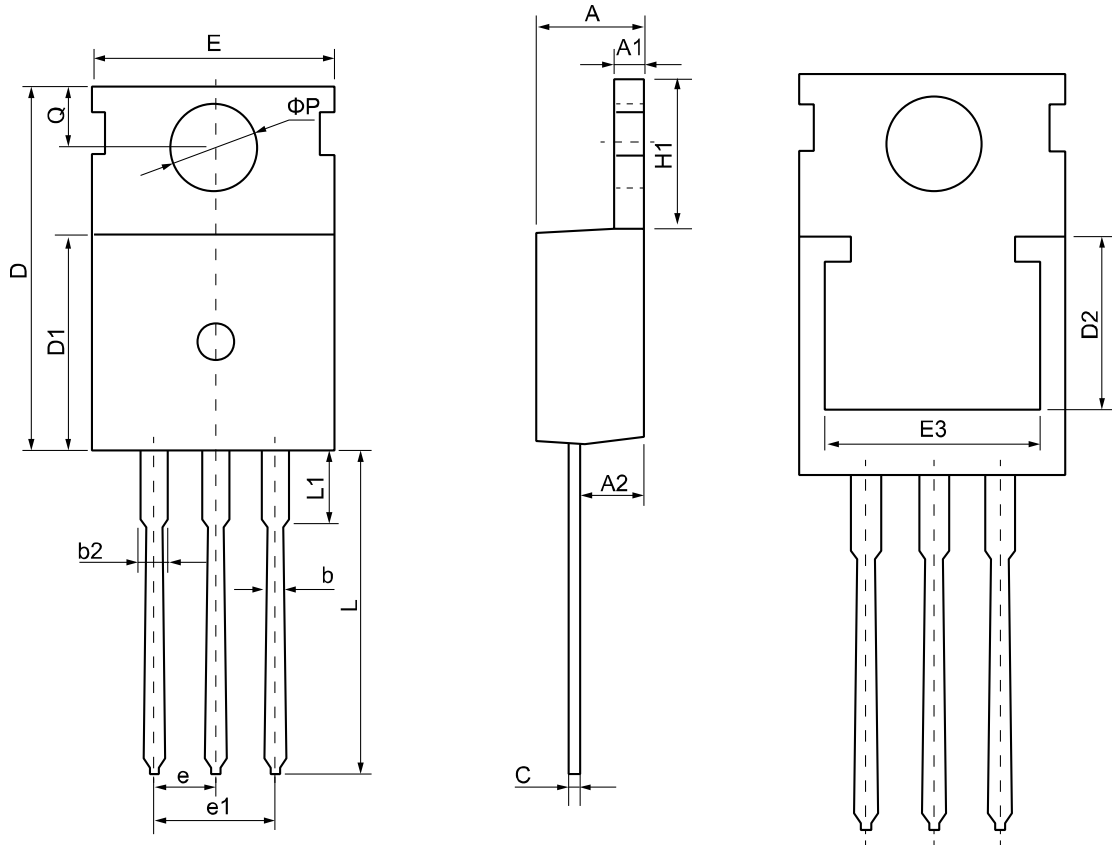


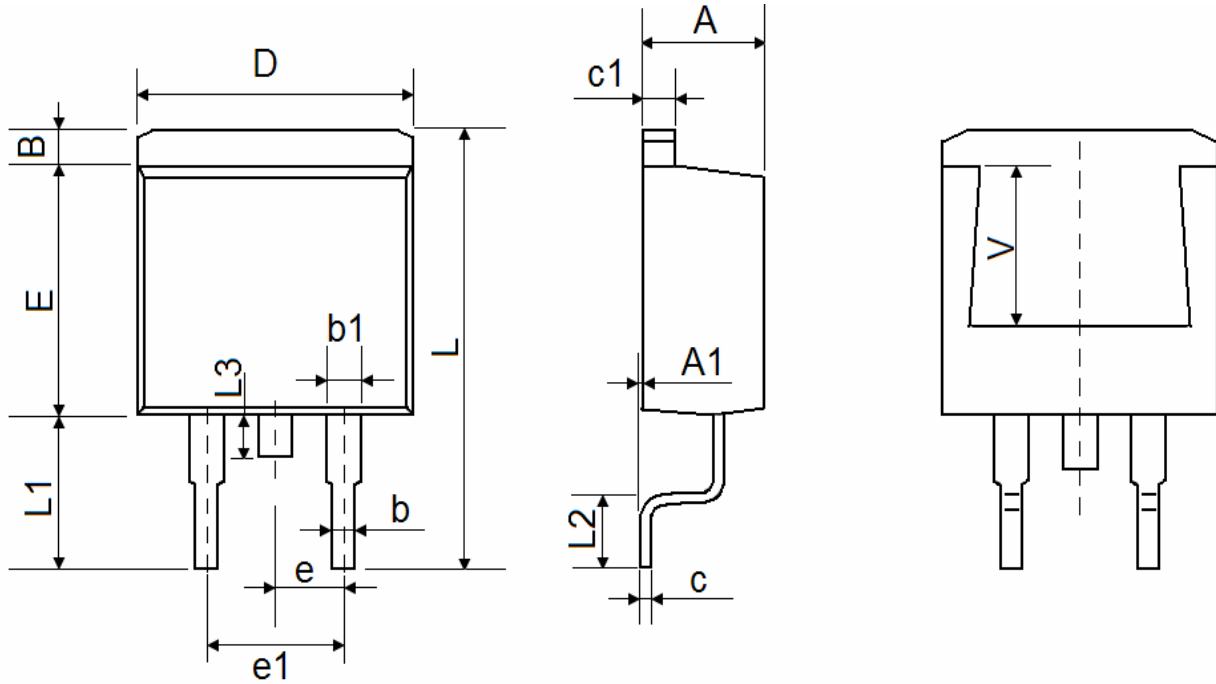
Figure 10. Safe operation area for

TO-220 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.30	4.55	4.75	E	9.65	10.00	10.25
A1	1.15	1.30	1.45	E3	7.00	--	--
A2	2.20	2.40	2.60	e	2.54 BSC		
b	0.70	0.80	0.95	e1	5.08 BSC		
b2	1.17	1.27	1.47	H1	6.30	6.50	6.80
c	0.40	0.50	0.65	L	12.70	13.50	14.10
D	15.30	15.60	15.90	L1	--	3.20	3.95
D1	8.90	9.10	9.35	phi P	3.40	3.60	3.80
D2	5.50	--	--	Q	2.60	2.80	3.00

TO-263 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.40	4.55	4.70	A1	0.00	0.07	0.15
B	1.00	1.20	1.40	b	0.65	0.80	0.95
b1	1.10	1.15	1.37	c	0.30	0.40	0.53
c1	1.10	1.25	1.37	D	9.80	10.00	10.40
E	8.50	8.80	9.20	e	2.54 REF		
e1	4.90	5.10	5.40	L	14.80	15.20	15.70
L1	5.00	5.25	5.60	L2	2.05	2.45	2.80
L3	1.20	1.50	1.80	V	5.60 REF		