

ID	$R_{DS(ON)}$ (Typ)	VDSS
50A	15m Ω	60V

Applications:

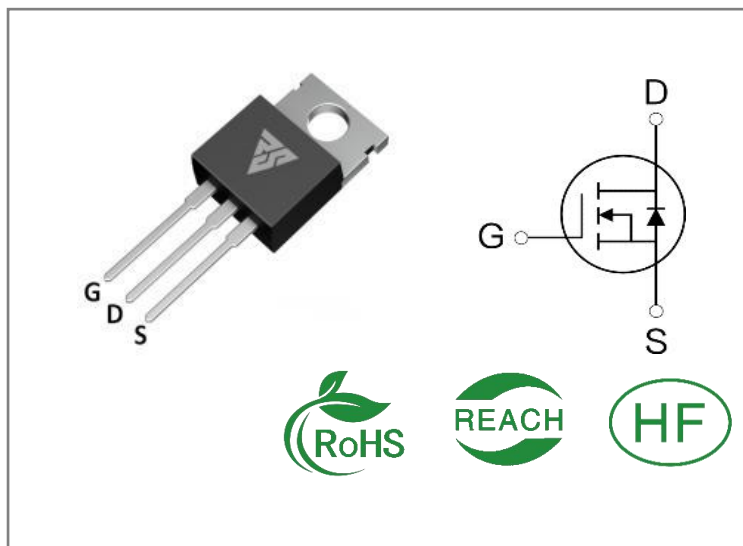
- Load Switch
- PWM Applications
- Power Management

Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability

Ordering Information

Part Number	Package	Marking	Packing	Qty.
RS60N50T	T0-220	RS60N50T	Tube	50 PCS


Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	RS60N50T	Units
VDSS	Drain-to-Source Voltage	60	V
ID	Continuous Drain Current $T_C=25^\circ\text{C}$	50	A
ID	Continuous Drain Current $T_C=100^\circ\text{C}$	33	
IDM	Pulsed Drain Current (Note*1)	200	
PD	Power Dissipation	75	W
VGS	Gate- to- Source Voltage	± 20	V
EAS	Single Pulse Avalanche Energy	81	mJ
TL TPKG	Maximum Temperature for Soldering	300	$^\circ\text{C}$
	Leads at 0.063in(1.6mm)from Case for 10 seconds	260	
	Package Body for 10 seconds		
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 175	

* Drain Current Limited by Maximum Junction Temperature

Caution: Stresses greater than those listed in the "Absolute Maximum Ratings" Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	RS60N50T	Units	Test Conditions
R θ JC	Junction-to-Case	2	°C / W	Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 °C

OFF Characteristics T_J= 25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain- to- source Breakdown Voltage	60	--	--	V	V _{GS} =0V, I _D =250μA
IDSS	Drain- to- Source Leakage Current	--	--	1	μA	V _{DS} =60V, V _{GS} =0V
IGSS	Gate- to- Source Forward Leakage	--	--	100	nA	V _{GS} =20V , V _{DS} =0V
	Gate- to- Source Reverse Leakage	--	--	-100		V _{GS} =-20V , V _{DS} =0 V

ON Characteristics T_J=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R _{DS(on)}	Static Drain- to- Source On-Resistance(Note*2)	--	15	18	mΩ	V _{GS} =10V, I _D =30A
		--	19	24	mΩ	V _{GS} =4.5V, I _D =20A
V _{GS(TH)}	Gate Threshold Voltage	1.0	1.6	2.5	V	V _{GS} =V _{DS} , I _D =250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
t _{d(ON)}	Turn- on Delay Time	--	11	--	nS	V _{DS} =30V I _D =30A R _G =1.8Ω
t _{rise}	Rise Time	--	79	--		
t _{d(OFF)}	Turn- OFF Delay Time	--	33	--		
t _{fall}	Fall Time	--	107	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Ciss	Input Capacitance	--	2030	--	pF	VGS=0V VDS=25V f=1.0MHz
Coss	Output Capacitance	--	130	--		
Crss	Reverse Transfer Capacitance	--	115	--		
Qg	Total Gate Charge	--	45	--	nC	VDS=30V ID=30A VGS=10V
Qgs	Gate- to- Source Charge	--	8	--		
Qgd	Gate-to-Drain(" Miller") Charge	--	11	--		

Source- Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
IS	Continuous Source Current	--	--	50	A	Integral pn- diode in MOSFET
ISM	Maximum Pulsed Current	--	--	200	A	
VSD	Diode Forward Voltage	--	--	1.2	V	IS=30A,VGS=0V
trr	Reverse Recovery Time	--	14	--	nS	VGS=0V IS=30A di/dt=100A/μs
Qrr	Reverse Recovery Charge	--	10	--	nC	

Notes:

- * 1. Repetitive rating, pulse width limited by maximum junction temperature.
- * 2. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Feature Curve

Figure1: Output Characteristics

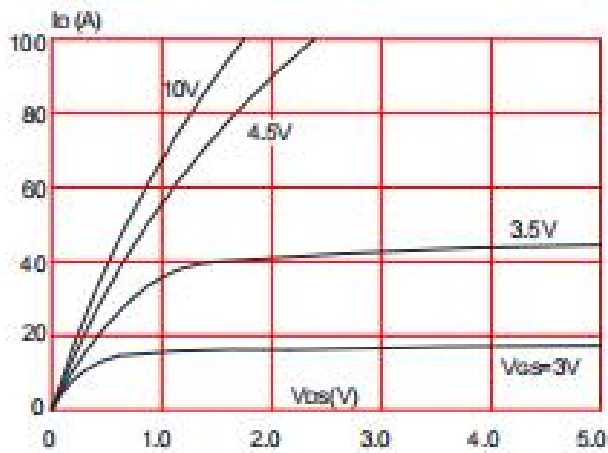


Figure 2: Typical Transfer Characteristics

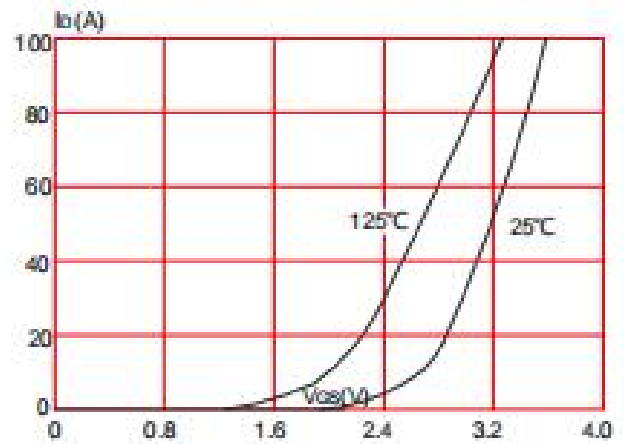


Figure 3: On-resistance vs. Drain Current

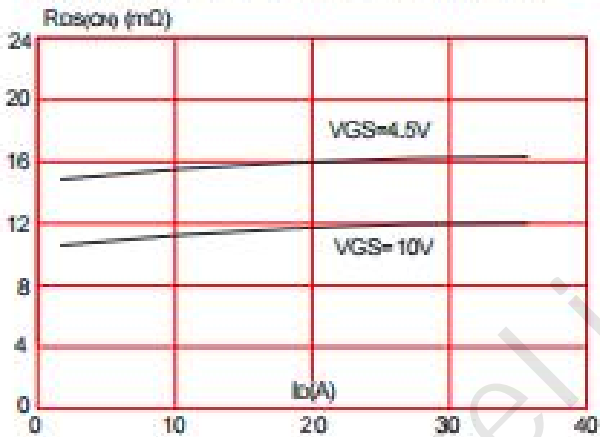


Figure 4: Body Diode Characteristics

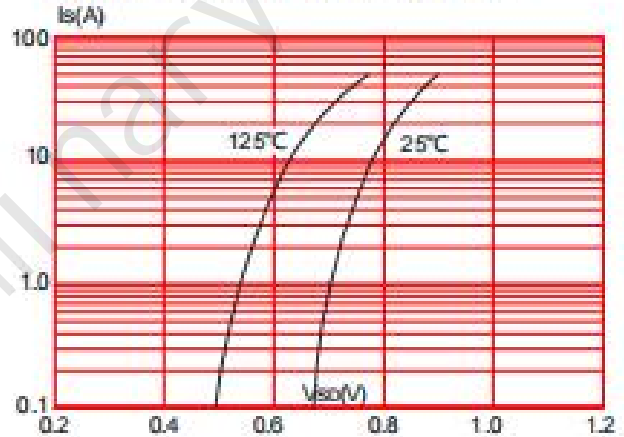


Figure 5: Gate Charge Characteristics

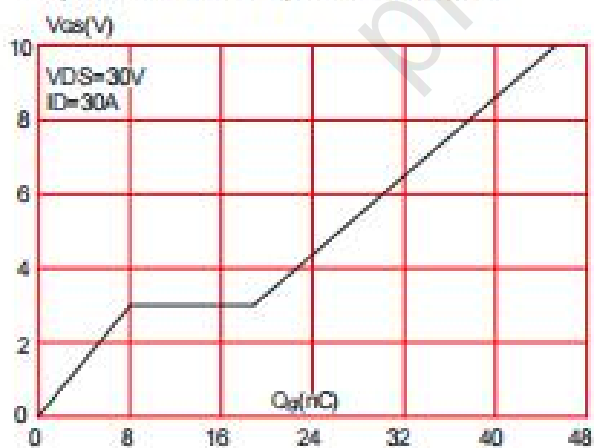


Figure 6: Capacitance Characteristics

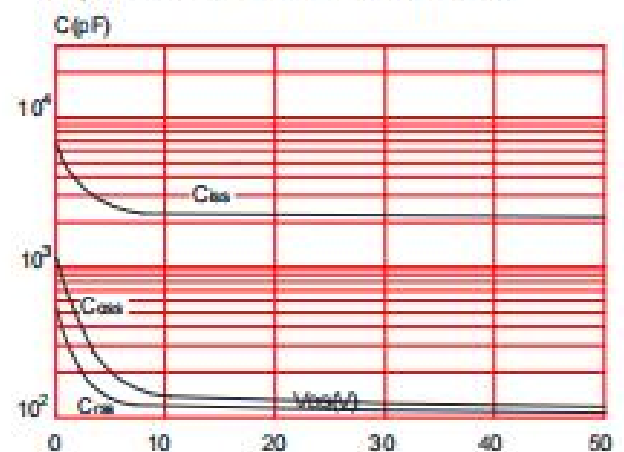


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

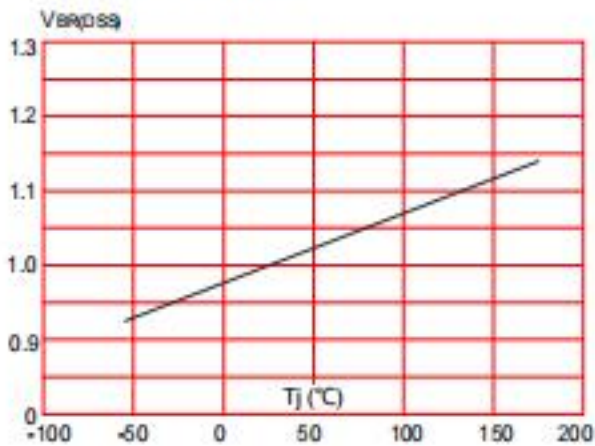


Figure 8: Normalized on Resistance vs. Junction Temperature

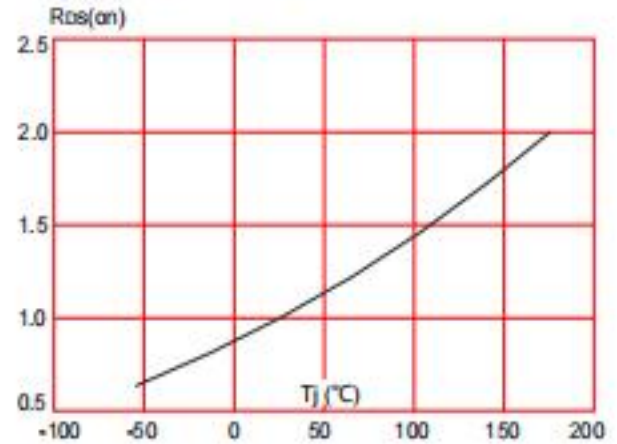


Figure 9: Maximum Safe Operating Area

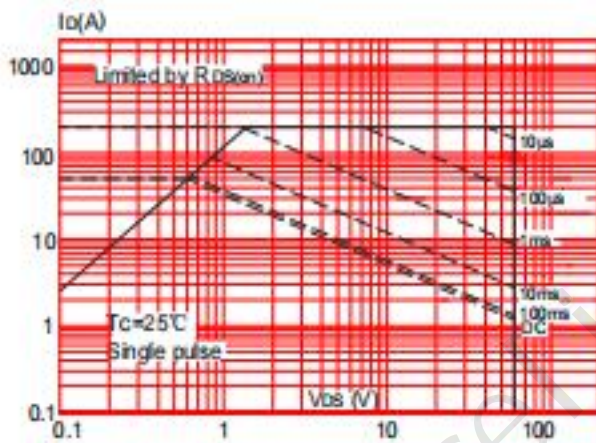


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

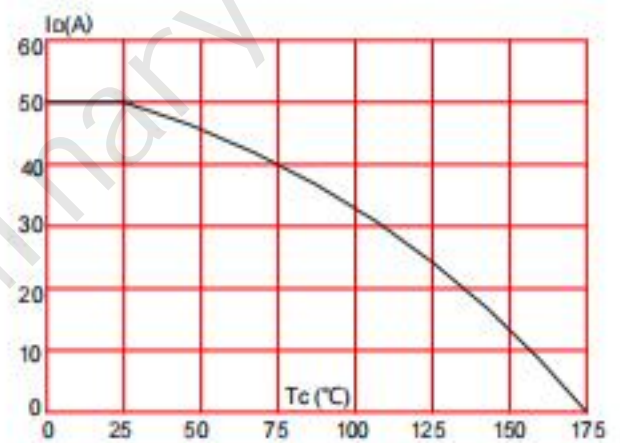
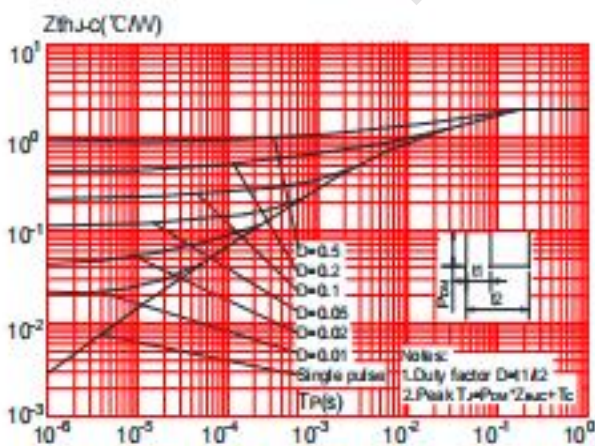


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuits and Waveforms

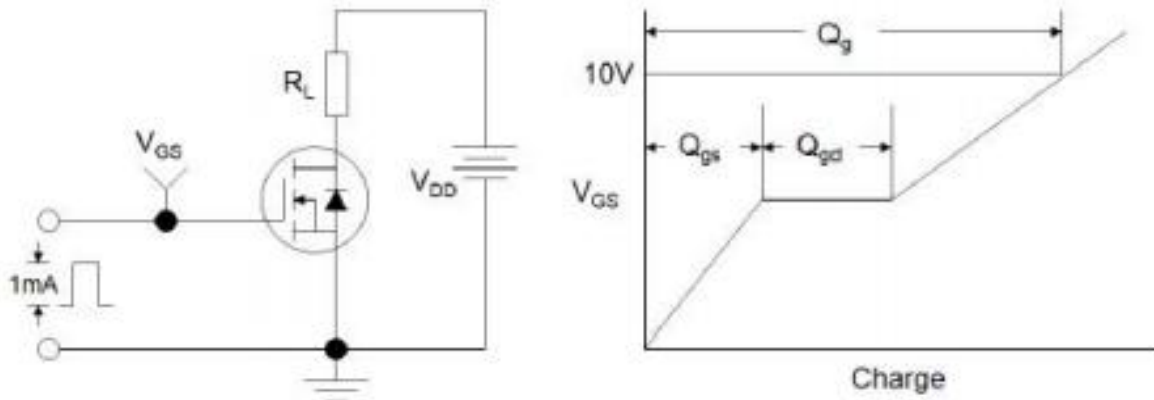


Figure1:Gate Charge Test Circuit & Waveform

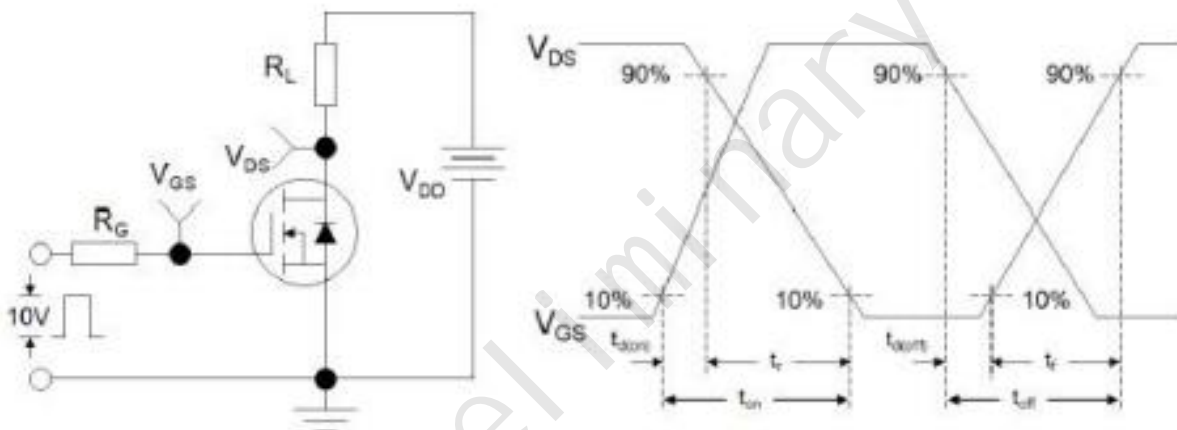


Figure 2: Resistive Switching Test Circuit & Waveforms

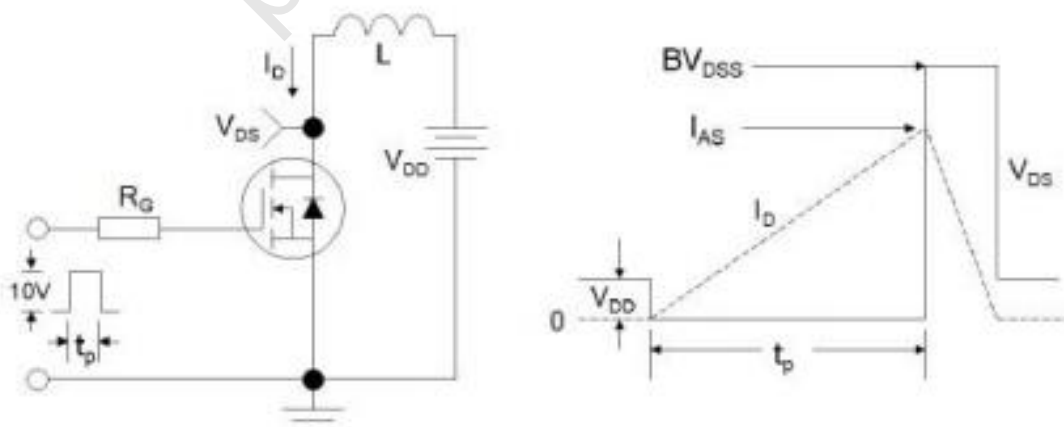
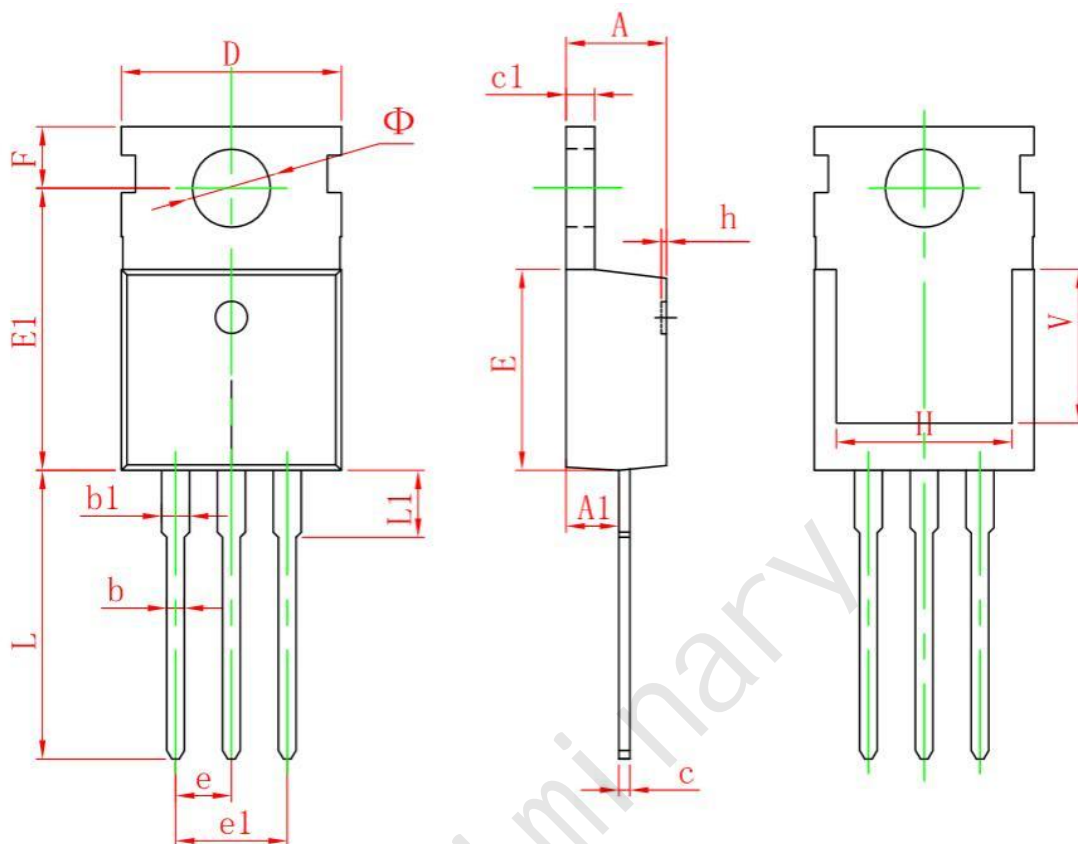


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Package outline drawing(TO-220 Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

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