

Description

The PSMT015R4H uses split gate trench technology to provide excellent $R_{DS(on)}$ and low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

MOSFET Product Summary

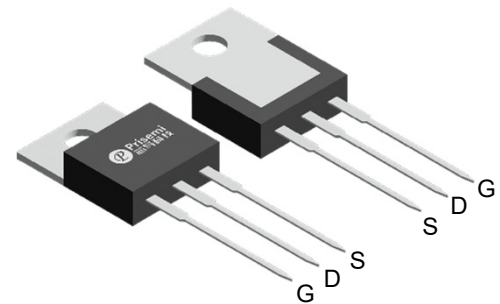
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
150	4.2@ $V_{GS} = 10V$	185

Feature

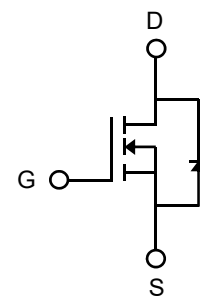
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Applications

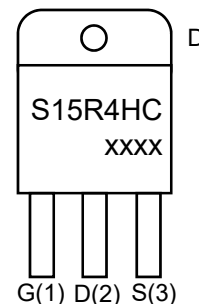
- PWM applications
- Load Switch
- Power Management
- DC-DC Converters
- Wireless Chargers



TO-220



Circuit Diagram



Marking (Top View)

Absolute maximum rating@25°C

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ¹⁾	$T_C = 25^\circ C$	I_D	185	A
	$T_C = 100^\circ C$		125	
Pulsed Drain Current ²⁾		I_{DM}	740	A
Total Power Dissipation ³⁾		P_D	312	W
Avalanche Current ⁴⁾		I_{AS}	88	A
Avalanche Energy ⁴⁾		E_{AS}	1970	mJ
Thermal Resistance , Junction-to-Case ⁵⁾		$R_{\theta JC}$	0.4	$^\circ C/W$
Thermal Resistance Junction-to-Ambient ⁶⁾		$R_{\theta JA}$	50	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ C$

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D = 250μA	150	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 150V,V _{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V,V _{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} ,I _D = 250μA	2.5	3.4	4.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V,I _D = 20A	-	4.2	5.0	mΩ
Dynamic Characteristics ⁷⁾						
Input Capacitance	C _{iss}	V _{DS} = 75V,V _{GS} = 0V, f = 1.0MHz	-	6100	-	pF
Output Capacitance	C _{oss}		-	727	-	
Reverse Transfer Capacitance	C _{rss}		-	13	-	
Switching Characteristics ⁷⁾						
Turn-on Delay Time	t _{d(on)}	V _{DS} = 75V, V _{GS} = 10V, I _D = 20A,R _{GEN} = 3Ω	-	30	-	ns
Turn-on Rise Time	t _r		-	50	-	
Turn-Off Delay Time	t _{d(off)}		-	64	-	
Turn-Off Fall Time	t _f		-	44	-	
Total Gate Charge	Q _g	V _{DS} = 75V, V _{GS} = 10V, I _D = 20A	-	89	-	nC
Gate-Source Charge	Q _{gs}		-	32	-	
Gate-Drain Charge	Q _{gd}		-	31	-	
Gate Resistance	R _g	V _{GS} =0V,V _{DS} =0V,f=1MHz	-	2.5	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V,I _S = 2A	-	0.7	1.2	V

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. Repetitive Rating: Pulse width limited by maximum junction temperature($T_{J_Max}=150^\circ C$).
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. This single-pulse measurement was taken under the following condition [$L=0.5mH, V_{GS}=10V, V_{DS}=100V$] while it's value is limited by $T_{J_Max}=150^\circ C$.
5. Device mounted on infinite heatsink.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
7. Guaranteed by design, not subject to production.

Typical Characteristics

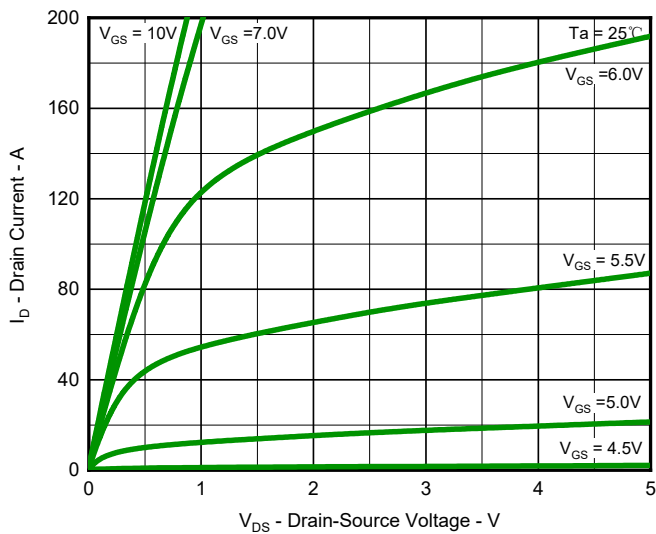


Fig.1 Output Characteristics

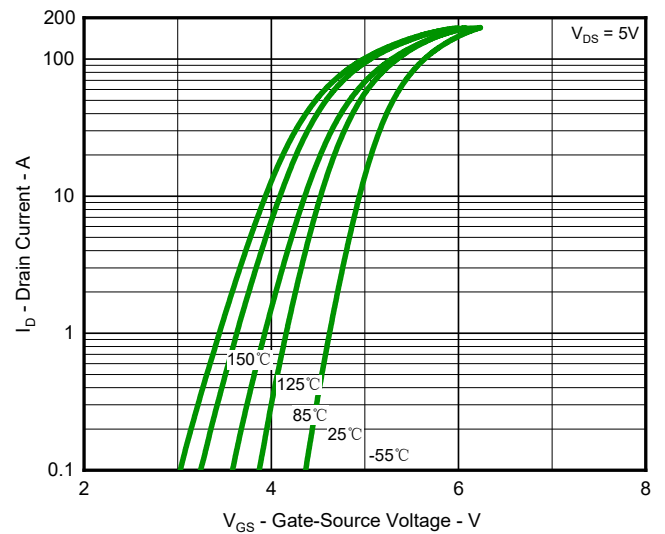


Fig.2 Typical Transfer Characteristic

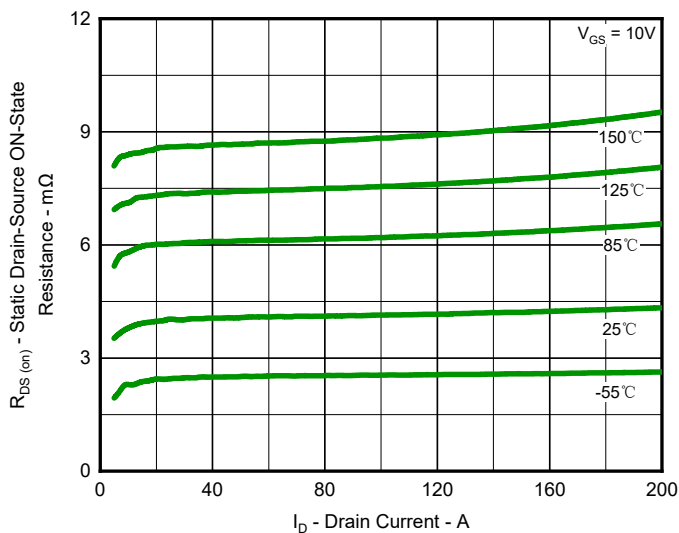


Fig.3 Typical On-Resistance vs Drain Current and Temperature

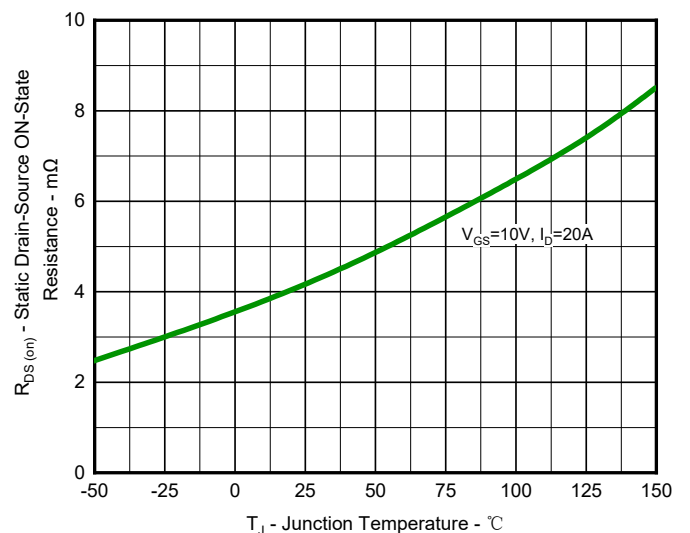


Fig.4 On-Resistance Variation with Temperature

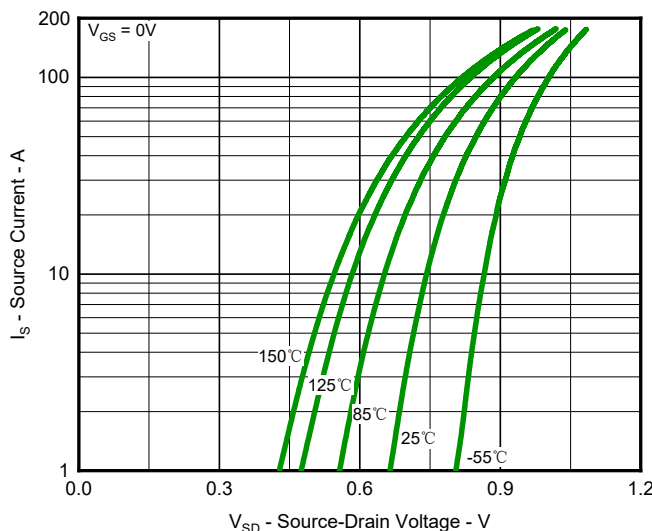


Fig.5 Diode Forward Voltage vs. Current

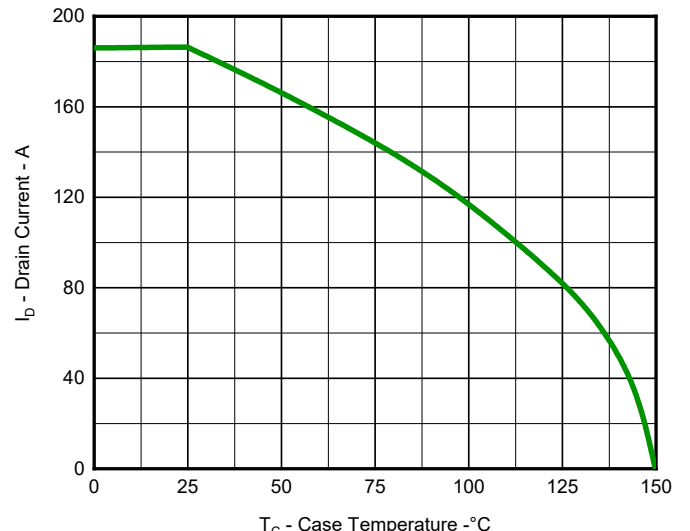


Fig.6 Maximum Drain Current vs. Case Temperature

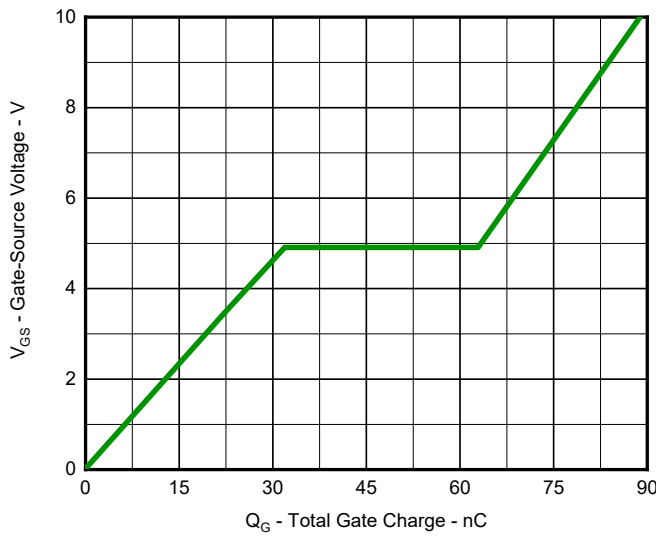


Fig.7 Gate Charge Characteristics

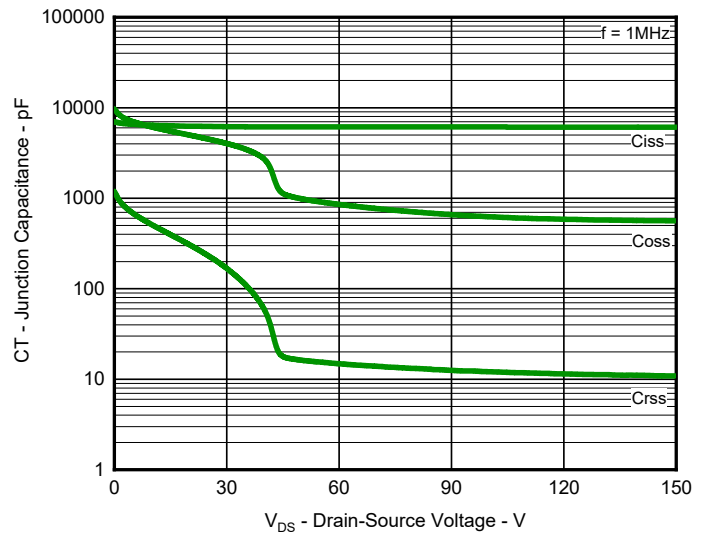


Fig.8 Typical Junction Capacitance

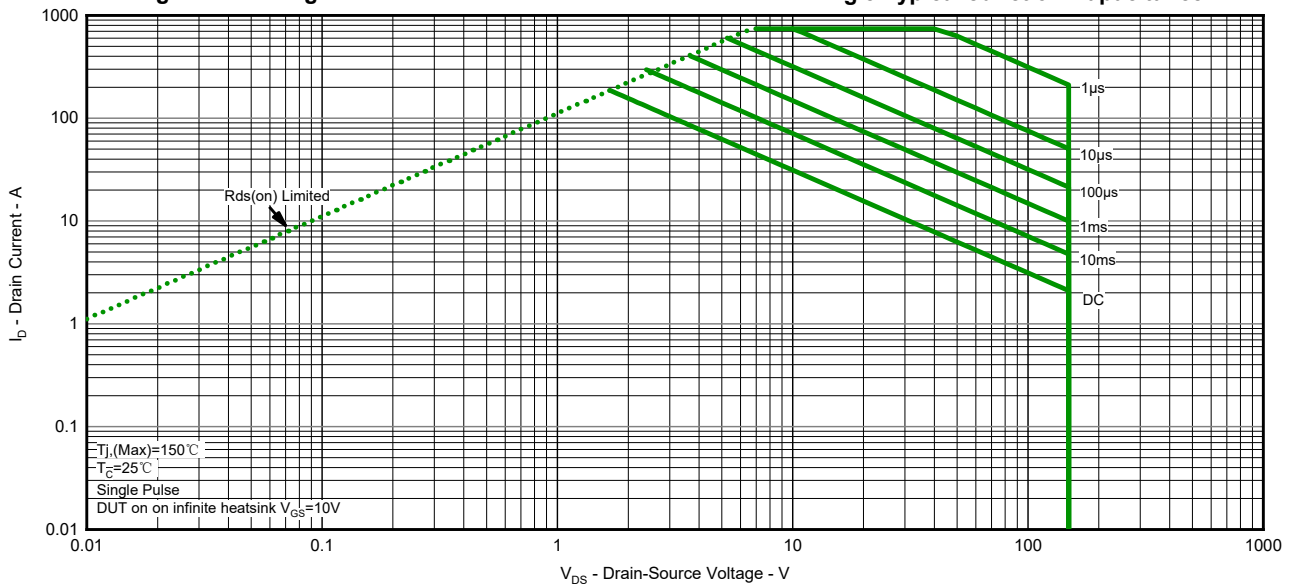


Fig.9 Safe Operation Area

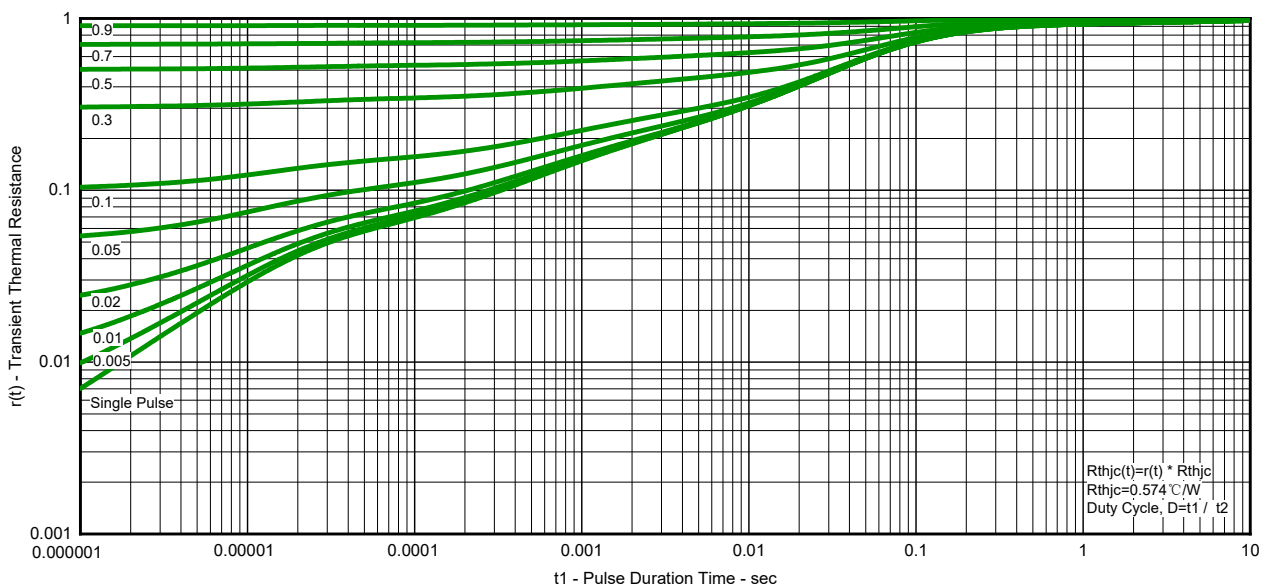
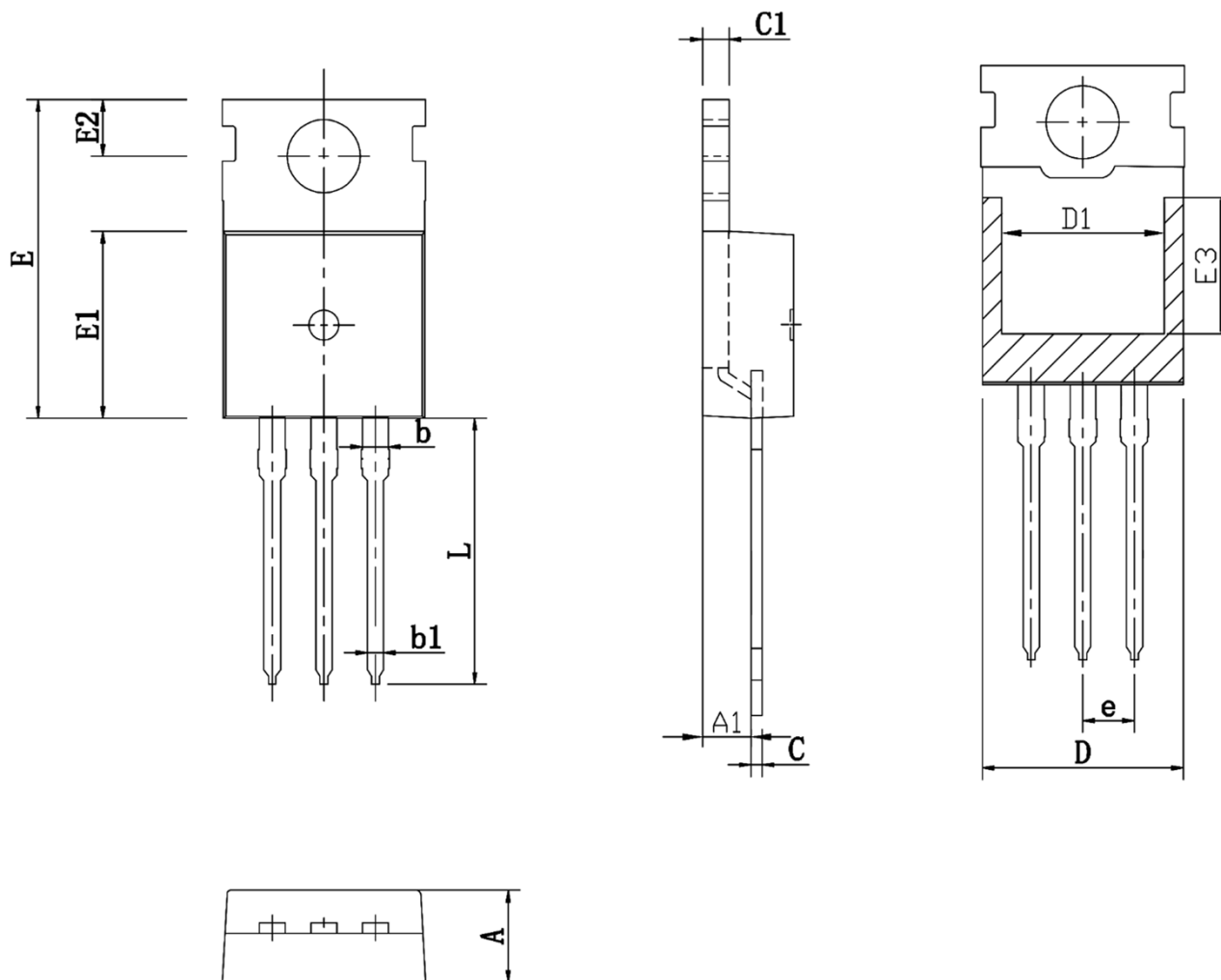


Fig.10 Transient Thermal Resistance

Product Dimension (TO-220)



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	4.40	4.60	0.173	0.181	D1	7.942	7.97	0.313	0.314
A1	2.00	3.00	0.079	0.118	E	15.20	15.75	0.598	0.620
b	1.20	1.36	0.047	0.054	E1	9.00	9.40	0.354	0.370
b1	0.70	0.90	0.028	0.035	E2	2.60	2.90	0.102	0.114
C	0.48	0.53	0.019	0.021	E3	7.247	7.587	0.285	0.299
C1	1.28	1.32	0.050	0.052	e	2.54	Ref.	0.354	0.362
D	9.80	10.20	0.386	0.402	L	13.00	13.40	0.512	0.528

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