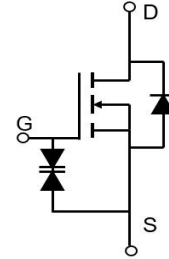


N-Channel Enhancement Mosfet

General Features

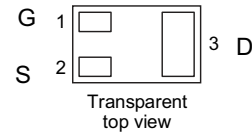
- 30V, 0.5A
 $R_{DS(ON)}$ Typ = 515m Ω @ $V_{GS} = 4.5V$
 $R_{DS(ON)}$ Typ = 615m Ω @ $V_{GS} = 2.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- ESD Protected: G-S > 2KV



Schematic diagram

Application

- Load Switch
- Power Management
- Halogen-free



DFN1006 (SOT883)

Package Marking And Ordering Information

Device Marking	Device	Device Package	Packaging Code	Reel Size	Quantity (PCS)
0530	RM05N30ED1	DFN1006	-T	7inch	10000

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current-Continuous	I_D	0.5	A
Drain Current-Pulsed ^(Note 1)	I_{DM}	2	A
Maximum Power Dissipation	P_D	0.35	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^{\circ}C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	357	$^{\circ}C/W$
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Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu A, V_{GS} = 0V$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 10V$	-	-	± 10	μA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.4	0.7	1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 0.2A$	-	515	650	$m\Omega$
		$V_{GS} = 2.5V, I_D = 0.15A$	-	615	800	$m\Omega$
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 15V,$ $f = 1MHz$	-	27	-	pF
Output Capacitance	C_{oss}		-	6	-	pF
Reverse Transfer Capacitance	C_{rss}		-	3	-	pF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 30V$ $I_D = 0.5A, R_{GEN} = 10\Omega$	-	2	-	ns
Turn-on Rise Time	t_r		-	14	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	6	-	ns
Turn-Off Fall Time	t_f		-	9	-	ns
Total Gate Charge	Q_g	$V_{GS} = 0 \text{ to } 4.5V$ $V_{DS} = 15V, I_D = 0.3A$	-	1.6	-	nC
Gate-Source Charge	Q_{gs}		-	0.2	-	nC
Gate-Drain Charge	Q_{gd}		-	0.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 0.5A$	-	-	1.2	V
Diode Forward Current	I_S		-	-	0.5	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

RATING AND CHARACTERISTICS CURVES (RM05N30ED1)

Figure 1: Output Characteristics

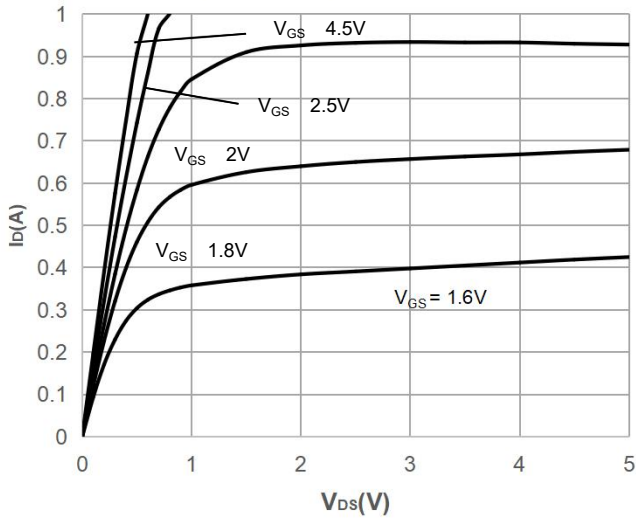


Figure 2: Typical Transfer Characteristics

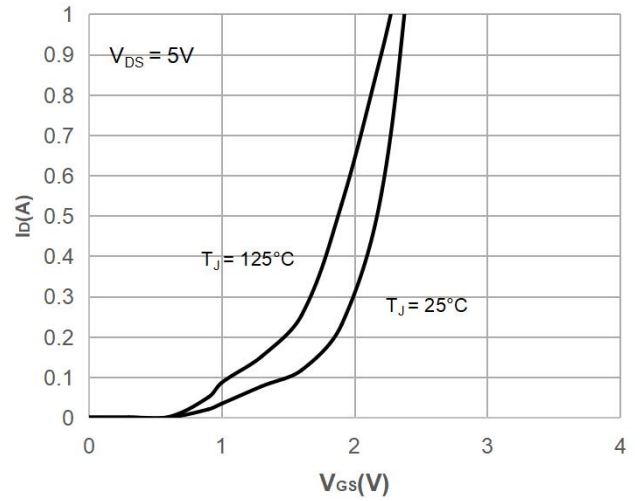


Figure 3: On-resistance vs. Drain Current

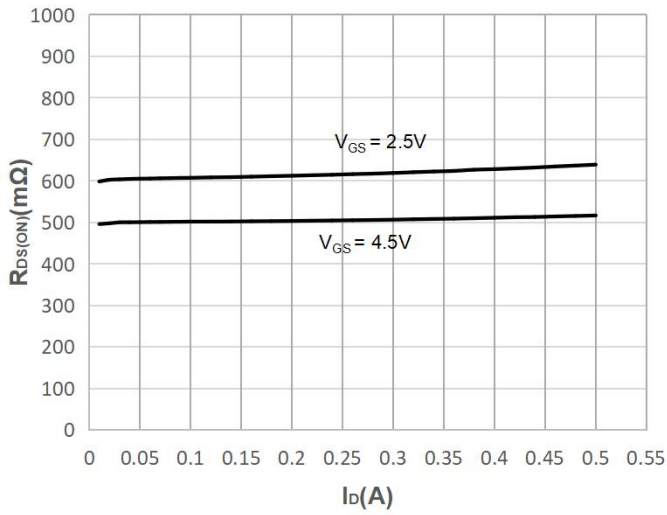


Figure 4: Body Diode Characteristics

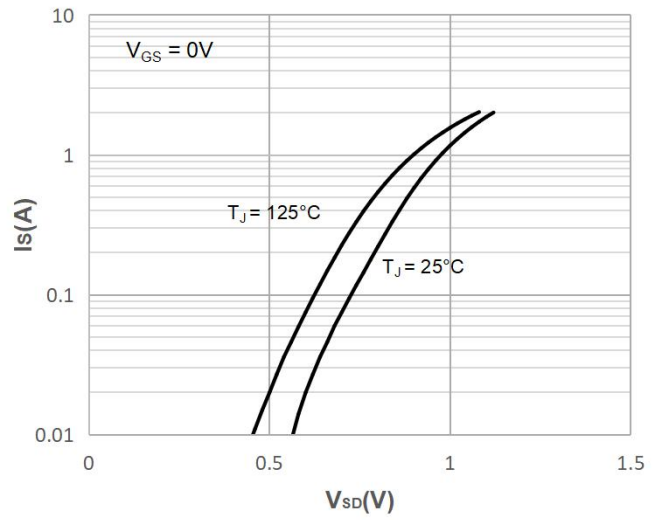


Figure 5: Gate Charge Characteristics

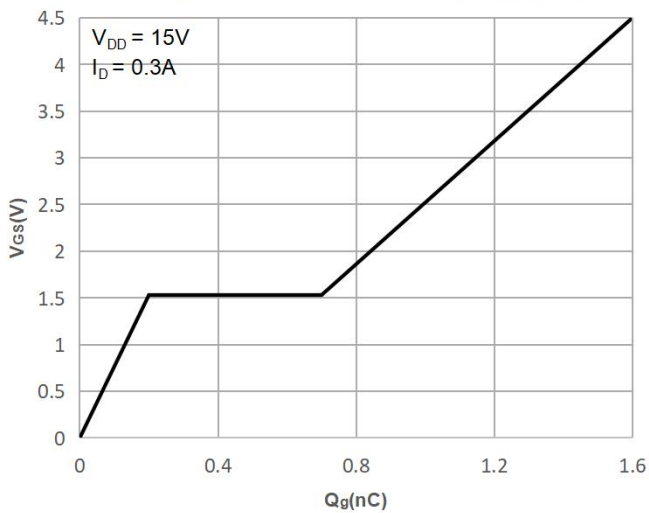
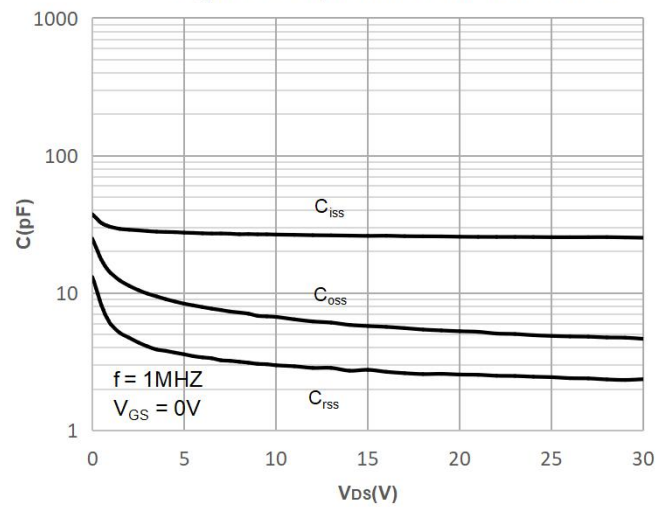


Figure 6: Capacitance Characteristics



RATING AND CHARACTERISTICS CURVES (RM05N30ED1)

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

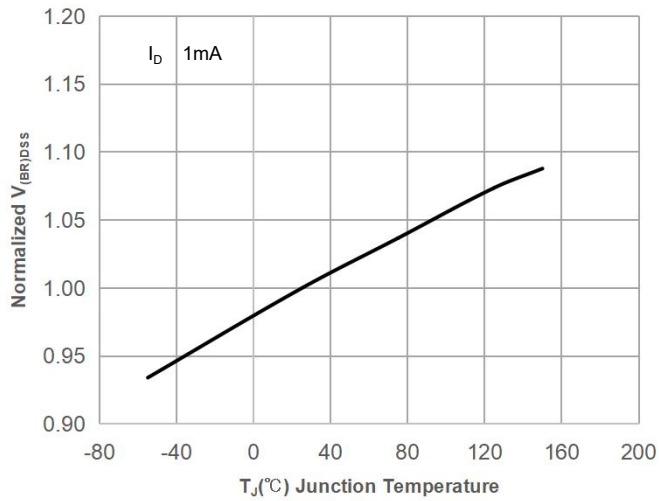


Figure 8: Normalized on Resistance vs. Junction Temperature

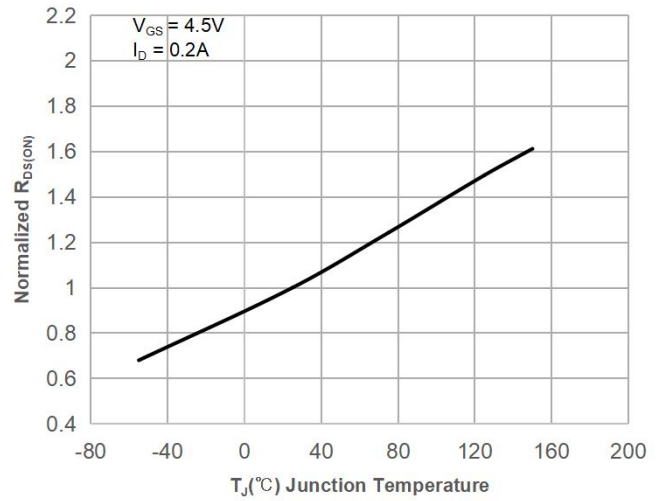


Figure 9: Maximum Safe Operating Area

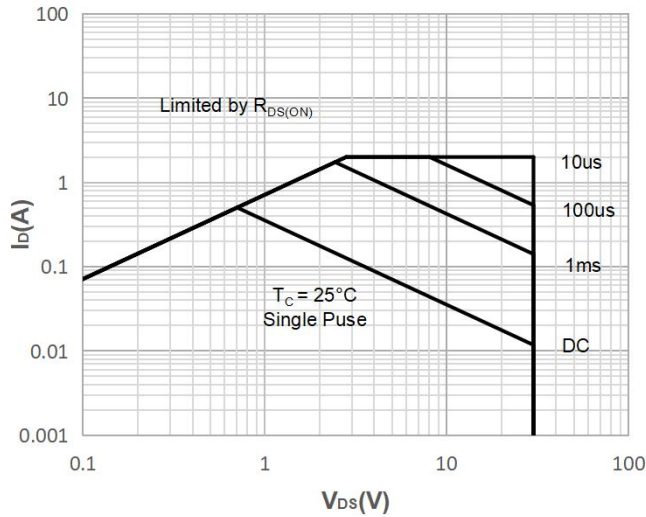


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

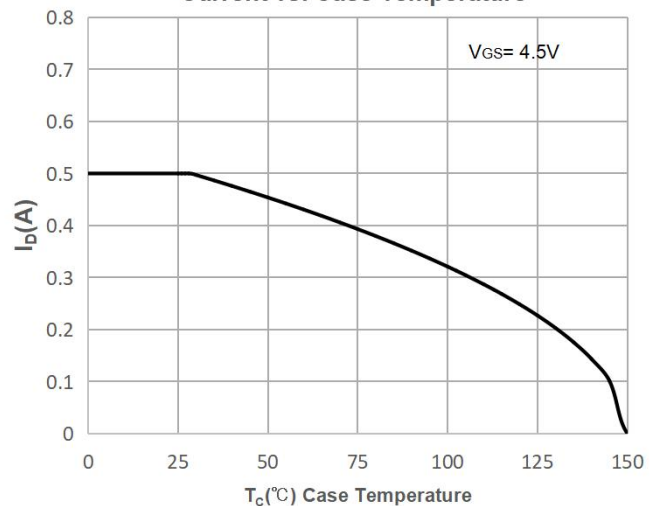


Figure 11: Normalized Maximum Transient Thermal Impedance

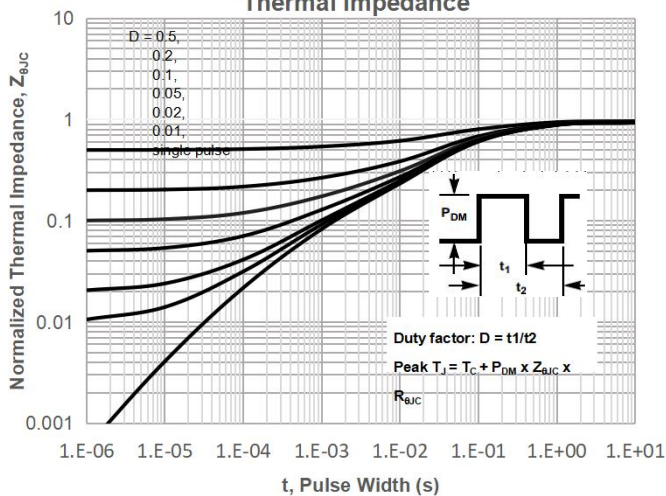
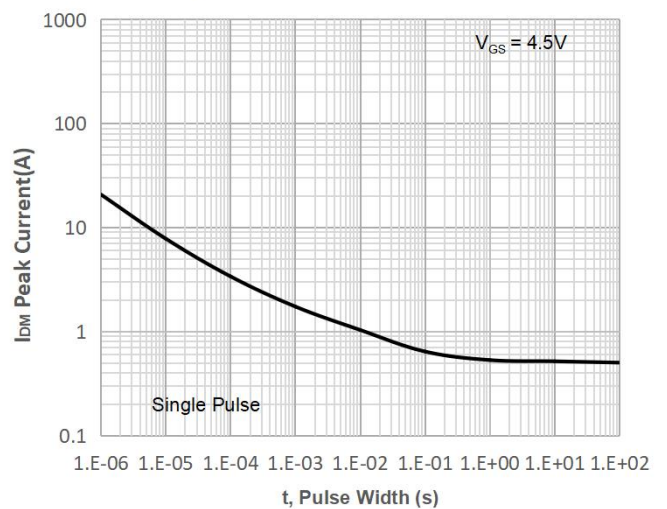


Figure 12: Peak Current Capacity



Test Circuit

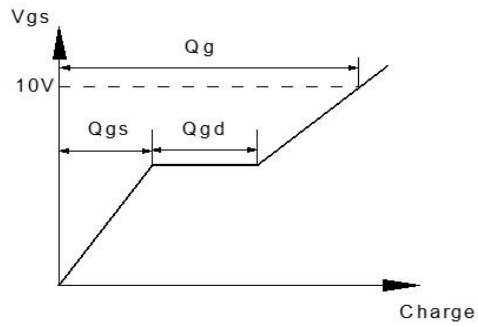
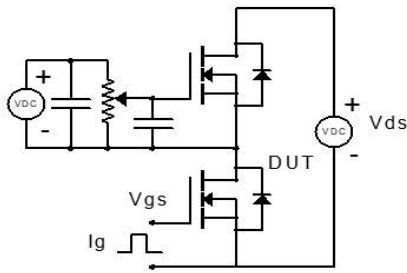


Figure 1: Gate Charge Test Circuit & Waveform

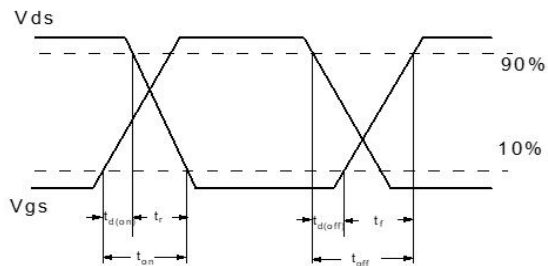
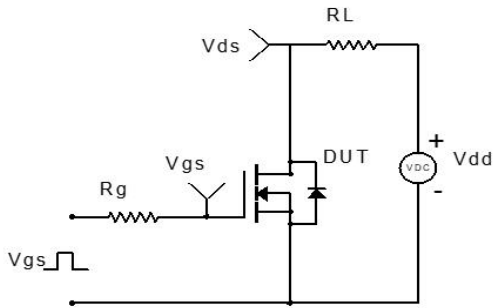


Figure 2: Resistive Switching Test Circuit & Waveform

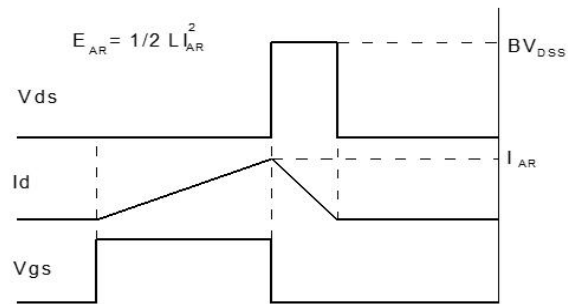
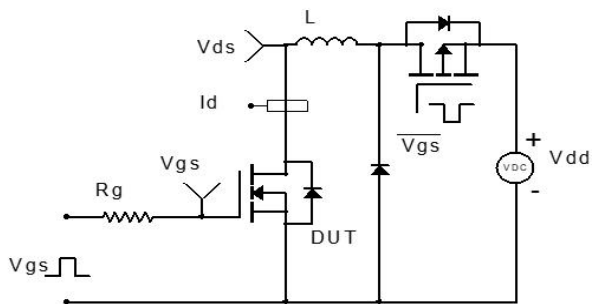


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

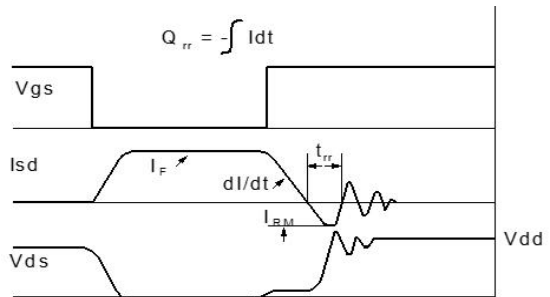
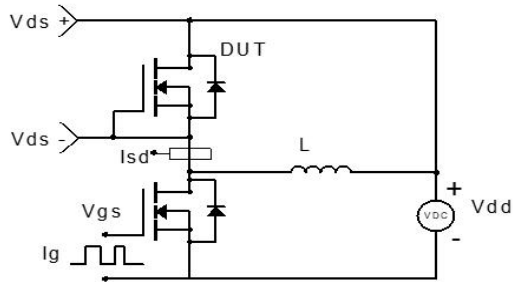
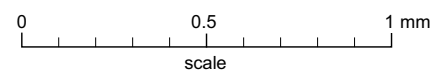
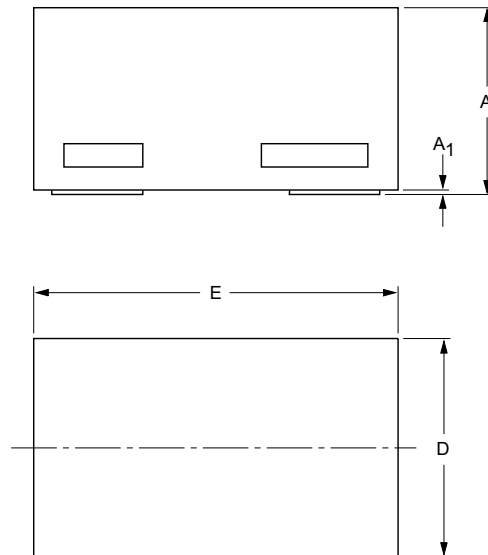
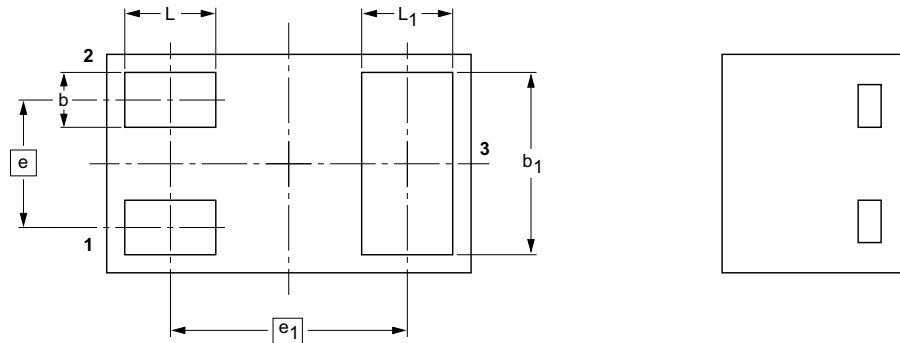


Figure 4: Diode Recovery Test Circuit & Waveform

DFN1006 Package Information



DIMENSIONS (mm are the original dimensions)

UNIT	A ⁽¹⁾	A ₁ max.	b	b ₁	D	E	e	e ₁	L	L ₁
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

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