



General Description

The UV3012DN uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for use in PWM, load switching and general purpose applications.

Features

Enhancement Mode

Enhanced Body diode dv/dt capability

100% Avalanche Tested

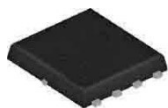
V_{DS}	30	V
$R_{DS(on)type@V_{GS}=10V}$	12	m Ω
$R_{DS(on)type@V_{GS}=4.5V}$	16	m Ω
I_D	30	A

Applications

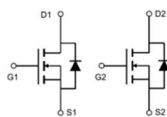
Power switching application

Hard Switched and High Frequency Circuits

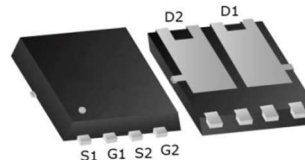
Uninterruptible Power Supply



DFN3*3-8L Top view



Schematic diagram



Package Marking And Ordering Information

Part ID	Package Type	Marking	Tape and Reel information
UV3012DN	DFN3*3-8L	UV3012DN	5000pcs/Reel

Maximum ratings, at $T_j=25^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain –Source breakdown voltage		30	V
I_D	Continuous drain current (Silicon Limited)	$T_c=25^{\circ}\text{C}$	30	A
		$T_c=75^{\circ}\text{C}$	18	A
I_{DM}	Pulse drain current tested①	$T_c=25^{\circ}\text{C}$	57	A
E_{AS}	Avalanche energy, single pulsed②		12	mJ
P_D	Maximum power dissipation	$T_c=25^{\circ}\text{C}$	2.6	W
V_{GS}	Gate-Source voltage		± 20	V
$T_{STG} T_J$	Storage and operating temperature range		-55 to 150	$^{\circ}\text{C}$



Thermal Characteristic

Symbol	Parameter	Typical	Unit
R_{QJC}	Thermal Resistance-Junction to Case	0.8	$^{\circ}\text{C}/\text{W}$
R_{QJA}	Thermal Resistance-Junction to Ambient	40	$^{\circ}\text{C}/\text{W}$

Typical Characteristics

Symbol	Parameter	Condition	Min	Type	Max	Unit
Static Electrical Characteristics @T _j =25 $^{\circ}\text{C}$ (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$			± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.2		2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	$V_{GS}=10\text{V}$, $I_D=10\text{A}$		12	14	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=8\text{A}$		16	19	m Ω
G_{fs}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=15\text{A}$		9		S
Dynamic Electrical Characteristics @T _j =25 $^{\circ}\text{C}$ (unless otherwise stated)						
C_{iss}	Input Capacitance	$V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $F=1\text{MHz}$		540		PF
C_{oss}	Output Capacitance			95		PF
C_{rss}	Reverse Transfer Capacitance			68		PF
R_g	Gate resistance	$F=1.0\text{MHz}$		1.4		Ω
Q_g	Total Gate Charge	$V_{DS}=15\text{V}$, $I_D=12\text{A}$, $V_{GS}=10\text{V}$		10.6		nC
Q_{gs}	Gate-Source Charge			1.9		nC
Q_{gd}	Gate-Drain Charge			2.1		nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay time	$V_{DS}=15\text{V}$		4		nS
t_r	Turn-on Rise time	$R_L=1\Omega$		17		nS
$t_{d(off)}$	Turn-off Delay time	$R_G=3\Omega$		18		nS
t_f	Turn-off Fall time	$V_{GS}=10\text{V}$		9		nS
Source-Drain Diode Characteristics						
V_{SD}	Forward voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$			1.2	V

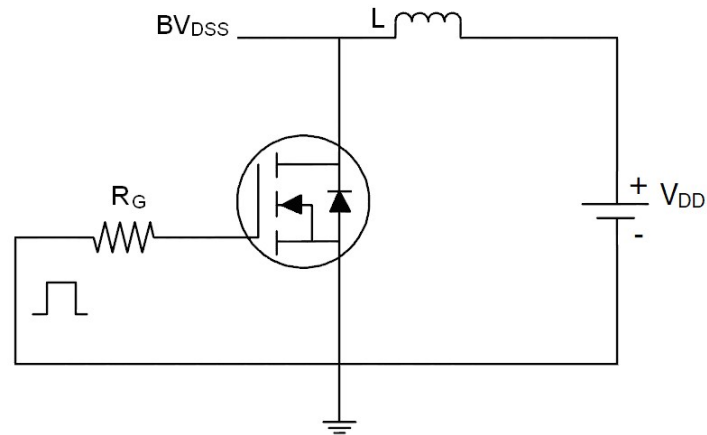
Note:

- ① Repetitive rating; pulse width limited by max, junction temperature.
- ② Limited by T_{Jmax}, starting T_J=25 $^{\circ}\text{C}$, L=0.1mH, R_G=25 Ω , I_{AS}=10A, V_{DD}=24V, Part not recommended for use above this value
- ③ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$

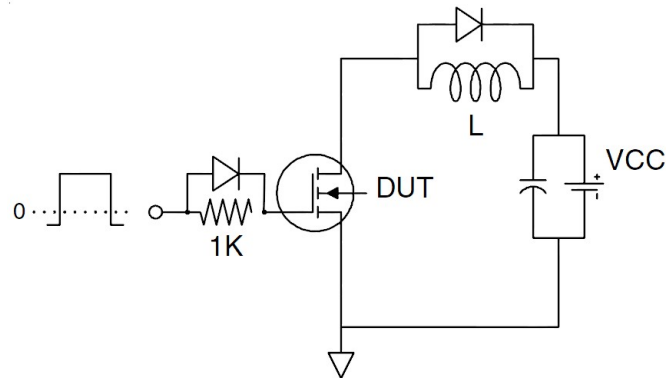


Test circuit

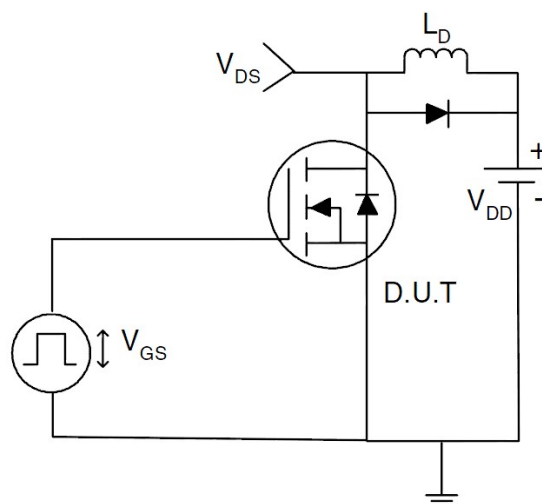
(1) E_{AS} test circuits



(2) Gate charge test circuit

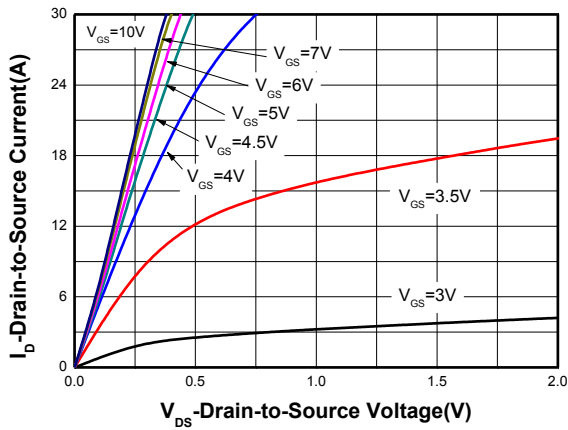


(3) Switch time test circuit

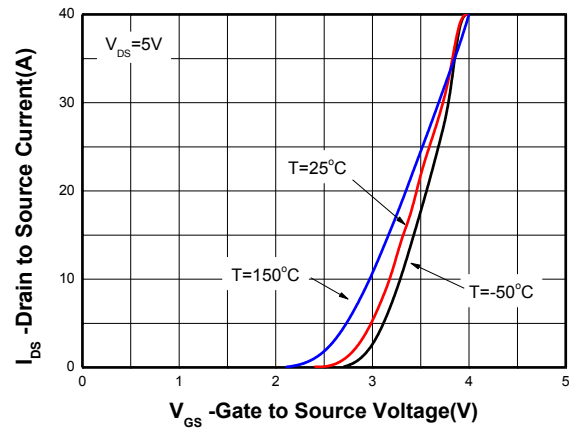




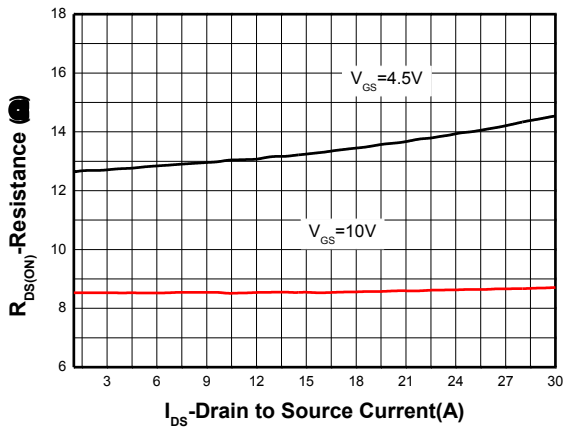
Typical Characteristics (Ta=25°C, unless otherwise noted)



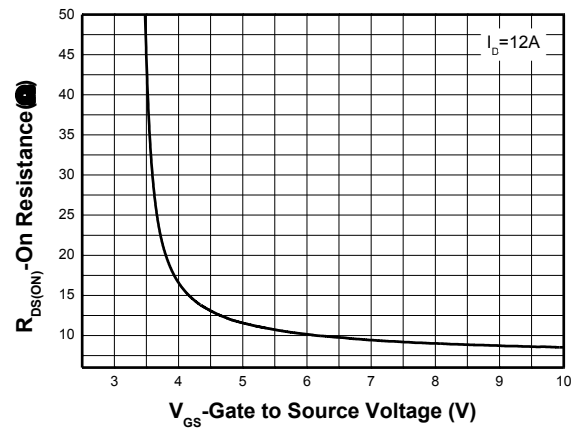
Output Characteristics ^d



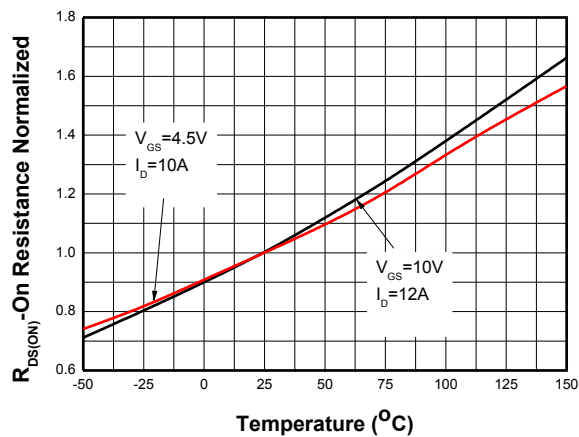
Transfer Characteristics ^d



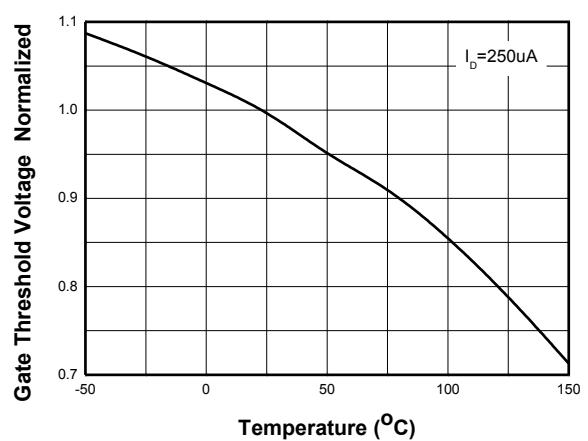
On-Resistance vs. Drain Current ^d



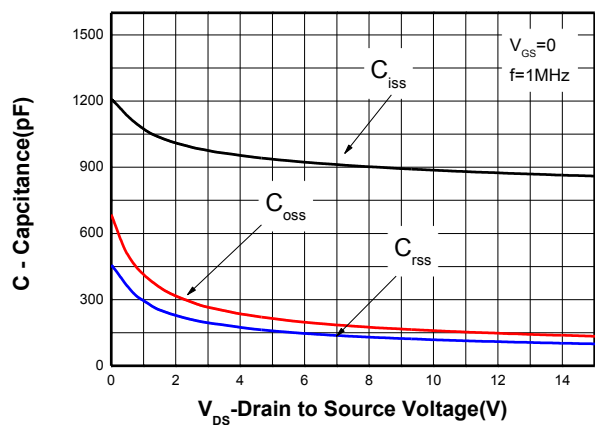
On-Resistance vs. Gate-to-Source Voltage ^d



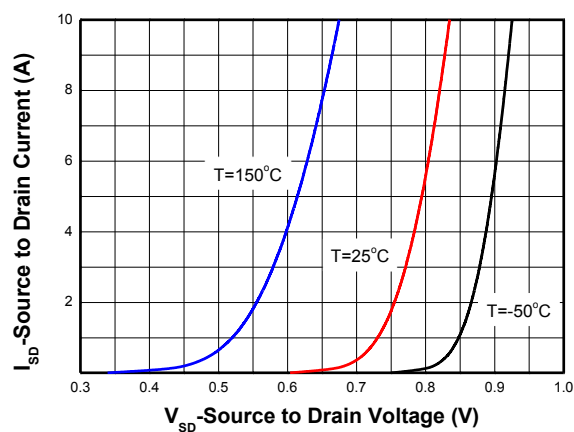
On-Resistance vs. Junction Temperature ^d



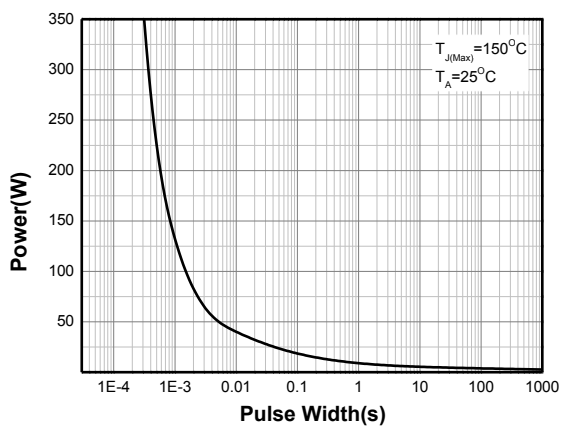
Threshold Voltage vs. Temperature



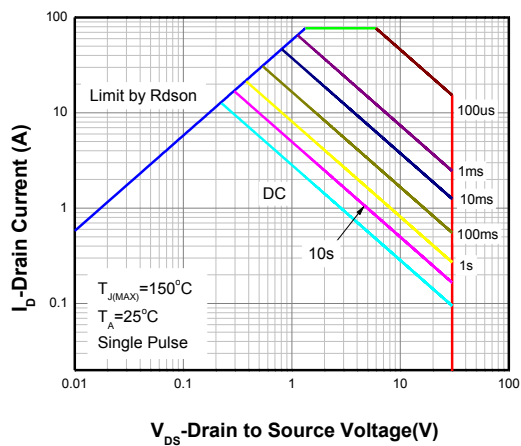
Capacitance



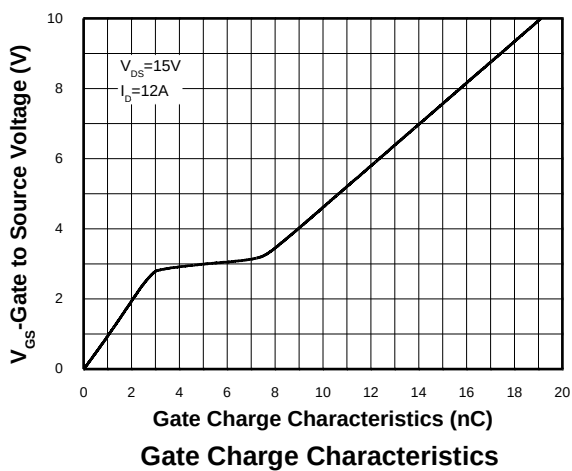
Body Diode Forward Voltage^d

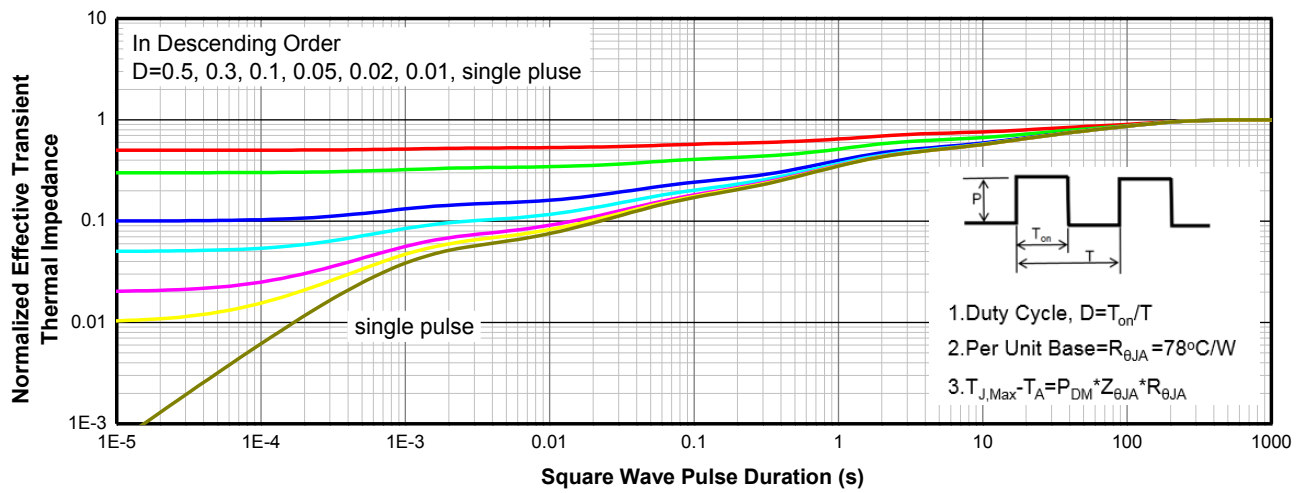


Single Pulse power

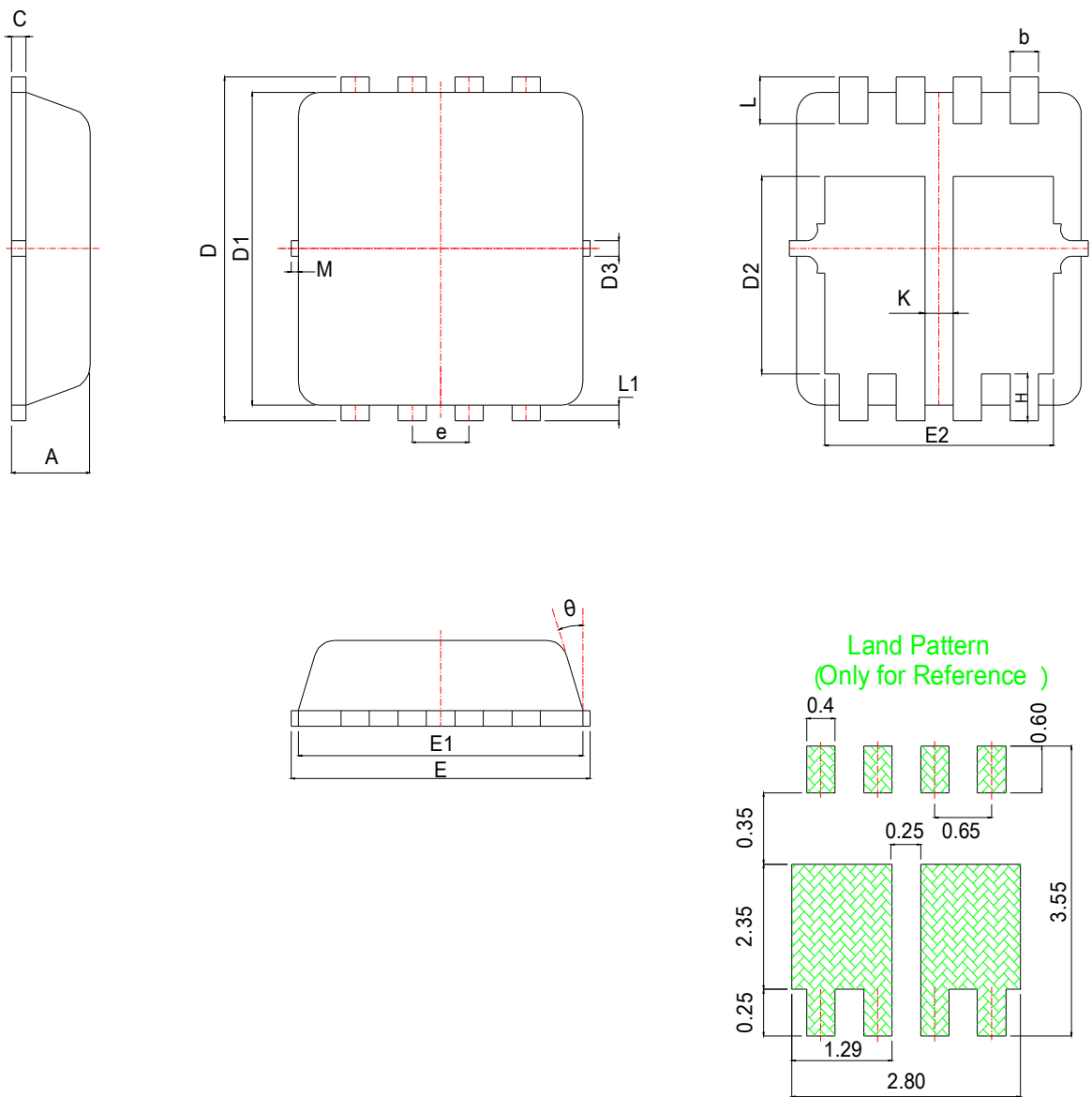


Safe Operating Power





Transient thermal response (Junction-to-Ambient)



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031	E1	3.00	3.15	3.20	0.118	0.122	0.126
b	0.25	0.30	0.35	0.010	0.012	0.014	E2	2.39	2.49	2.59	0.094	0.098	0.102
c	0.10	0.15	0.25	0.004	0.007	0.010	e	0.65BSC			0.026BSC		
D	3.25	3.35	3.45	0.128	0.132	0.136	H	0.30	0.40	0.50	0.012	0.016	0.020
D1	3.00	3.10	3.20	0.118	0.122	0.126	L	0.30	0.40	0.50	0.012	0.016	0.020
D2	1.78	1.88	1.98	0.070	0.074	0.078	L1	*	0.13	*	*	0.005	*
D3	*	0.13	*	*	0.005	*	theta	*	10°	12°	*	10°	12°
E	3.20	3.30	3.40	0.126	0.130	0.134	M	*	*	0.15	*	*	0.006
K	0.30	*	*	0.012	*	*							