

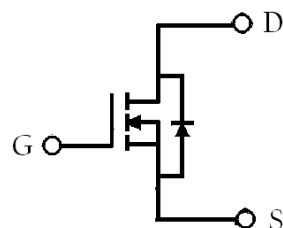
N -Channel Enhancement Mode Power MOSFET

Features:

- Low Gate Charge
- Simple Drive Requirement
- Pb-free lead plating and halogen-free package

Equivalent Circuit

KWU300N2013S

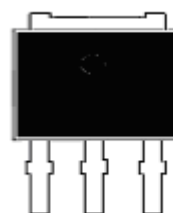


G : Gate D : Drain

S : Source

Outline

TO-251S



G D S

BV_{DSS}	200V
I_D@V_{GS}=10V, T_C=25°C	8.3A
R_{DS(ON)}@V_{GS}=10V, I_D=3A	294mΩ (typ)

Ordering Information

Device	Package	Shipping
KWU300N2013S	TO-251S (RoHS compliant and halogen-free package)	80 pcs/tube, 50 tubes/box

Absolute Maximum Ratings (TC=25 °C, unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 30	
Continuous Drain Current @ $T_C=25^\circ\text{C}$, $V_{GS}=10\text{V}$	I_D	8.3	A
Continuous Drain Current @ $T_C=100^\circ\text{C}$, $V_{GS}=10\text{V}$		5.3	
Pulsed Drain Current *1	I_{DM}	18	
Avalanche Current	I_{AS}	4	
Avalanche Energy @ $L=10\text{mH}$, $I_{AS}=4\text{A}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$ *3	E_{AS}	80	mJ
Repetitive Avalanche Energy @ $L=0.05\text{mH}$ *2	E_{AR}	5	
Total Power Dissipation @ $T_C=25^\circ\text{C}$	P_D	50	W
Total Power Dissipation @ $T_C=100^\circ\text{C}$		20	
Operating Junction and Storage Temperature Range	T_j, T_{stg}	$-55 \sim +150$	$^\circ\text{C}$

Note : *1. Pulse width limited by maximum junction temperature

*2. Duty cycle $\leq 1\%$

*3. 100% tested by conditions of $L=10\text{mH}$, $I_{AS}=3\text{A}$, $V_{GS}=10\text{V}$, $V_{DD}=50\text{V}$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	110	

Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	200	-	-	V	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$
$\Delta BV_{DSS}/\Delta T_j$	-	0.2	-	$\text{V}/^\circ\text{C}$	Reference to 25°C , $I_D=250\mu\text{A}$
$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$
G_{FS} *1	-	3.2	-	S	$V_{DS}=15\text{V}$, $I_D=2\text{A}$
I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30\text{V}$, $V_{DS}=0\text{V}$
I_{DSS}	-	-	1	μA	$V_{DS}=160\text{V}$, $V_{GS}=0\text{V}$
	-	-	25		$V_{DS}=160\text{V}$, $V_{GS}=0\text{V}$, $T_j=125^\circ\text{C}$
$R_{DS(ON)}$ *1	-	294	360	m Ω	$V_{GS}=10\text{V}$, $I_D=3\text{A}$
Dynamic					
Q_g *1, 2	-	10.2	-	nC	$I_D=3\text{A}$, $V_{DS}=160\text{V}$, $V_{GS}=10\text{V}$
Q_{gs} *1, 2	-	2.2	-		
Q_{gd} *1, 2	-	3.8	-		
$t_d(ON)$ *1, 2	-	8.8	-	ns	$V_{DS}=100\text{V}$, $I_D=3\text{A}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$
t_r *1, 2	-	17	-		
$t_d(OFF)$ *1, 2	-	21.2	-		
t_f *1, 2	-	20.4	-		

Ciss	-	373	-	pF	V _{GS} =0V, V _{DS} =25V, f=1MHz
Coss	-	46	-		
Crss	-	20	-		
Source-Drain Diode					
I _S *1	-	-	8.3	A	
I _{SM} *3	-	-	18		
V _{SD} *1	-	0.78	1.2	V	I _S =2A, V _{GS} =0V
trr	-	54	-	ns	I _F =3A, dI _F /dt=100A/μs
Qrr	-	105	-	nC	

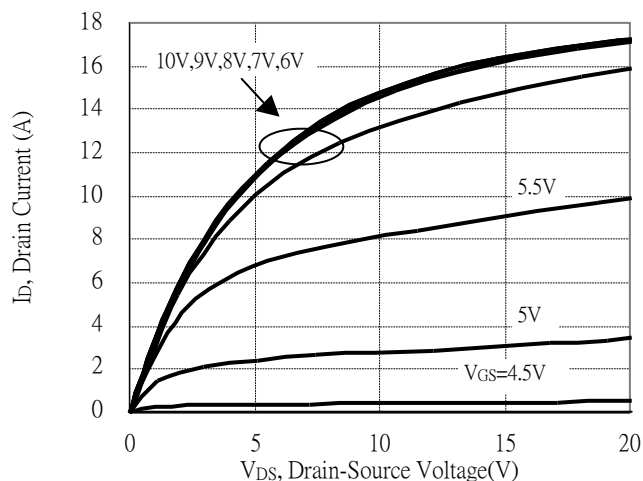
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

*2.Independent of operating temperature

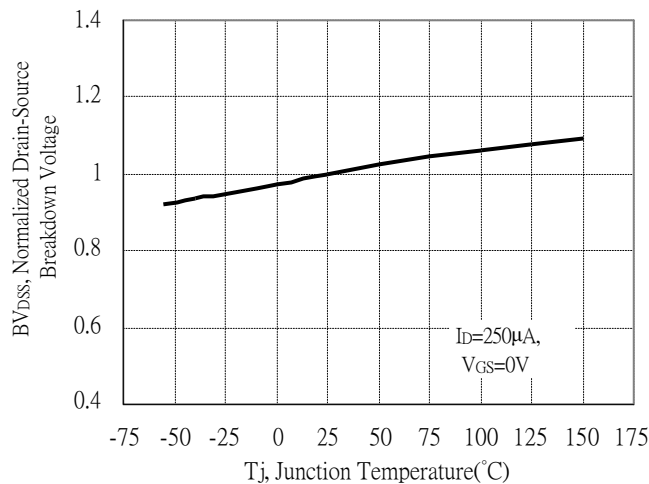
*3.Pulse width limited by maximum junction temperature.

Typical Characteristics

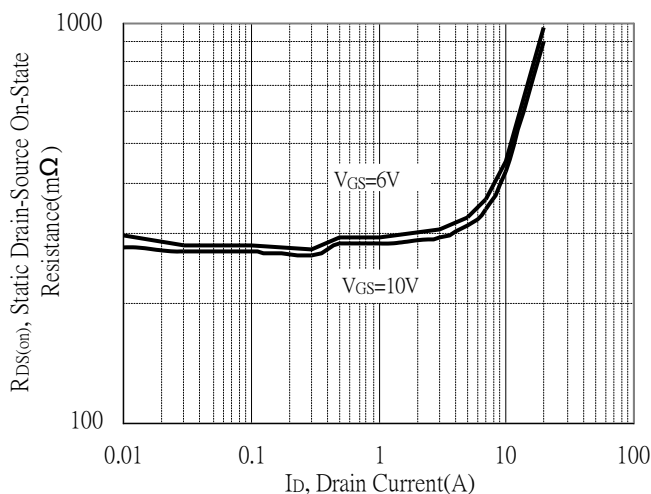
Typical Output Characteristics



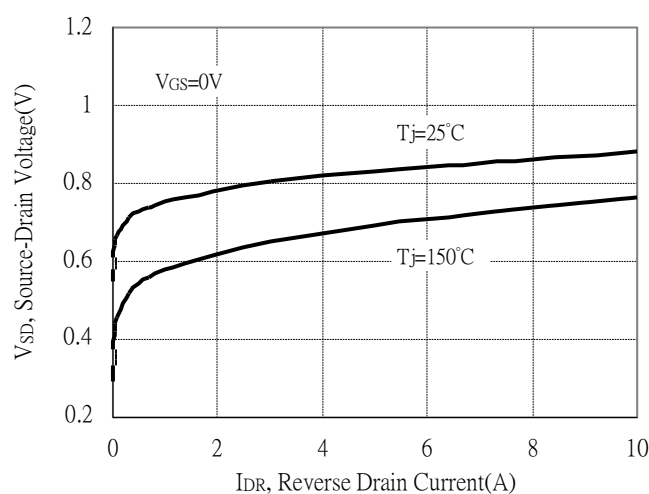
Breakdown Voltage vs Ambient Temperature



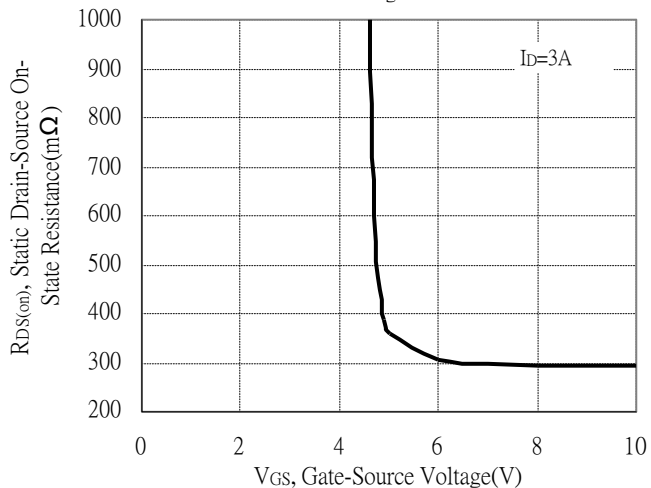
Static Drain-Source On-State resistance vs Drain Current



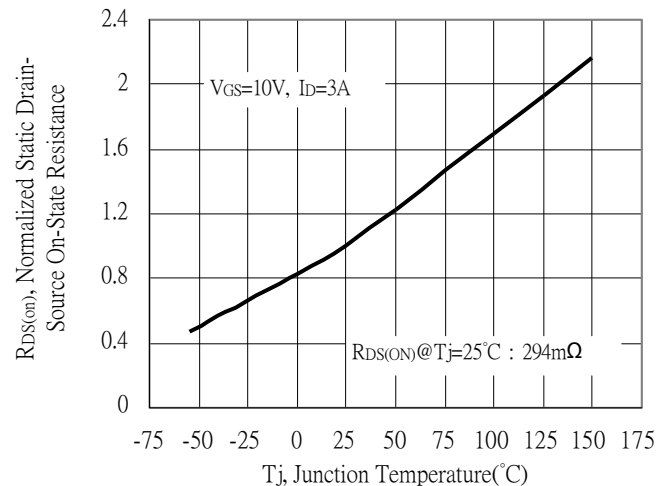
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

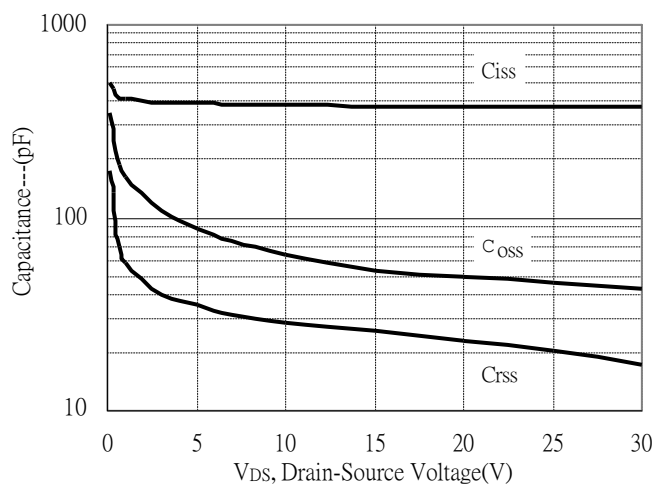


Drain-Source On-State Resistance vs Junction Temperature

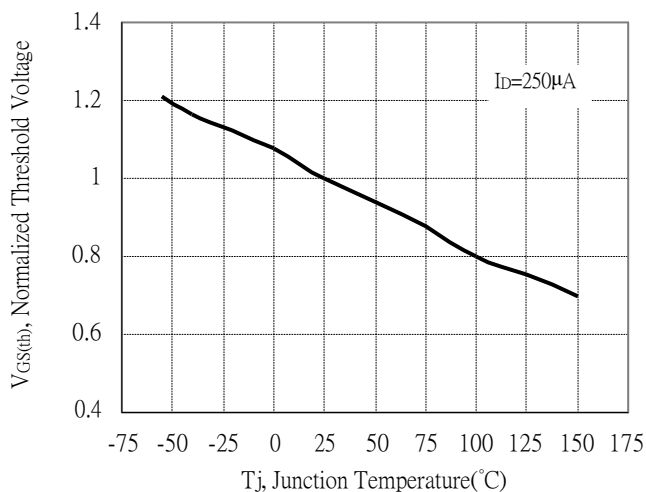


Typical Characteristics(Cont.)

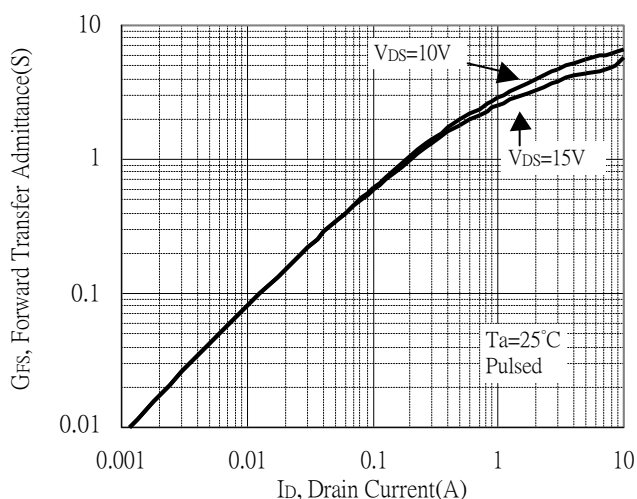
Capacitance vs Drain-to-Source Voltage



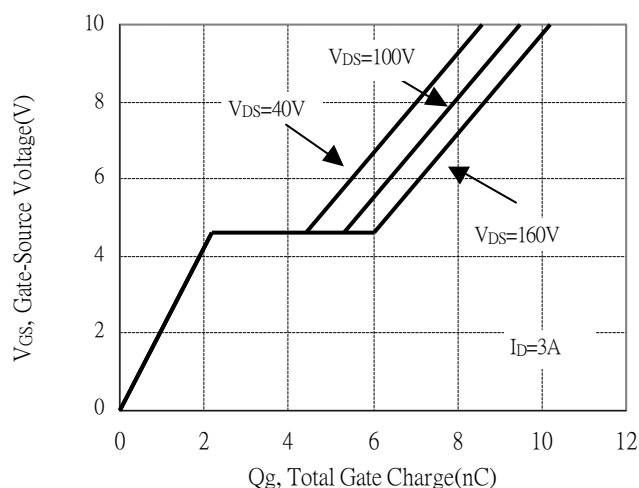
Threshold Voltage vs Junction Temperature



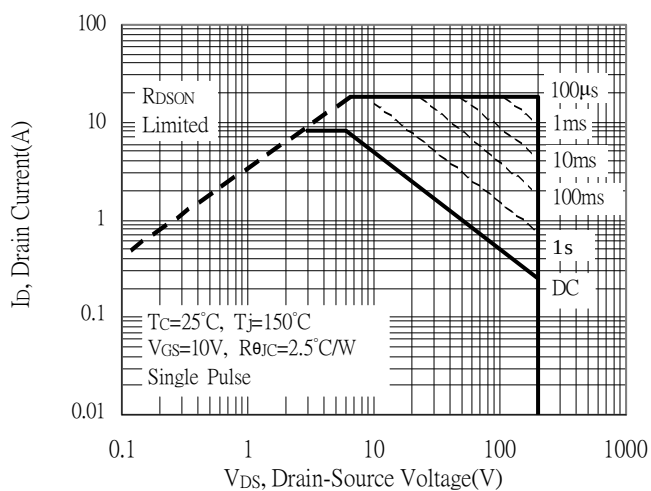
Forward Transfer Admittance vs Drain Current



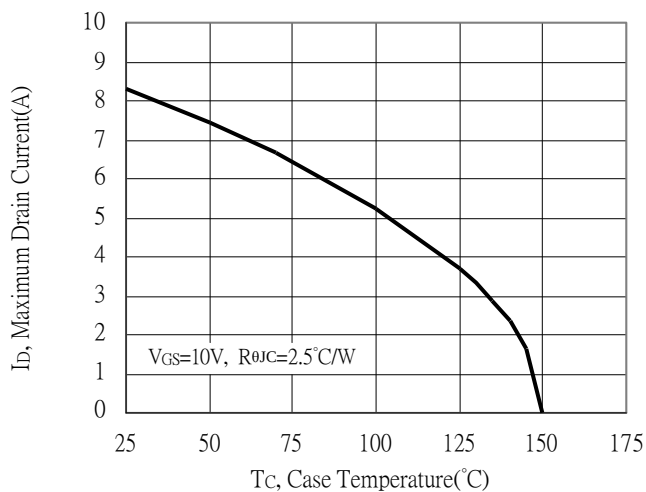
Gate Charge Characteristics



Maximum Safe Operating Area

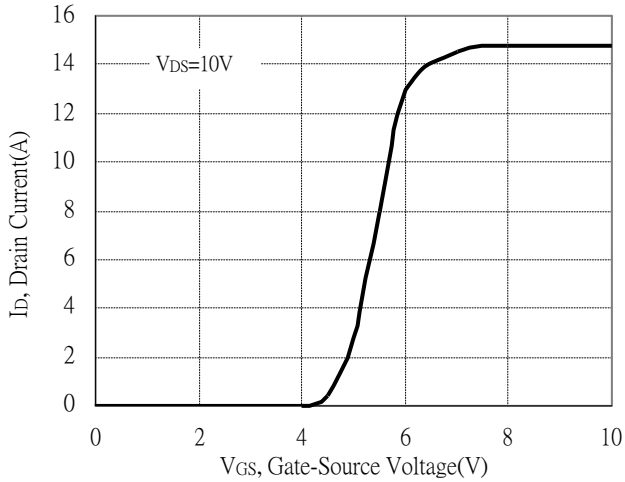


Maximum Drain Current vs Case Temperature

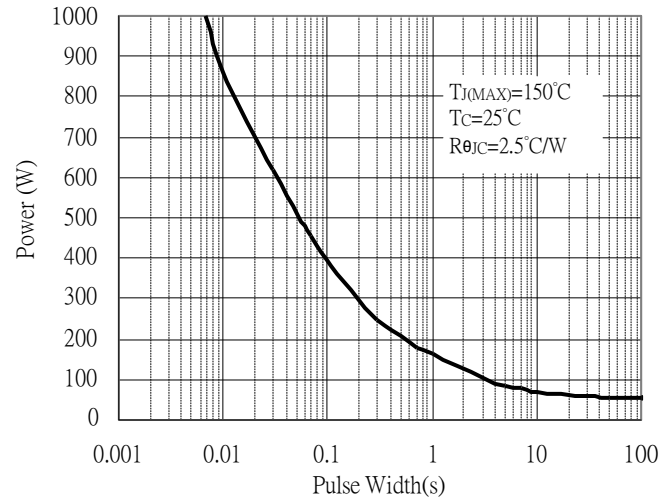


Typical Characteristics(Cont.)

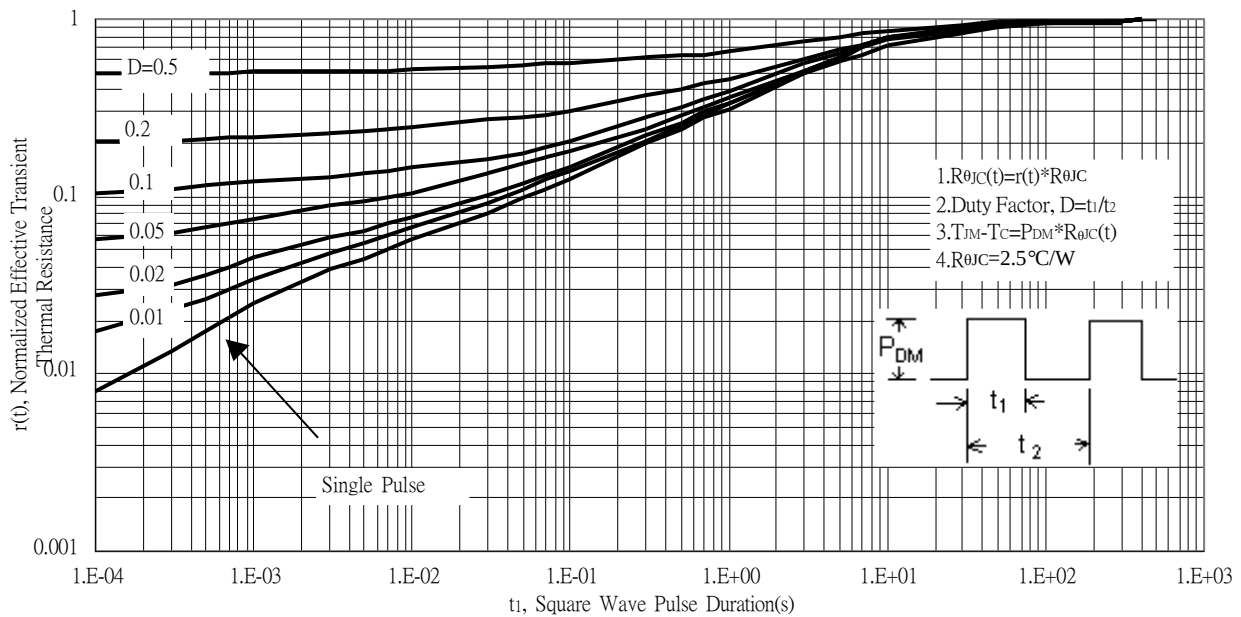
Typical Transfer Characteristics



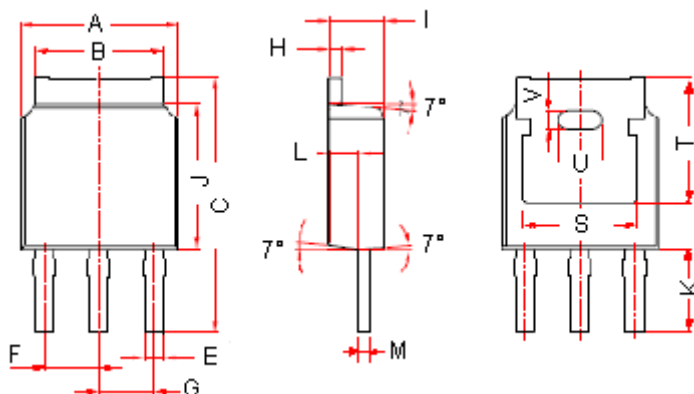
Single Pulse Power Rating, Junction to Case



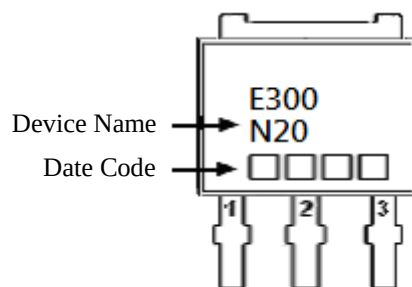
Transient Thermal Response Curves



TO-251S Dimension



Marking :



3-Lead TO-251S Plastic Package
 Package Code: I3S

Style : Pin 1. Gate 2. Drain 3. Source

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.2559	0.2638	6.50	6.70	J	0.2362	0.2441	6.00	6.20
B	0.2020	0.2126	5.13	5.46	K	0.1299	0.1457	3.30	3.70
C	0.4094	0.4331	10.40	11.00	L	0.0358	0.0437	0.91	1.11
E	0.0280	0.0319	0.71	0.81	M	0.0181	0.0220	0.46	0.56
F	0.0858	0.0941	2.18	2.39	S	0.1902	REF	4.83	REF
G	0.0858	0.0941	2.18	2.39	T	0.2106	REF	5.35	REF
H	0.0181	0.0220	0.46	0.56	U	0.0701	REF	1.78	REF
I	0.0902	0.0937	2.29	2.38	V	0.0299	REF	0.76	REF