

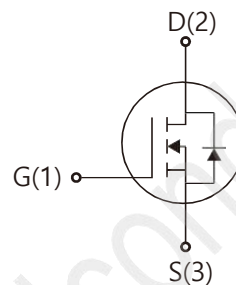
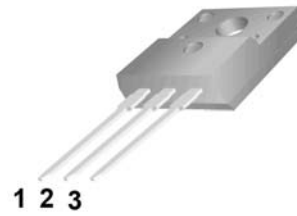


WGF65R099G

Features

- CRM(CQ) Super_Junction technology
- Much lower Ron*A performance for On-state efficiency
- Much lower FOM for fast switching efficiency

TO-220F



- 1.Gate (G)
2.Drain (D)
3.Source (S)

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	I_D	35 20	A
Pulsed drain current ($T_C = 25^\circ\text{C}$, t_p limited by T_{jmax})	$I_{D\ pulse}$	140	A
Avalanche energy, single pulse ($L=60\text{mH}$, $R_g=30\ \Omega$)	E_{AS}	480	mJ
Gate-Source voltage	V_{GS}	± 30	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	26	W
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction - case. Max	RthJC	-	3.38	4.73	°C/W	
Thermal resistance, junction - ambient. Max	RthJA	-	-	64	°C/W	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV _{DSS}	650	-	-	V	V _{GS} =0V, I _D =250uA
Gate threshold voltage	V _{GS(th)}	3.4	-	4.8	V	V _{DS} =V _{GS} , I _D =250uA
Zero gate voltage drain current	I _{DSS}	-	-	5	μA	V _{DS} =650V, V _{GS} =0V T _C =25°C T _C =150°C
		-	800	-		
Gate-source leakage current	I _{GSS}	-	-	±100	nA	V _{GS} =±30V, V _{DS} =0V
Drain-source on-state resistance	R _{DS(on)}	-	90	103	mΩ	V _{GS} =10V, I _D =17A, T _C =25°C T _C =150°C
		-	235	-		
Transconductance	g _{fs}	-	18.8	-	S	V _{DS} =20V, I _D =17A

Dynamic Characteristic

Input Capacitance	C _{iss}	-	2040	-	pF	V _{GS} =0V, V _{DS} =100V, f=1MHz
Output Capacitance	C _{oss}	-	130	-		
Reverse Transfer Capacitance	C _{rss}	-	37	-		
Gate Total Charge	Q _G	-	57	-	nC	V _{GS} =10V, V _{DS} =480V, I _D =17A, f=1MHz
Gate-Source charge	Q _{gs}	-	19.5	-		
Gate-Drain charge	Q _{gd}	-	30	-		
Turn-on delay time	t _{d(on)}	-	63.4	-	ns	T _j =25°C, V _{GS} =10V, I _D =17A, V _{DS} =400V, R _g =27Ω
Rise time	t _r	-	106	-		
Turn-off delay time	t _{d(off)}	-	132	-		
Fall time	t _f	-	30	-		
Gate resistance	R _G	-	0.9	-	Ω	V _{GS} =0V, V _{DS} =0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.7	0.9	1.2	V	$V_{GS}=0V, I_{SD}=17A$
Body Diode Reverse Recovery Time	t_{rr}	-	140	-	ns	$I_{sd}=17A$ $dI/dt=100A/\mu s, V_{ds}=400V$
Body Diode Reverse Recovery Charge	Q_{rr}	-	0.89	-	μC	

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25°C)

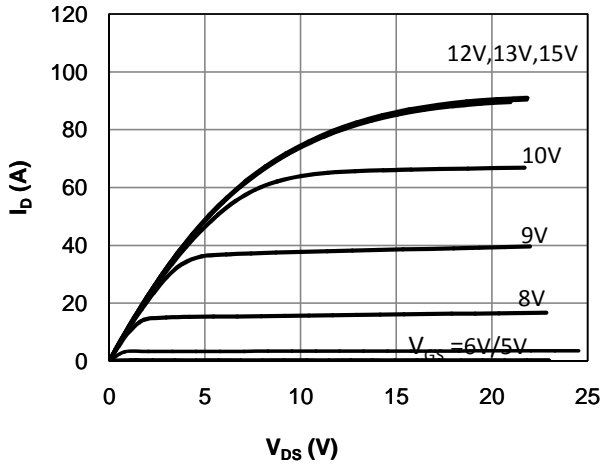


Fig 2. Output Characteristics (Tj=150°C)

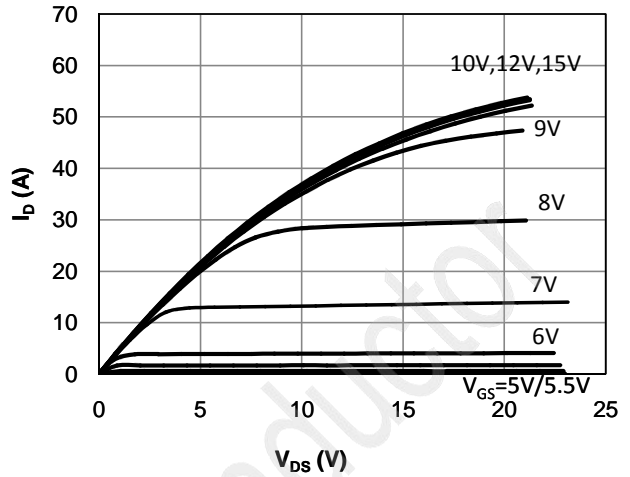


Fig 3: Transfer Characteristics

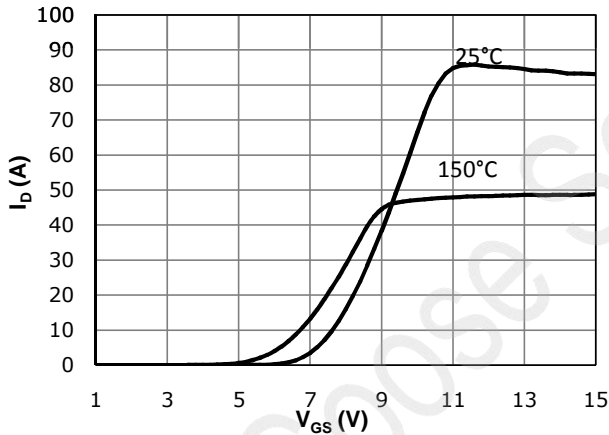


Fig 4: V_{TH} Vs Tj Temperature Characteristics

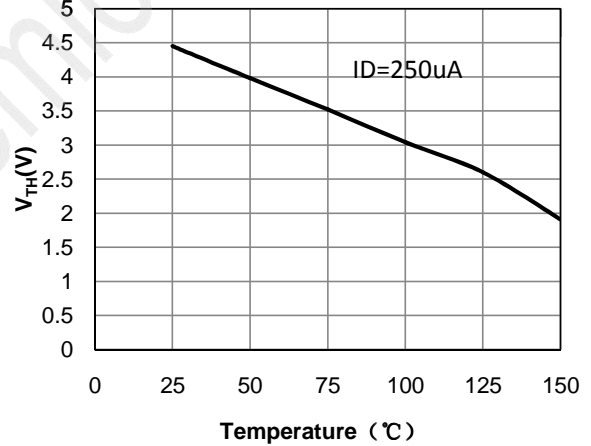


Fig 5: $R_{DS(on)}$ Vs I_{DS} Characteristics (Tc=25°C)

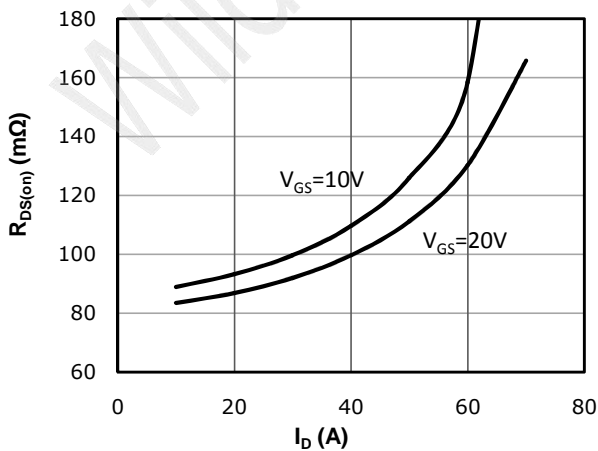


Fig 6: $R_{DS(on)}$ vs. Temperature

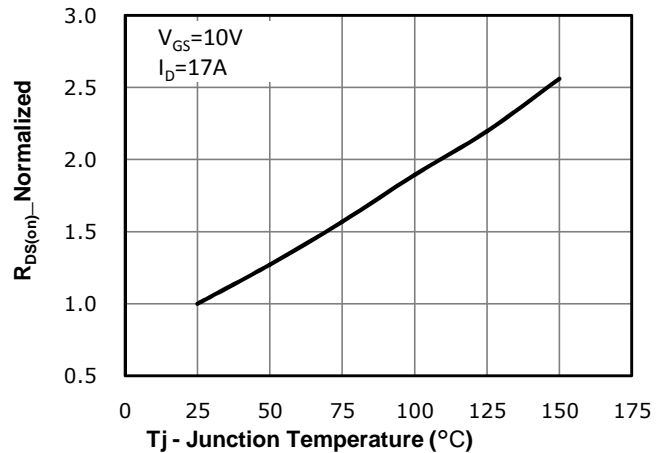


Fig 7: BVDSS vs. Temperature

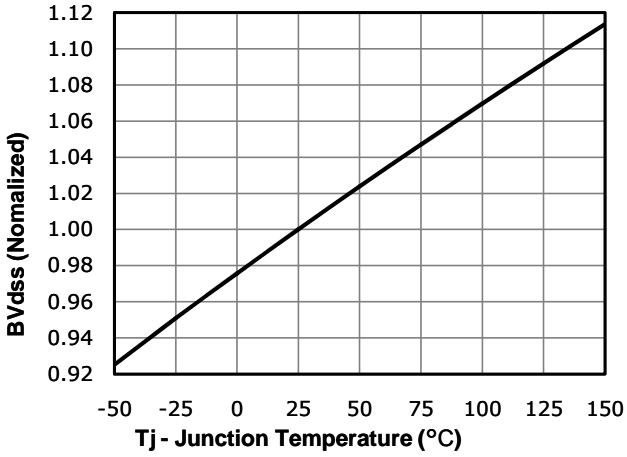


Fig 8: Rds(on) vs Gate Voltage

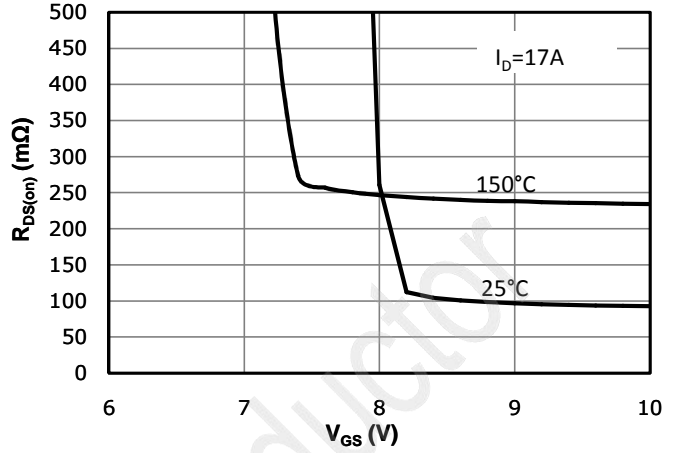


Fig 9: Body-diode Forward Characteristics

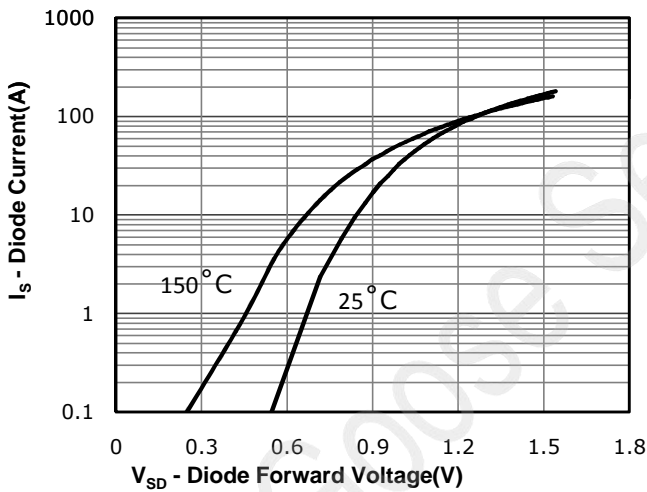


Fig 10: Gate Charge Characteristics

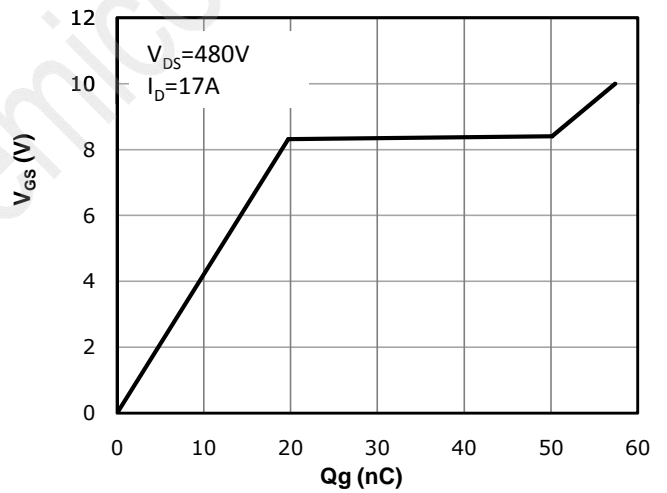


Fig 11: Capacitance Characteristics

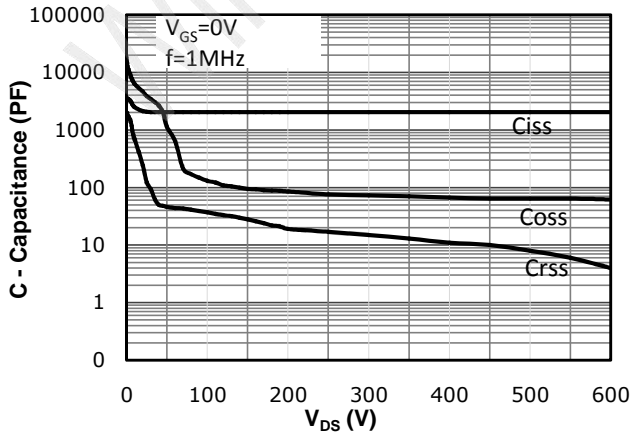


Fig 12: Safe Operating Area

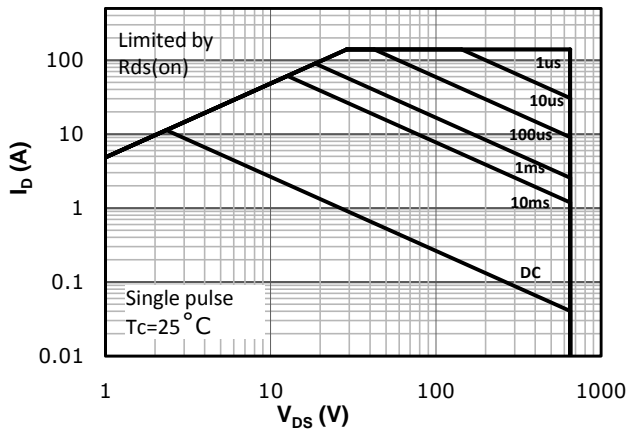
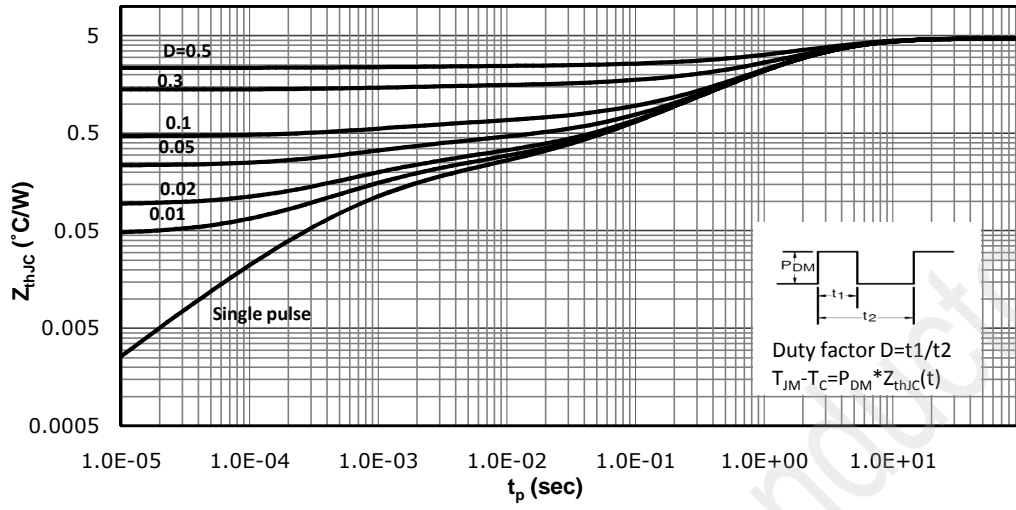
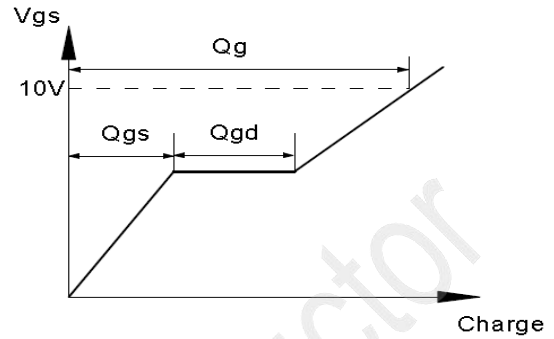
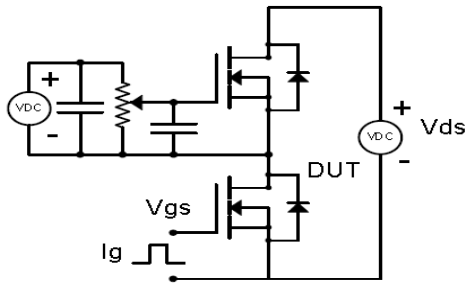


Fig 13: Max. Transient Thermal Impedance

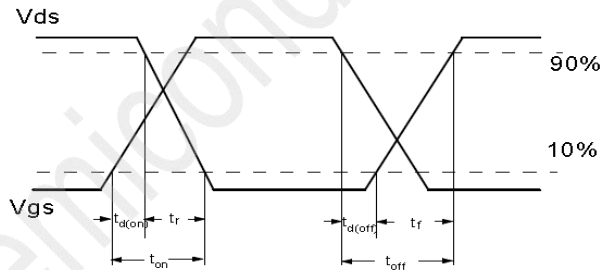
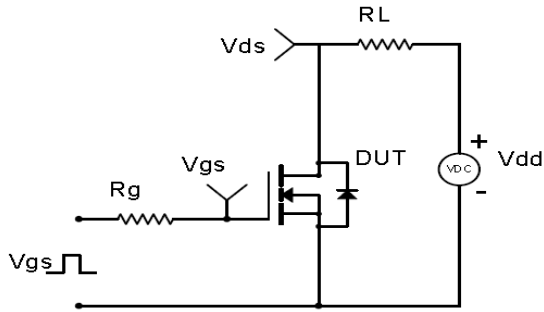


Test Circuit & Waveform

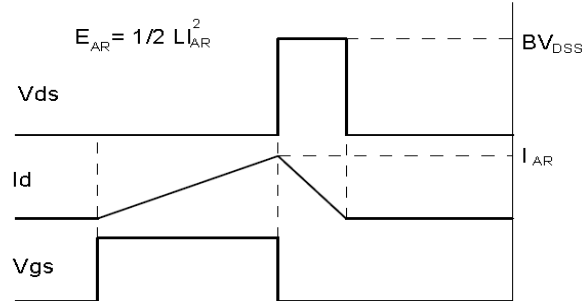
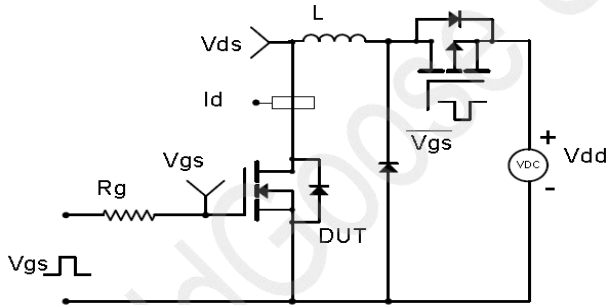
Gate Charge Test Circuit & Waveform



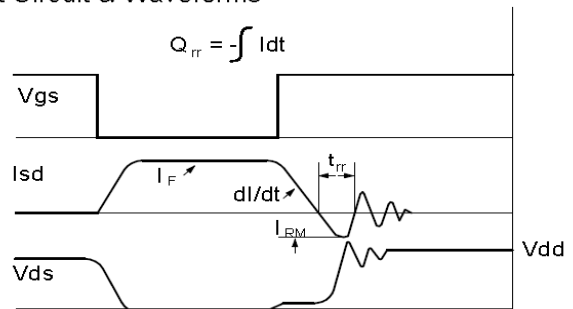
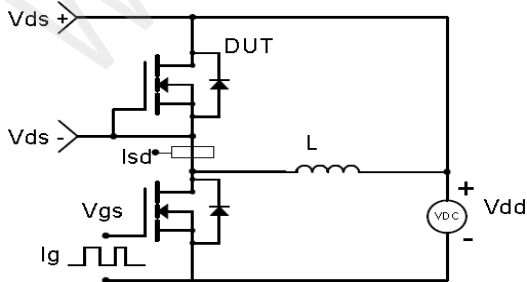
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



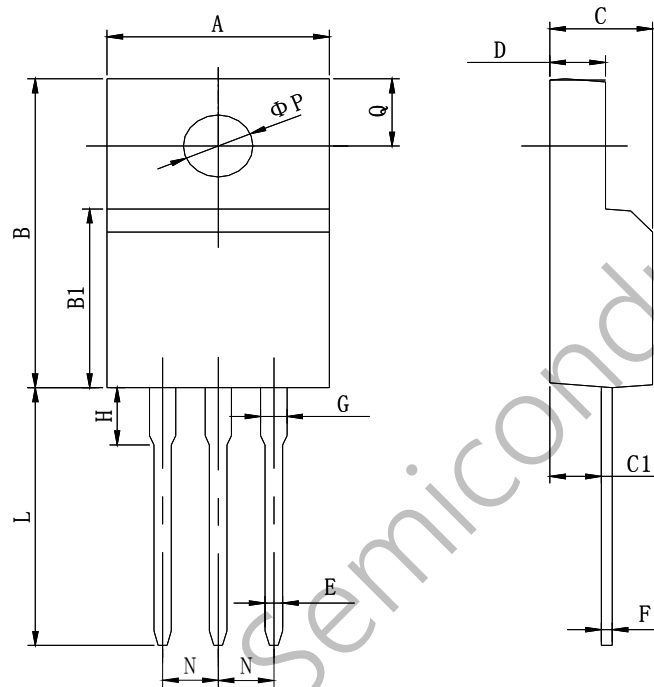
Diode Recovery Test Circuit & Waveforms



Package Dimension

TO-220F

Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	9.60	10.40	0.378	0.409
B	15.40	16.20	0.606	0.638
B1	8.90	9.50	0.350	0.374
C	4.30	4.90	0.169	0.193
C1	2.10	3.00	0.083	0.118
D	2.40	3.00	0.094	0.118
E	0.60	1.00	0.024	0.039
F	0.30	0.60	0.012	0.024
G	1.12	1.42	0.044	0.056
H	3.40	3.80	0.134	0.150
L*	12.00	14.00	0.472	0.551
N	2.34	2.74	0.092	0.108
Q	3.15	3.55	0.124	0.140
ΦP	2.90	3.30	0.114	0.130