40V N-channel Power SGT MOSFET

DESCRIPTION：

· Ultra-low ON-resistance, $R_{DS(ON)}$

·Low Gate Charge

·100% UIS Tested

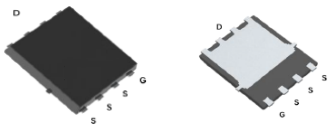
·100%ΔVds Tested

·Halogen-free

·RoHS-compliant

·AEC Q101 Qualified

V_{DSS}	40V
I_D	117A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	2.2mΩ



PDFN5×6-8L

TYPICAL APPLICATIONS：

·General Automtive Application

·Load Switch

·PWM Application

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	117 83	A
Pulsed Drain Current (1)		I_{DM}	Refer to Fig.4	A
Single Pulsed Avalanche Energy (2)		E_{AS}	238	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	71 35	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=12.6A, V_{DD}=0V during time in avalanche.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	45 2.1	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	40			V
Zero Gate Voltage Drain Current VDS = 32V, VGS = 0 V	I_{DSS}			1.0	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.9	2.7	3.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		2.2	2.9	mΩ
Gate Resistance f=1MHz	Rg		0.7		Ω
Input capacitance f=1MHz, VDS=20V, VGS=0 V	C_{iss}		2073	2798	pF
Output capacitance f=1MHz, VDS=20V, VGS=0 V	C_{oss}		1166	1574	pF
Reverse transfer capacitance f=1MHz, VDS=20V, VGS=0 V	C_{rss}		98	132	pF
Total Gate Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_G		32	44	nC
Gate to Source Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_{GS}		10	13	nC
Gate to Drain Charge VDS= 20V, ID= 20A,VGS= 0 to 10V	Q_{GD}		8		nC
Turn-on delay time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	td (ON)		13		ns
Rise time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	tr		25		ns
Turn-off delay time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	td (OFF)		22		ns
Fall time VDD=20 V, VGS= 10V, ID=20A, R_{GEN}=3Ω	tf		8		ns
Maximum Continuous Body Diode Forward Current	IS			117	A
Maximum Pulsed Body Diode Forward Current	ISM			468	A
Diode Forward Voltage VGS = 0V, I_S =20A	V_{SD}			1.2	V
Revers Recovery Time IF=20A, di/dt = 100A/us	Trr	27	38	51	ns
Revers Recovery Charge IF=20A, di/dt = 100A/us	Qrr		32		nC

Typical Performance Characteristics

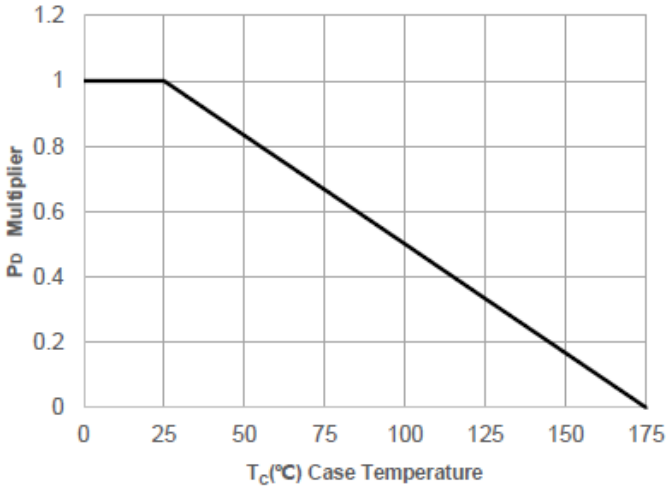


Figure 1. Power De-rating

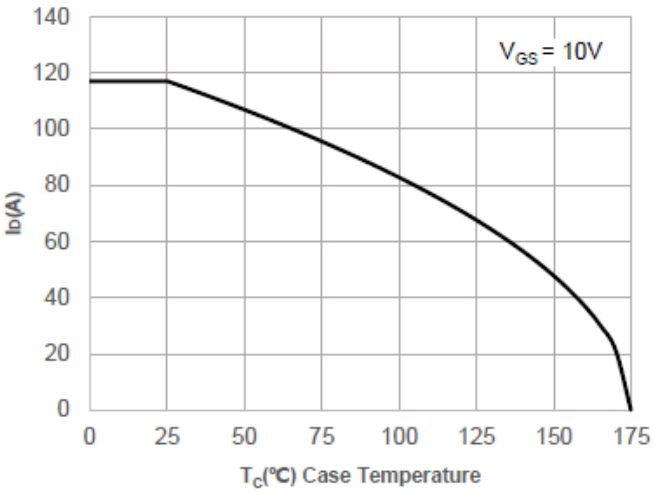


Figure 2. Current De-rating

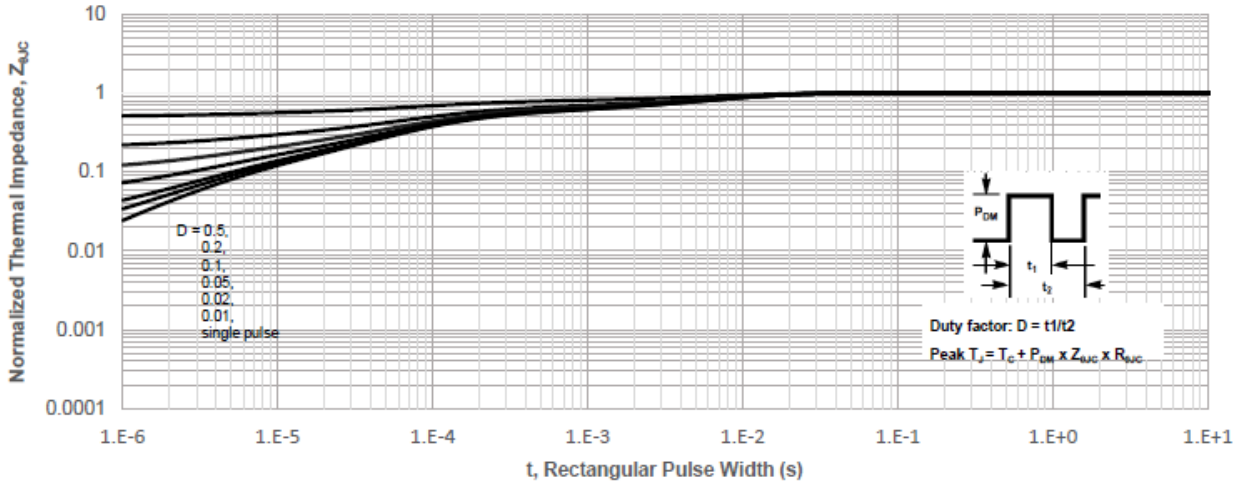


Figure 3. Normalized Maximum Transient Thermal Impedance

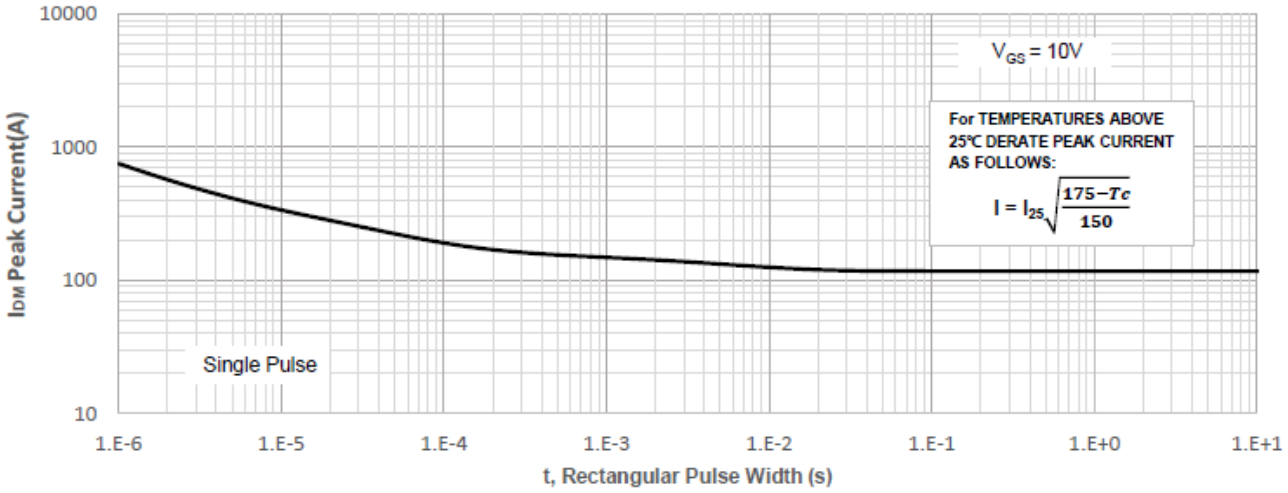


Figure4. Peak Current Capacity

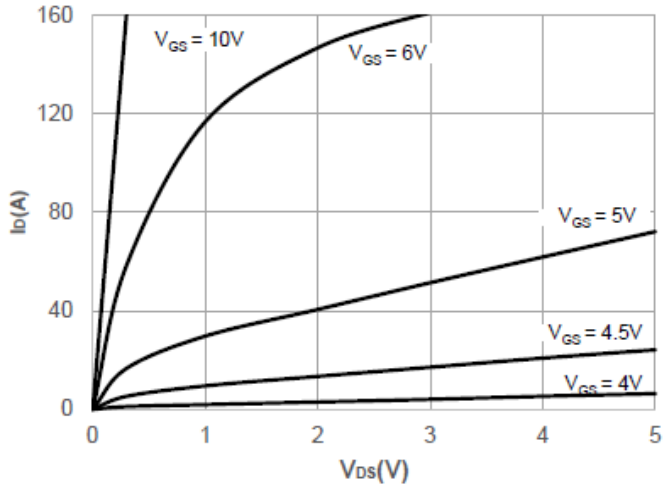


Figure 5. Output Characteristics

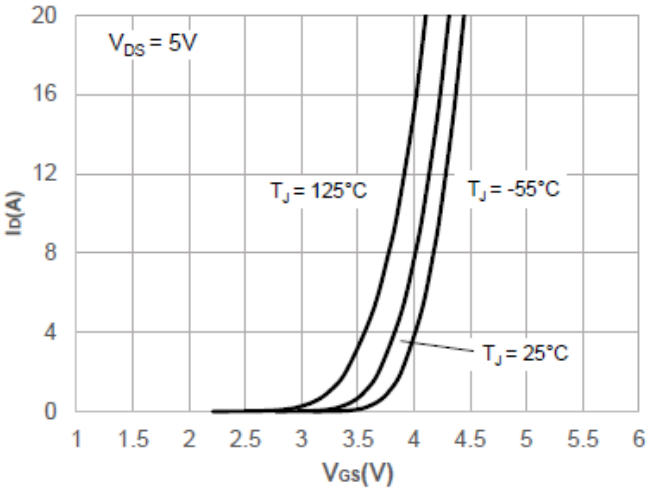


Figure 6. Typical Transfer Characteristics

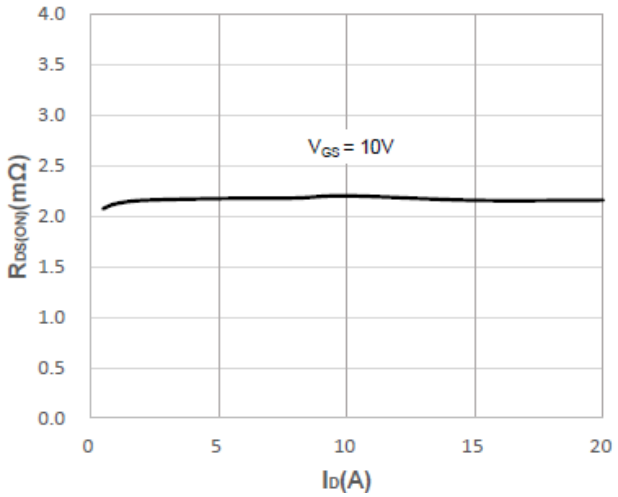


Figure 7. On-resistance vs. Drain Current

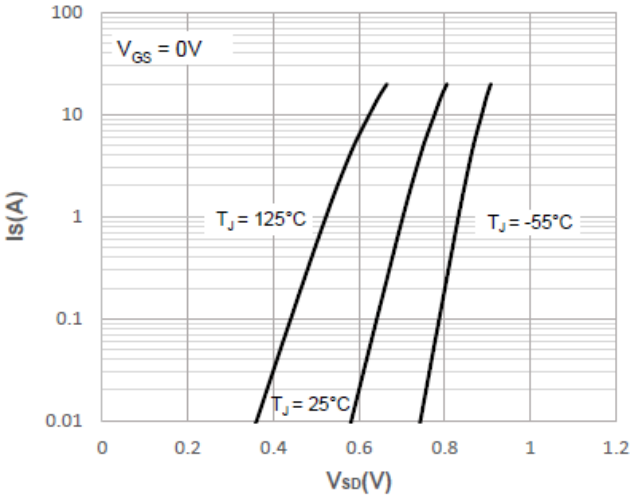


Figure8. Body Diode Characteristics

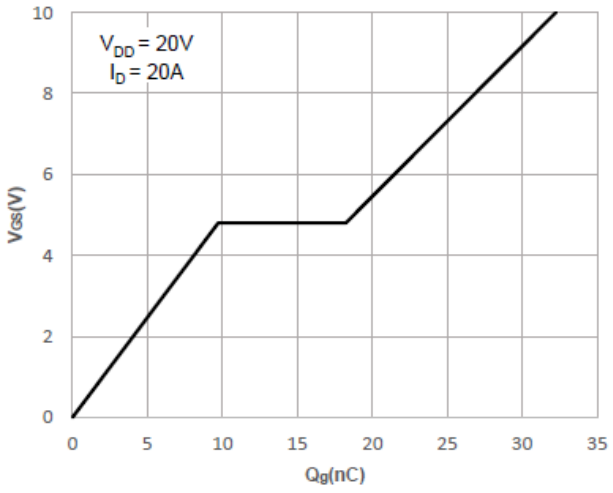


Figure 9. Gate Charge Characteristics

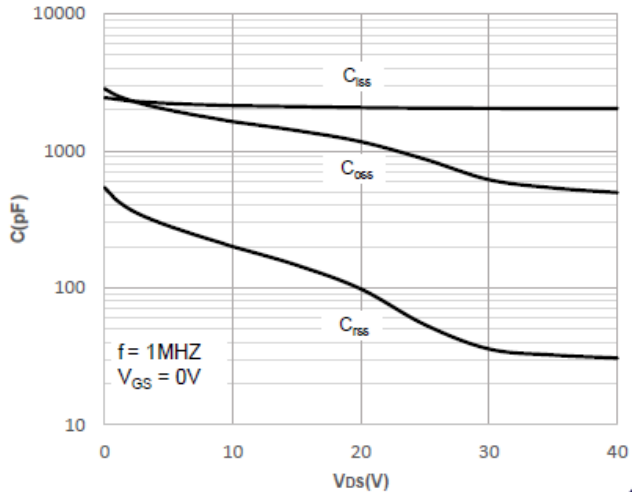


Figure 10. Capacitance Characteristics

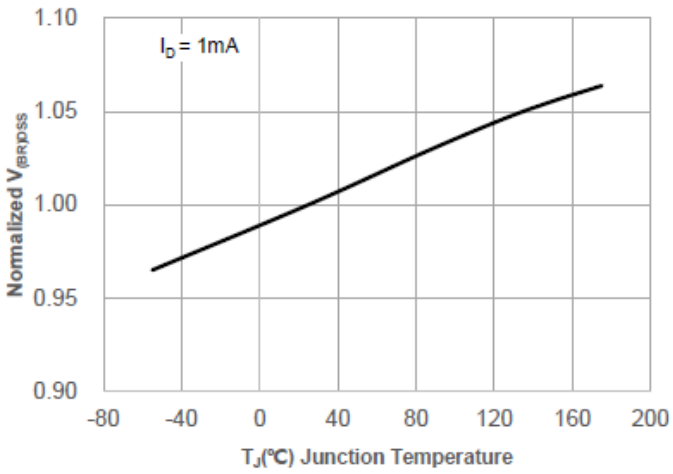


Figure 11. Normalized Breakdown voltage vs. Junction Temperature

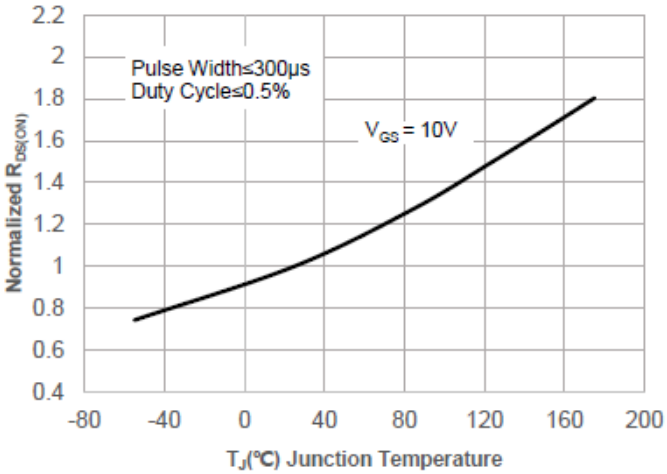


Figure 12. Normalized on Resistance vs. Junction Temperature

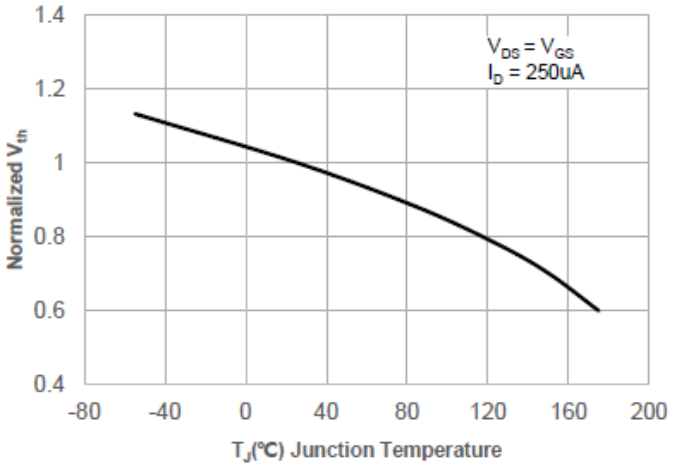


Figure 13. Normalized Threshold Voltage vs. Junction Temperature

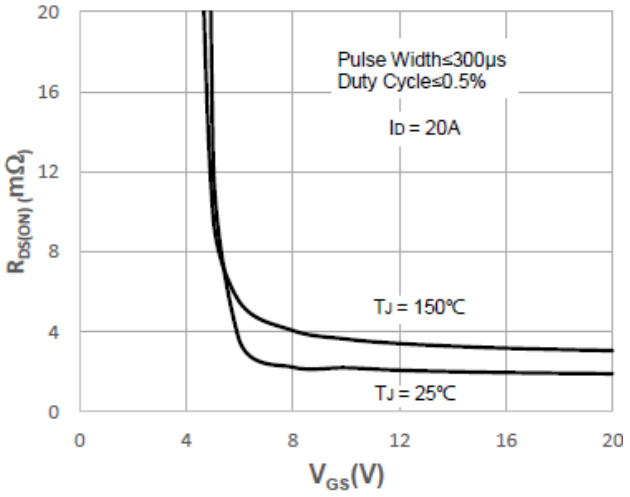


Figure14. $R_{DS(ON)}$ vs. V_{GS}

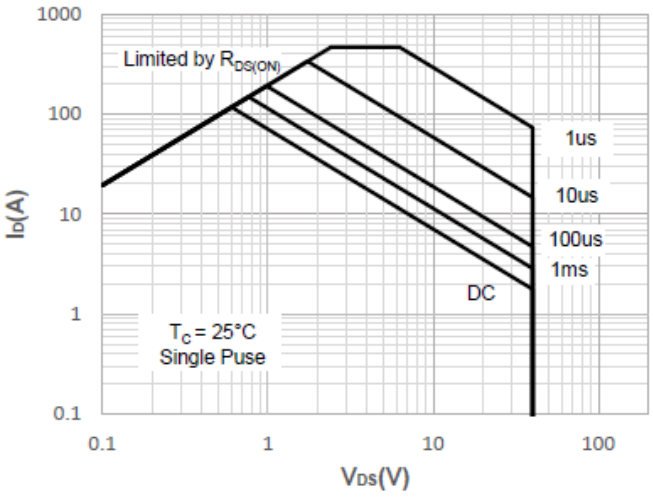
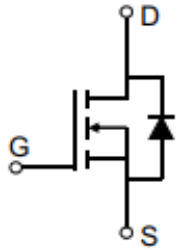
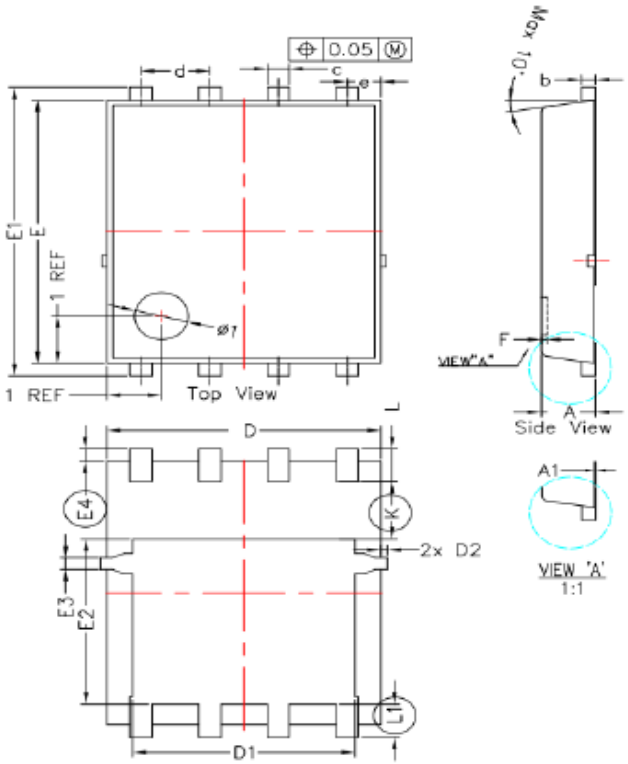


Figure 15. Maximum Safe Operating Area

·Circuit diagram



·Package outlines : Dimensions in (mm)



SYMBOLS	DIMENSION IN MM			DIMENSION IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
*A	0.900	1.000	1.150	0.035	0.039	0.045
A1	0.000	---	0.050	0.000	----	0.002
b	0.246	0.254	0.350	0.010	0.010	0.014
*C	0.310	0.410	0.510	0.012	0.016	0.020
d		1.27BSC			0.050BSC	
*D	4.950	5.050	5.150	0.195	0.199	0.203
D1	4.000	4.100	4.200	0.157	0.161	0.165
*D2		0.125REF			0.005REF	
e		0.62BSC			0.024BSC	
*E	5.500	5.600	5.700	0.217	0.220	0.224
*E1	6.050	6.150	6.250	0.238	0.242	0.246
E2	3.425	3.525	3.625	0.135	0.139	0.143
E3		0.250REF			0.010REF	
* E4		0.275REF			0.011REF	
F	-	-	0.100	-	-	0.004
*L	0.500	0.600	0.700	0.02	0.02	0.03
L1	0.600	0.700	0.800	0.02	0.03	0.03
K		1.225REF			0.05REF	

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