

**N-Channel 100-V (D-S) MOSFET**

**GENERAL DESCRIPTION**

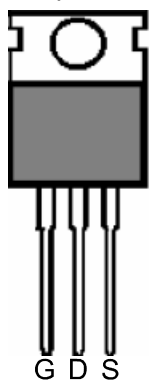
The ME110N10T and ME110N10F is the N-Channel logic enhancement mode power field effect transistors, using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on state resistance.

**FEATURES**

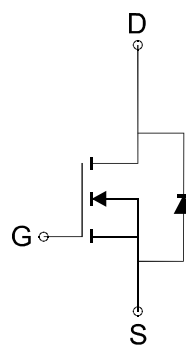
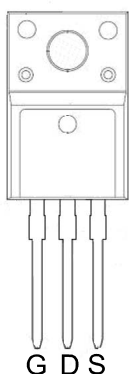
- $R_{DS(ON)} \leq 6.2m\Omega @ V_{GS}=10V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability

**PIN CONFIGURATION**

(TO-220AB)  
Top View



(TO-220F)  
Top View



N-Channel MOSFET

**Ordering Information** : ME110N10T(TO-220AB)  
ME110N10F(TO-220F)

**Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)**

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		$V_{DSS}$	100	V
Gate-Source Voltage		$V_{GSS}$	±25	V
Continuous Drain Current*	$T_C=25^\circ C$	$I_D$	140	A
	$T_C=100^\circ C$		105	
Pulsed Drain Current		$I_{DM}$	550	A
Maximum Power Dissipation	$T_C=25^\circ C$	$P_D$	217	W
	$T_C=100^\circ C$		108	
Operating Junction Temperature		$T_J$	-55 to 175	°C
Thermal Resistance-Junction to Case**		$R_{\theta JC}$	0.69	°C/W

\* Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 140A.

\*\* The device mounted on 1in<sup>2</sup> FR4 board with 2 oz copper.

**N-Channel 100-V (D-S) MOSFET**
**Electrical Characteristics (TA=25°C Unless Otherwise Specified)**

Symbol	Parameter	Limit	Min	Typ	Max	Unit
<b>STATIC</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250 μA	100			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μA	2	3	4	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±25V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA
R <sub>DS(ON)</sub> (TO-220AB)	Drain-Source On-Resistance <sup>a</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =70A		6.2	7.5	mΩ
R <sub>DS(ON)</sub> (TO-220F)	Drain-Source On-Resistance <sup>a</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =70A		7.0	8.0	mΩ
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =70A, V <sub>GS</sub> =0V		0.8	1.0	V
<b>DYNAMIC</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =80V, V <sub>GS</sub> =10V, I <sub>D</sub> =70A		130		nC
Q <sub>gs</sub>	Gate-Source Charge			25		
Q <sub>gd</sub>	Gate-Drain Charge			32		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz		6140		pF
C <sub>oss</sub>	Output Capacitance			943		
C <sub>rss</sub>	Reverse Transfer Capacitance			490		
R <sub>g</sub>	Gate-Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz		1.7		Ω
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =50V, R <sub>G</sub> =6Ω, V <sub>GS</sub> =10V, I <sub>DS</sub> =70A		23		ns
t <sub>r</sub>	Turn-On Rise Time			39		
t <sub>d(off)</sub>	Turn-Off Delay Time			86		
t <sub>f</sub>	Turn-Off Fall Time			46		

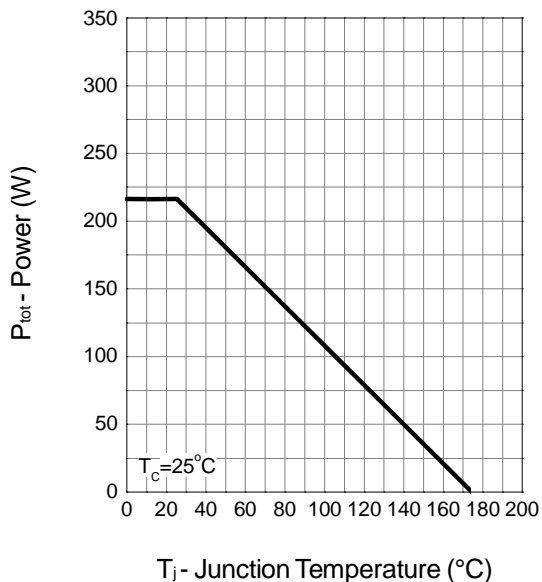
Notes: a. Pulse test: pulse width ≤ 300us, duty cycle ≤ 2%, Guaranteed by design, not subject to production testing.

b. Matsuki reserves the right to improve product design, functions and reliability without notice.

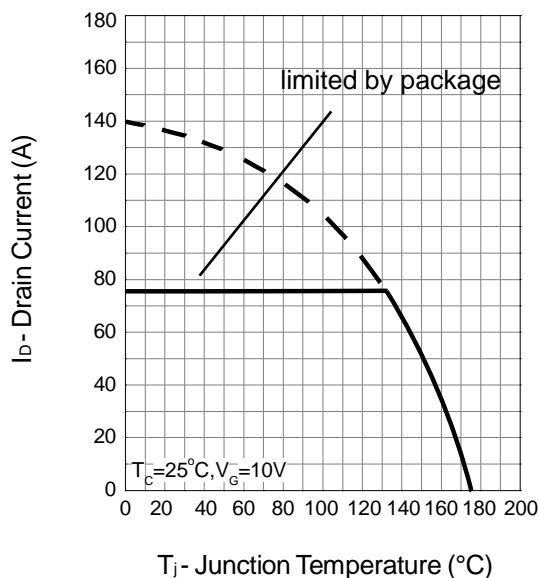
**N-Channel 100-V (D-S) MOSFET**

Typical Characteristics (T<sub>J</sub> = 25°C Noted)

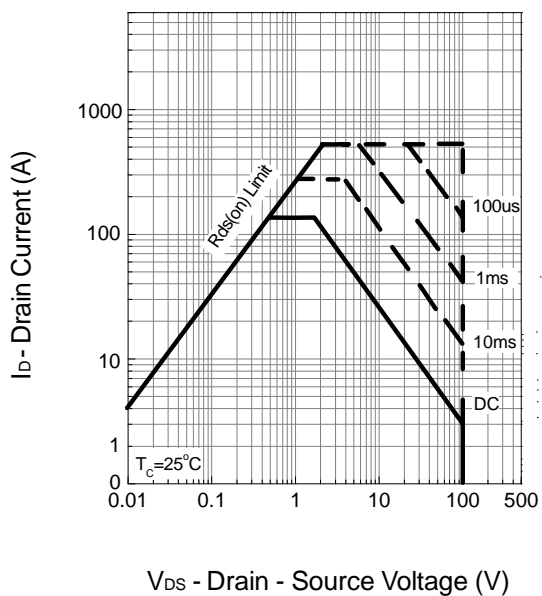
**Power Dissipation**



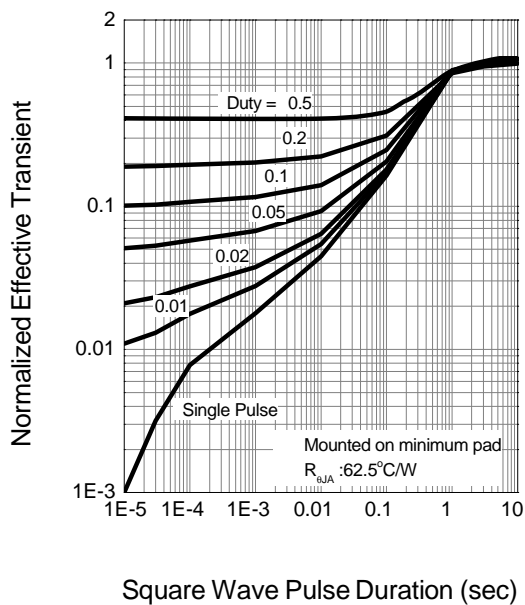
**Drain Current**



**Safe Operation Area**



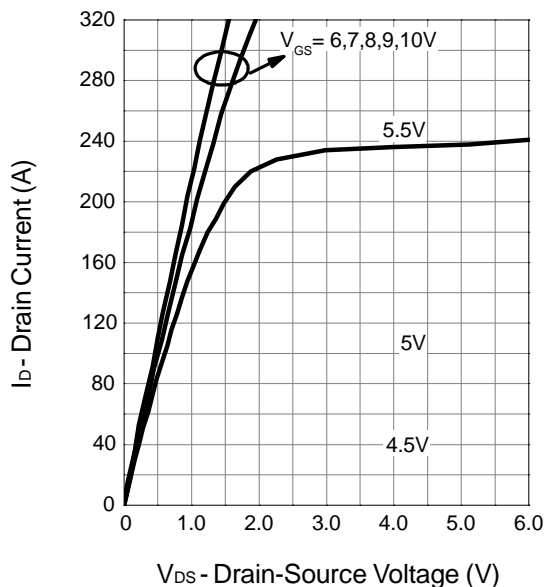
**Thermal Transient Impedance**



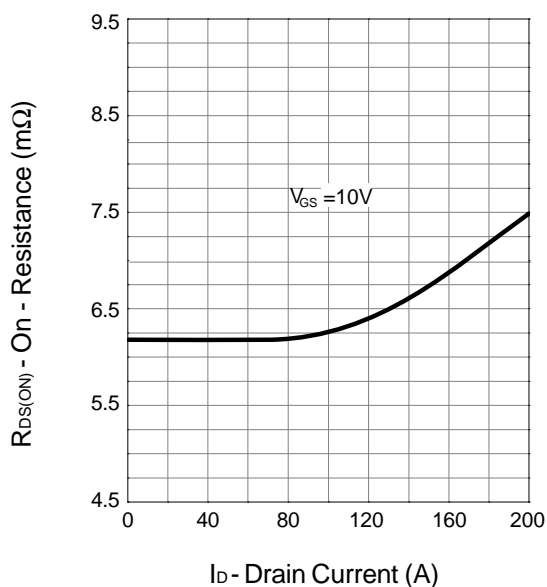
N-Channel 100-V (D-S) MOSFET

Typical Characteristics (T<sub>J</sub> = 25°C Noted)

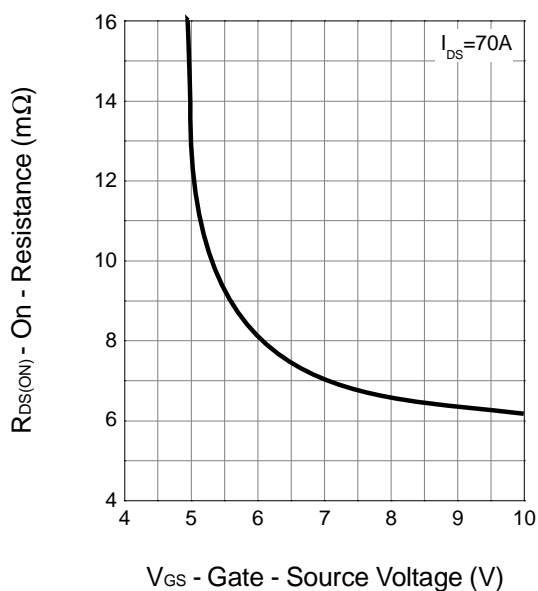
**Output Characteristics**



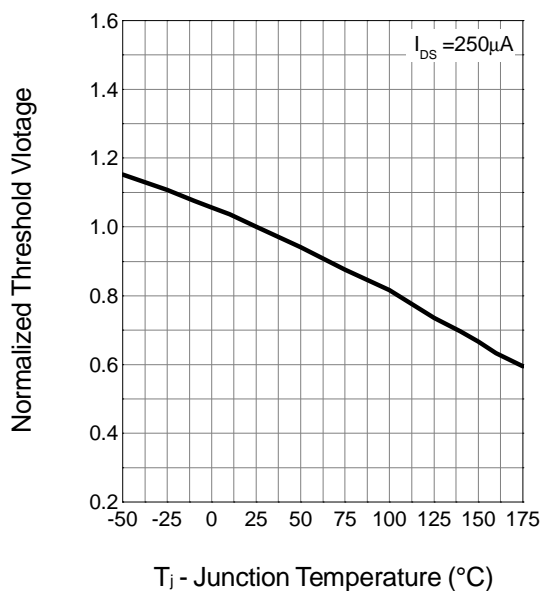
**Drain-Source On Resistance**



**Drain-Source On Resistance**



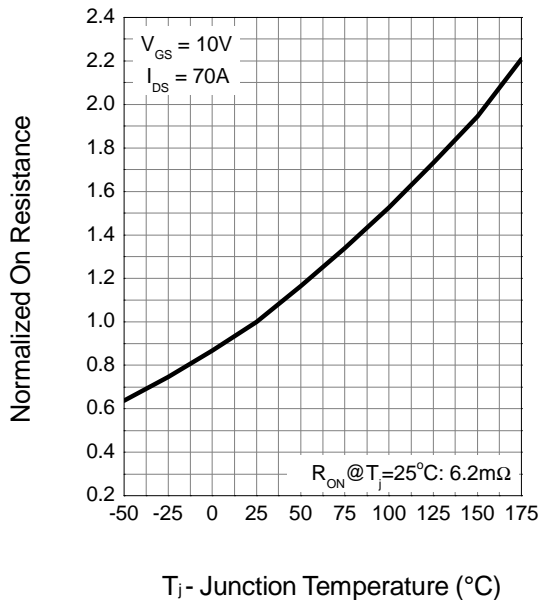
**Gate Threshold Voltage**



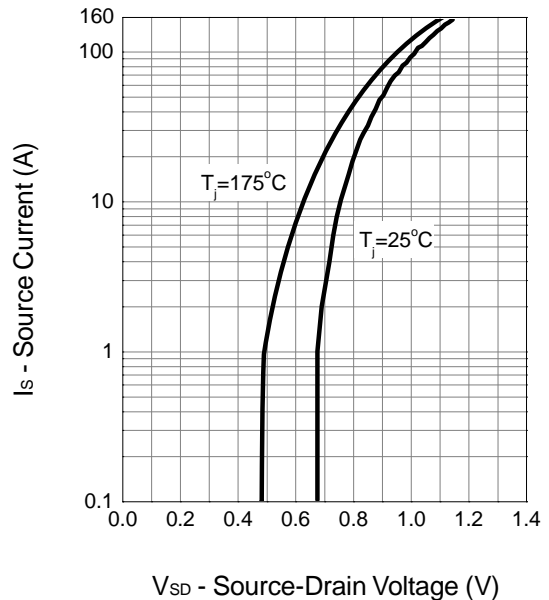
**N-Channel 100-V (D-S) MOSFET**

Typical Characteristics (T<sub>J</sub> =25°C Noted)

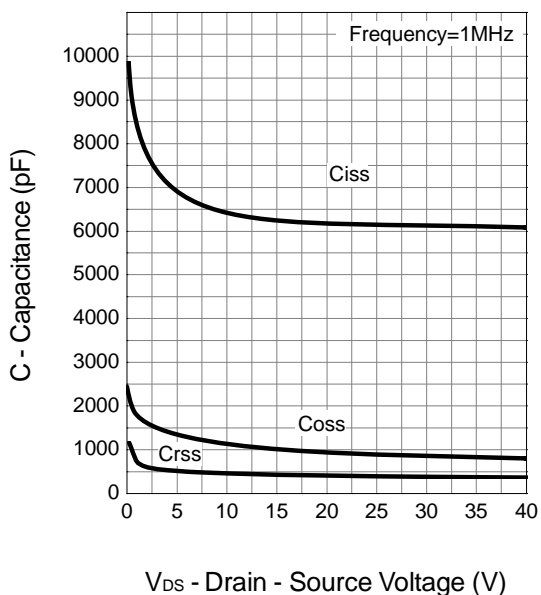
**Drain-Source On Resistance**



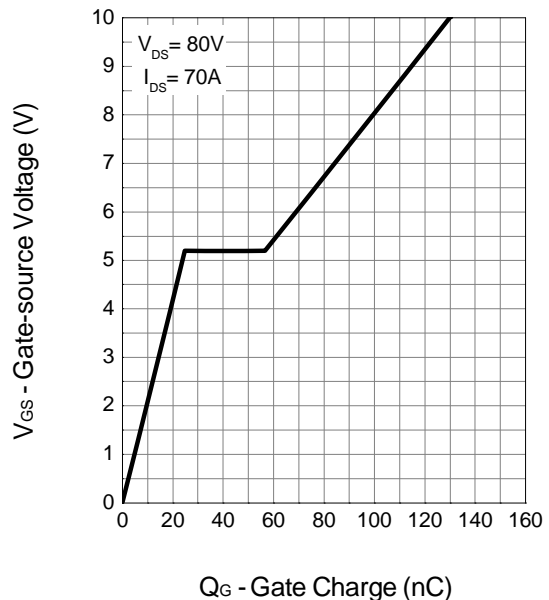
**Source-Drain Diode Forward**



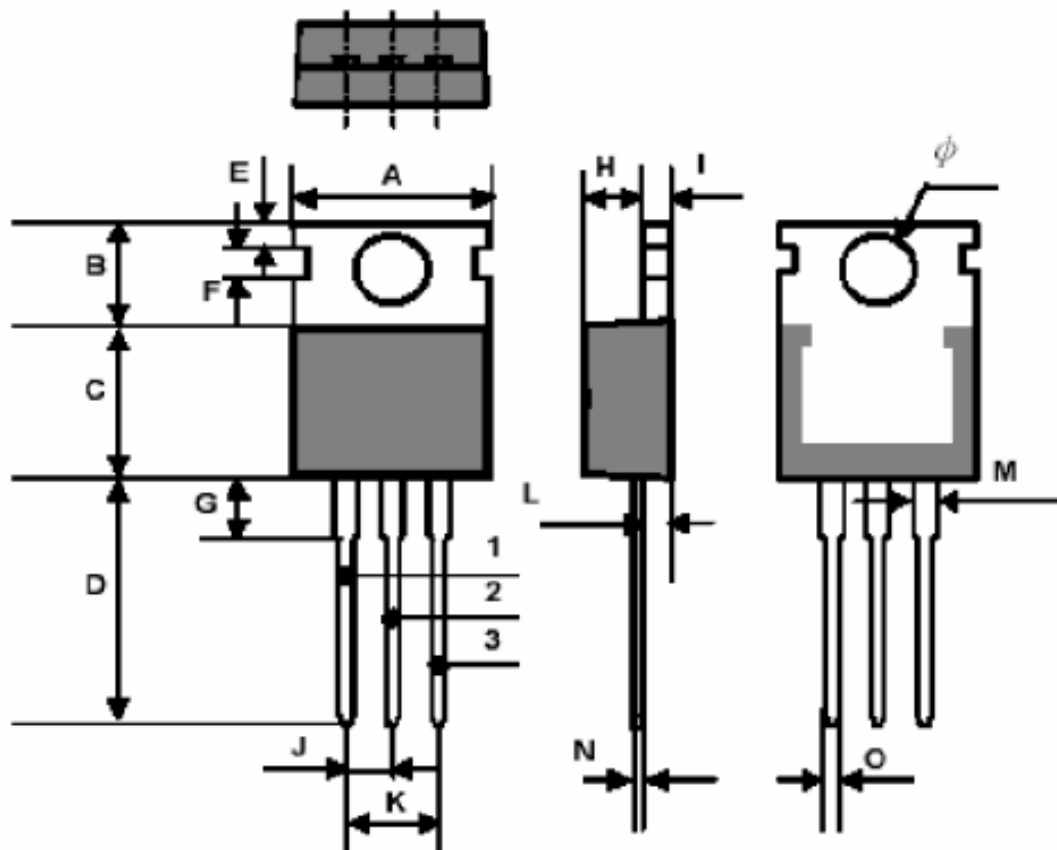
**Capacitance**



**Gate Charge**

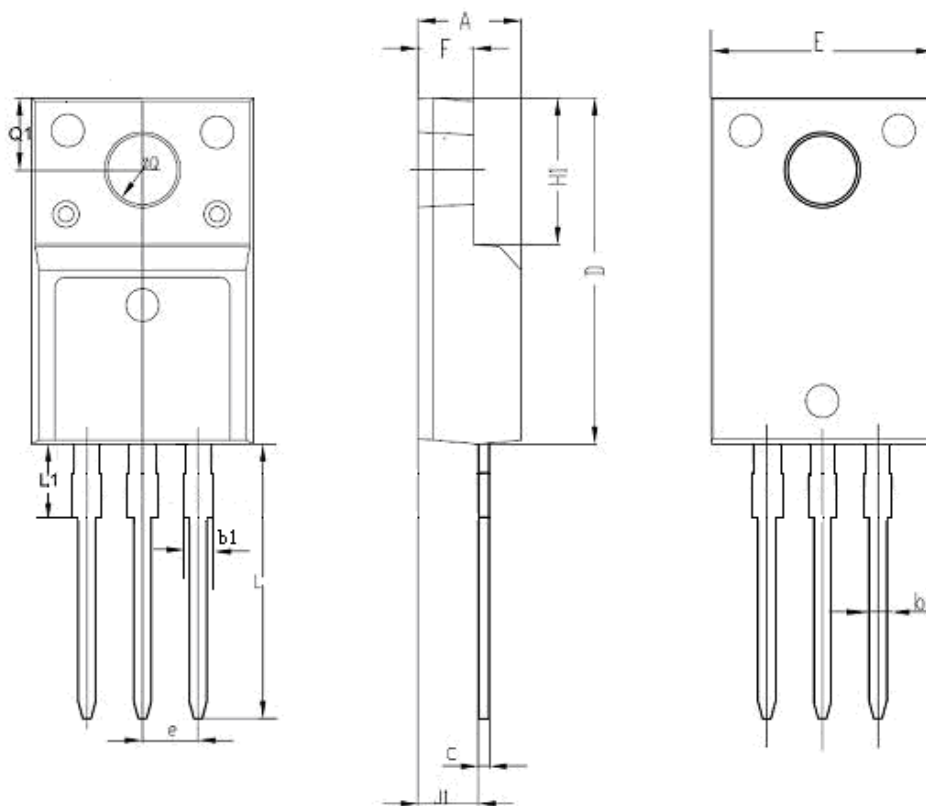


**TO-220AB Package Outline**



Symbol	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	9.7	10.1	0.382	0.398
B	6.3	6.7	0.248	0.264
C	9	9.47	0.354	0.373
D	12.8	13.3	0.504	0.524
E	1.2	1.4	0.047	0.055
F	1.7TYP		0.067TYP	
G	2.65TYP		0.104TYP	
H	3	3.4	0.118	0.134
I	1.25	1.4	0.049	0.055
J	2.4	2.7	0.094	0.106
K	5	5.15	0.197	0.203
L	2.2	2.6	0.087	0.102
M	1.25	1.45	0.049	0.057
N	0.45	0.6	0.018	0.024
O	0.7	0.9	0.027	0.035
φ	3.6		0.142	

**TO-220F Package Outline**



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.178	0.194	4.53	4.93	
b	0.028	0.036	0.71	0.91	
C	0.018	0.024	0.45	0.60	
D	0.617	0.633	15.67	16.07	
E	0.392	0.408	9.96	10.36	
e	0.100 TYP.		2.54 TYP.		
H1	0.256	0.272	6.50	6.90	
J1	0.101	0.117	2.56	2.96	
L	0.503	0.519	12.78	13.18	
$\phi Q$	0.117	0.133	2.98	3.38	
b1	0.045	0.055	1.15	1.39	
L1	0.114	0.130	2.9	3.3	
Q1	0.122	0.138	3.10	3.50	
F	0.092	0.108	2.34	2.74	

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