

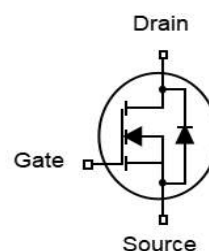
Features

- N-Channel
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature
- Pb-free lead plating
- 100% EAS Tested

V_{DS}	30	V
$R_{DS(on),TYP@ V_{GS}=10V}$	4.8	m Ω
$R_{DS(on),TYP@ V_{GS}=4.5V}$	7.0	m Ω
I_D	50	A

DFN3x3


Part ID	Package Type	Marking	Packing
ZTG050N03Q	DFN3x3	ZTG050N03Q	6500pcs/Reel



Absolute Maximum Ratings $T_A=25^{\circ}\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C=25^{\circ}\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 20	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	30	V	
T_J	Maximum Junction Temperature	150	$^{\circ}\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$	
I_{DM}	Drain Current-Continuous@ Current-Pulsed (Note 1)	$T_C=25^{\circ}\text{C}$ 200	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	$T_C=25^{\circ}\text{C}$	50	A
		$T_C=100^{\circ}\text{C}$	35	A
P_D	Maximum Power Dissipation	45	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case (Note 2)	4	$^{\circ}\text{C}/\text{W}$	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 5)	150	mJ	

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J=25°C (unless otherwise stated)						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.6	2.2	V
RDS(on)	Drain-Source On-State Resistance ^(Note 3)	V _{GS} =10V, I _D =20A	--	4.8	6.0	mΩ
RDS(on)	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =15A	--	7.0	9.0	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) ^(Note 4)						
Ciss	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	823	--	pF
Coss	Output Capacitance		--	345	--	pF
Crss	Reverse Transfer Capacitance		--	15.3	--	pF
Qg	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	15	--	nC
Qgs	Gate-Source Charge		--	2.9	--	nC
Qgd	Gate-Drain Charge		--	2.1	--	nC
Switching Characteristics ^(Note 4)						
Td(on)	Turn-on Delay Time	V _{DD} =15V, I _D =20A, R _G =1.6Ω, V _{GS} =10V	--	6.5	--	ns
Tr	Turn-on Rise Time		--	2.5	--	ns
Td(off)	Turn-Off Delay Time		--	17	--	ns
Tf	Turn-Off Fall Time		--	2.5	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
IS	Diode Forward Current ^(Note 2)		--	--	50	A
VSD	Forward on voltage ^(Note 3)	I _S =20A, V _{GS} =0V	--	--	1.2	V
Trr	Reverse Recovery Time	T _J =25°C, I _S = I _F di/dt=100A/μs	--	11	--	ns
Qrr	Reverse Recovery Charge		--	19	--	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_J=25°C, V_{DD}=20V, V_G=10V, L=0.5mH, R_G=25Ω

Typical Electrical and Thermal Characteristics

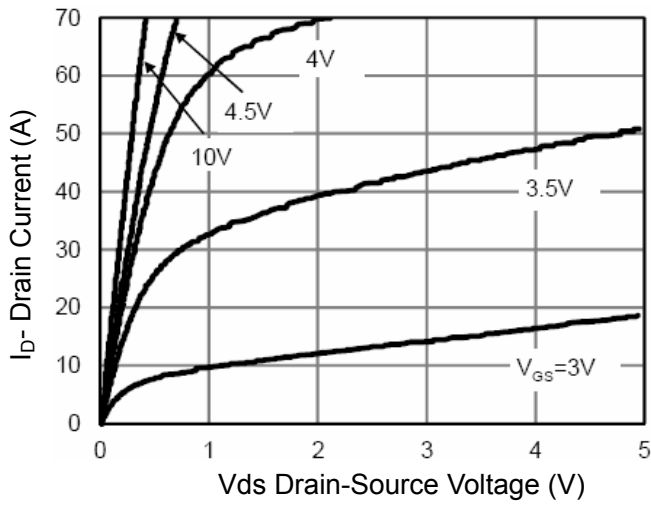


Figure 1 Output Characteristics

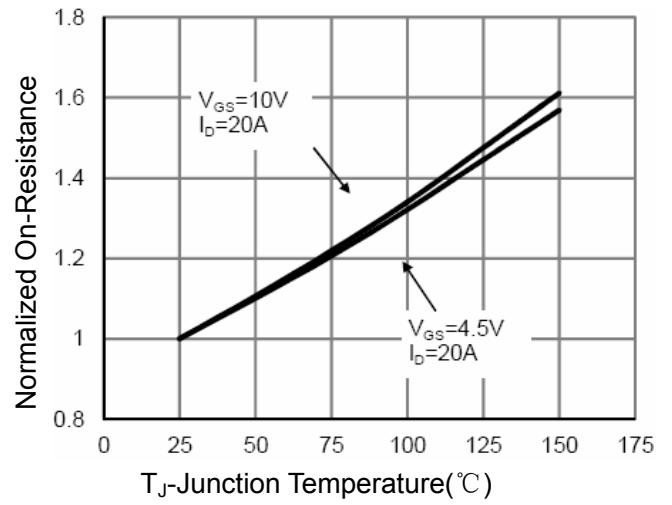


Figure 4 Rdson-Junction Temperature

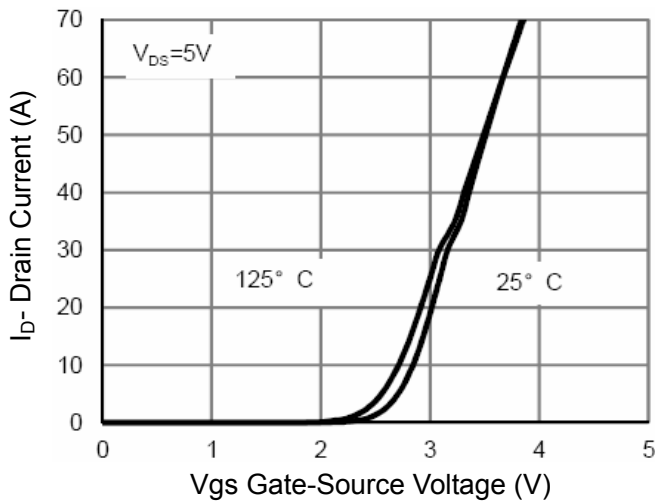


Figure 2 Transfer Characteristics

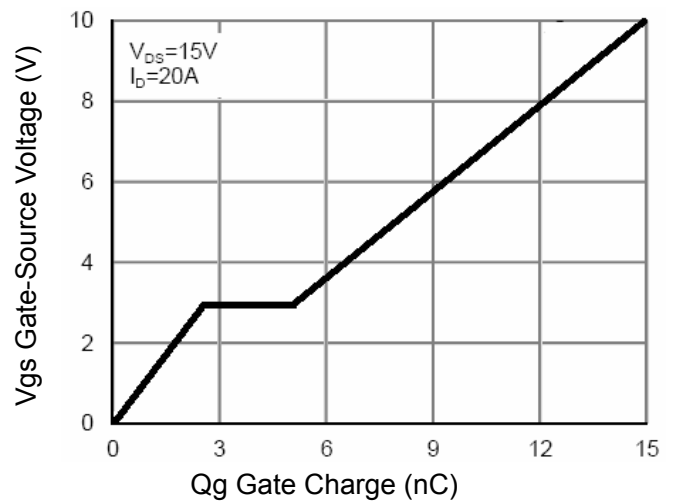


Figure 5 Gate Charge

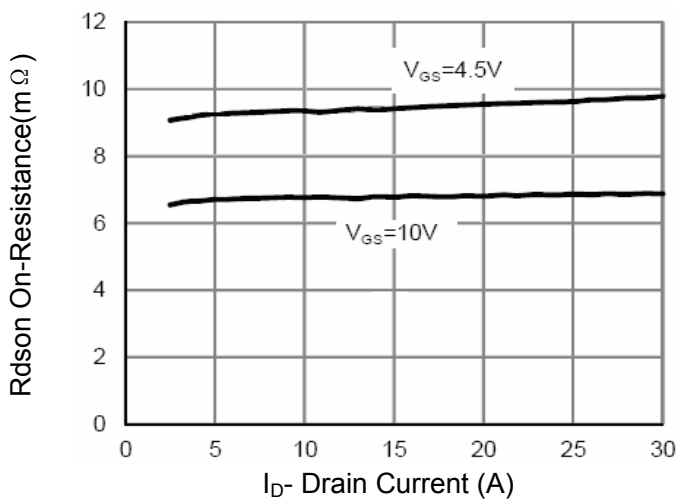


Figure 3 Rdson- Drain Current

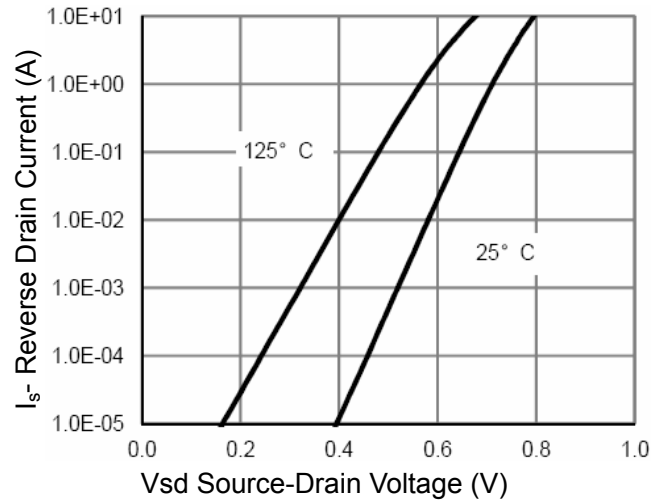


Figure 6 Source- Drain Diode Forward

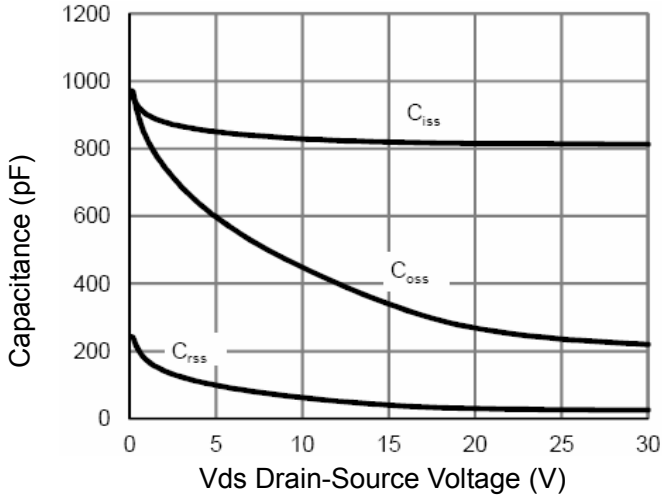


Figure 7 Capacitance vs Vds

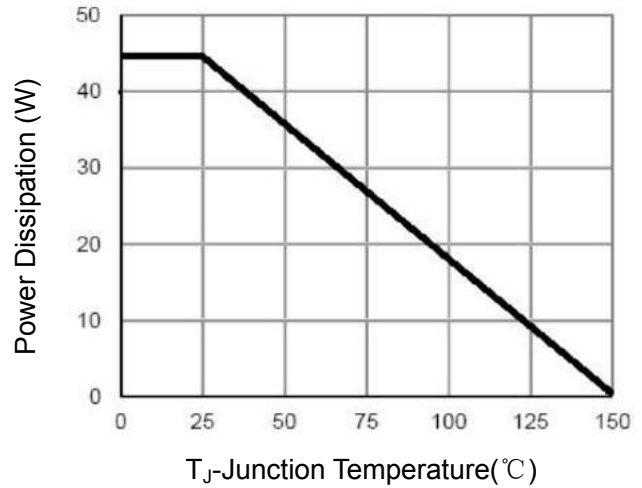


Figure 9 Power De-rating

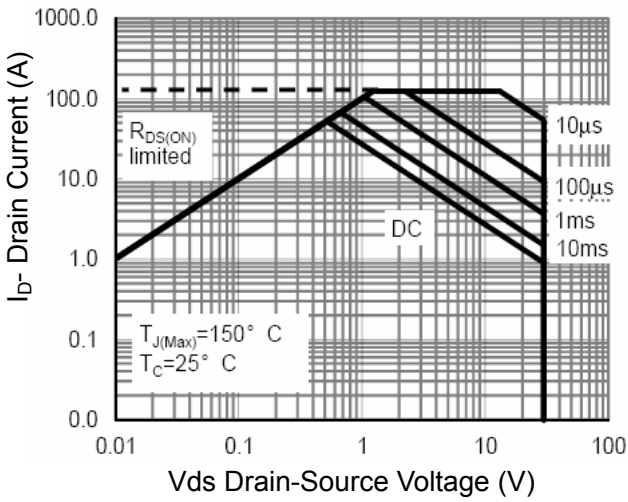


Figure 8 Safe Operation Area

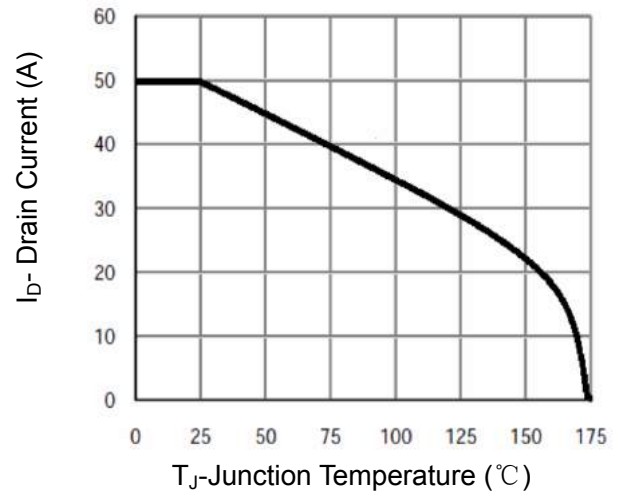


Figure 10 Current De-rating

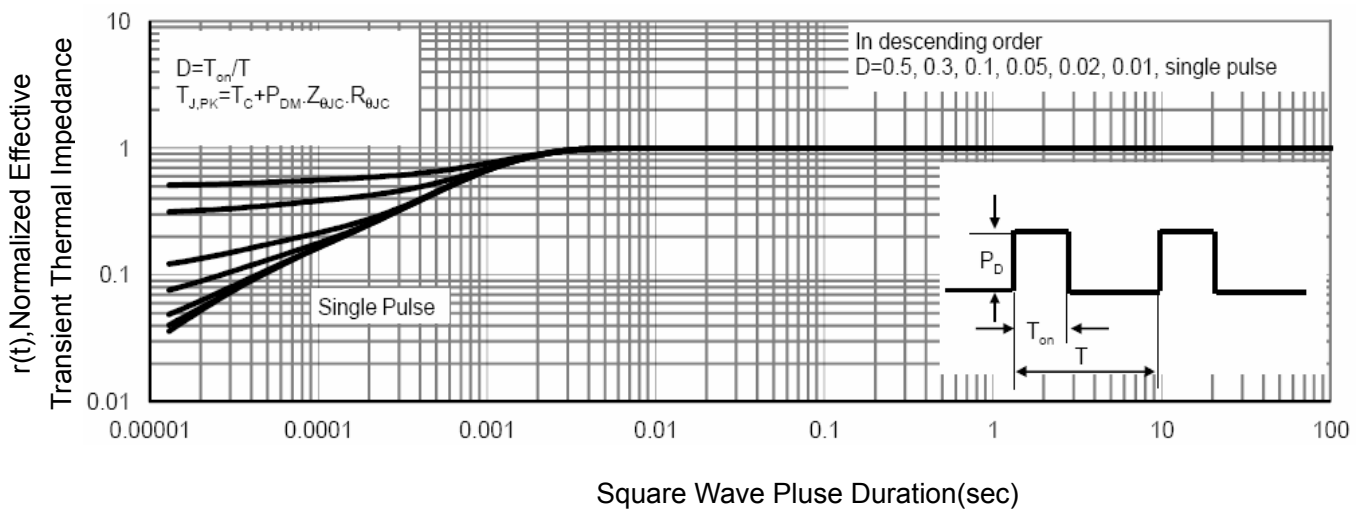
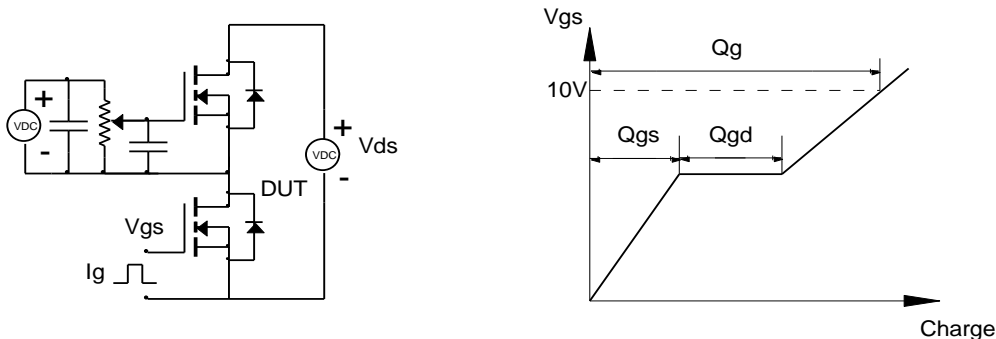


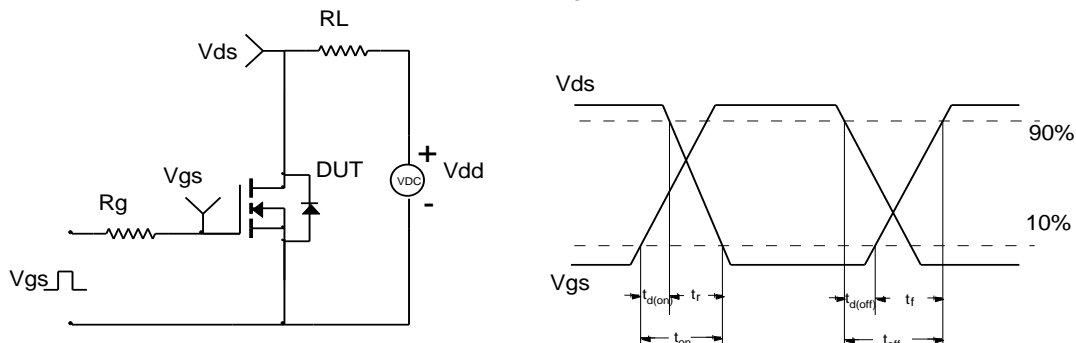
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit and Waveform

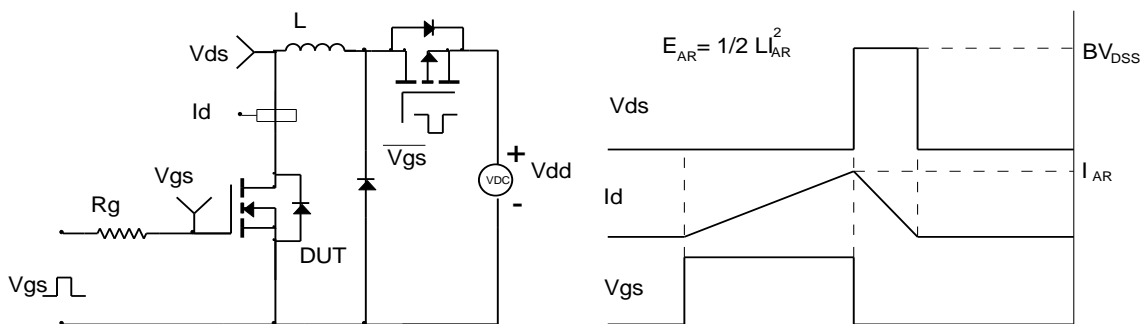
Gate Charge Test Circuit & Waveform



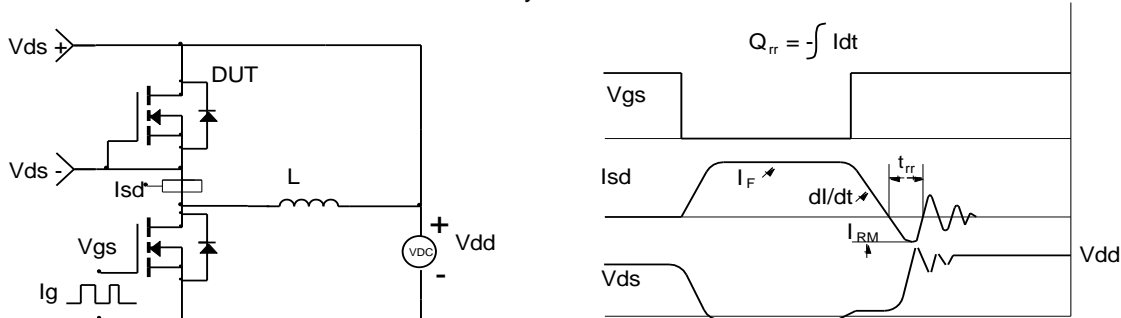
Resistive Switching Test Circuit & Waveforms



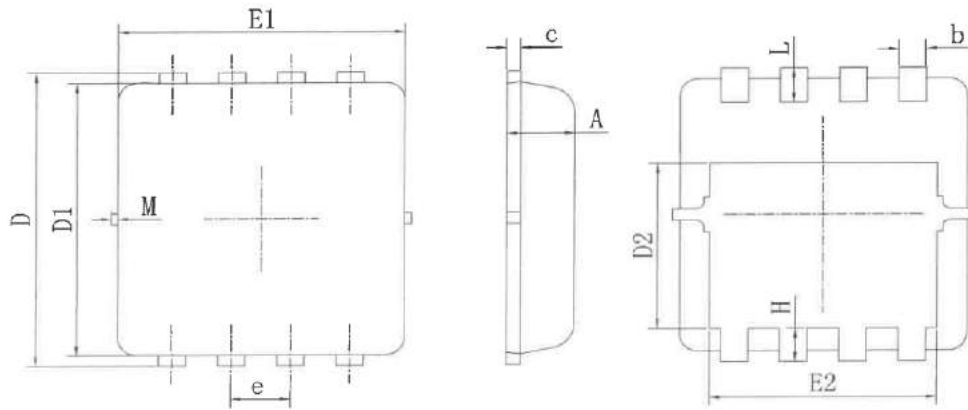
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



DFN3x3-8L Package Information



SYMBOL	DIMENSIONAL REQMTS		
	MIN	MON	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
E1	3.10	3.20	3.30
E2	2.44	2.54	2.64
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
M	\	\	0.10
*Not specified			

Customer Service

Sales and Service:

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