



Description

The FQD10N20TM can be used in various power switching circuit for system miniaturization and higher efficiency. The package form is TO-252-2L, which accords with the RoHS standard.

General Features

$V_{DS} = 200V$ $I_D = 9A$

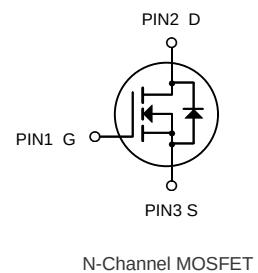
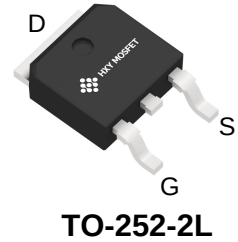
$R_{DS(ON)} < 270m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Ordering Information

Product ID	Pack	Brand	Qty(PCS)
FQD10N20TM	TO-252-2L	HXY MOSFET	2500

Absolute Maximum Ratings ($T_c=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_c=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	9	A
$I_D@T_c=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	5.7	A
I_{AS}	Avalanche Current	9	A
$P_D@T_c=25^{\circ}C$	Total Power Dissipation	72	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	200	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V	---	---	1	μA
		V _{DS} =160V, V _{GS} =0V, T _c =125	---	---	10	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V, V _{DS} =0A	---	---	±100	nA
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	2	---	4	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =4.5A	---	0.235	0.27	Ω
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	720	920	pF
C _{oss}	Output Capacitance		---	85	110	
C _{rss}	Reverse Transfer Capacitance		---	22	29	
t _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =100V, V _{GS} =10V, R _G =25Ω, I _D =9A	---	10	23	ns
t _r	Rise Time ^{3,4}		---	69	138	ns
t _{d(off)}	Turn-Off Delay Time ^{3,4}		---	59	118	ns
t _f	Fall Time ^{3,4}		---	63	128	ns
Q _g	Total Gate Charge ^{3,4}	V _{GS} =10V, V _{DS} =160V, I _D =9A	---	21	28	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	3.8	---	nC
Q _{gd}	Gate-Drain "Miller" Charge ^{3,4}		---	11	---	nC
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	9	A
I _{SM}	Pulsed Source Current		---	---	36	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =9A, T _J =25°C	---	---	1.45	V
T _{rr}	Reverse Recovery Time	I _F =9A, di/dt=100A/μs, T _J =25°C	---	140	---	ns
Q _{rr}	Reverse Recovery Charge		---	2.2	---	nC

Notes:

- 1, L=8mH, I_{AS}=9A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
- 2, Repetitive Rating : Pulse width limited by maximum junction temperature
- 3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
- 4, Essentially Independent of Operating Temperature



Typical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

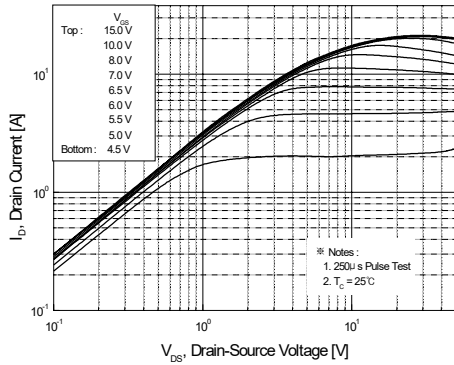


Figure 1. On-Region Characteristics

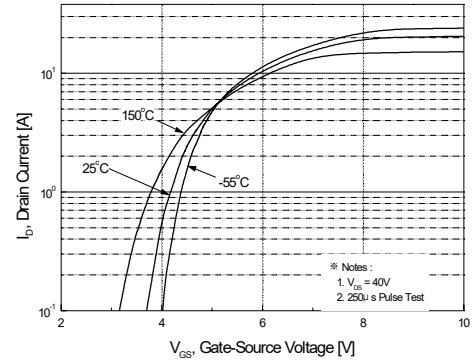


Figure 2. Transfer Characteristics

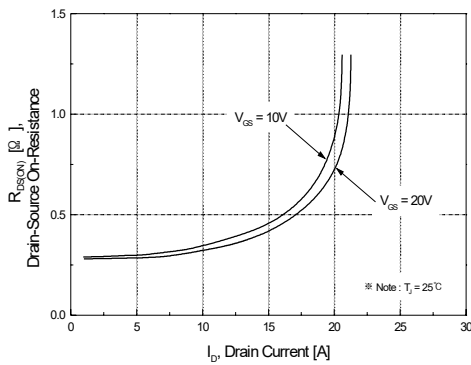


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

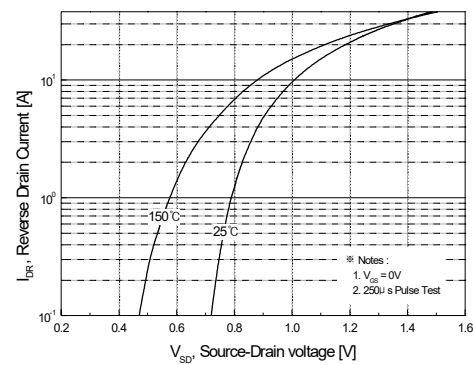


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

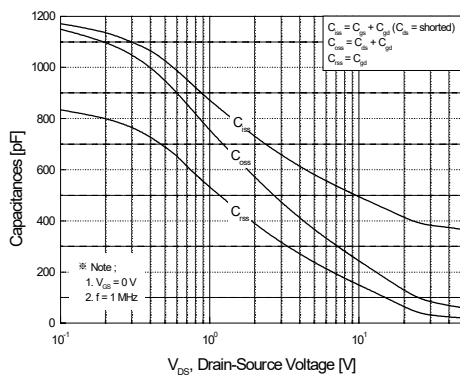


Figure 5. Capacitance Characteristics

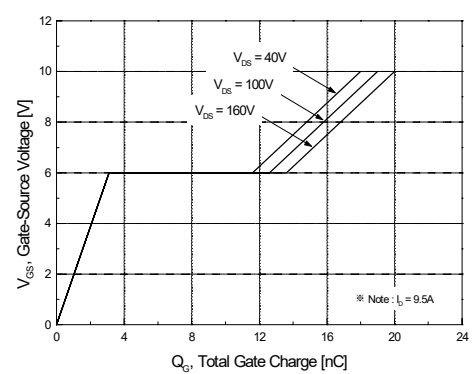


Figure 6. Gate Charge Characteristics

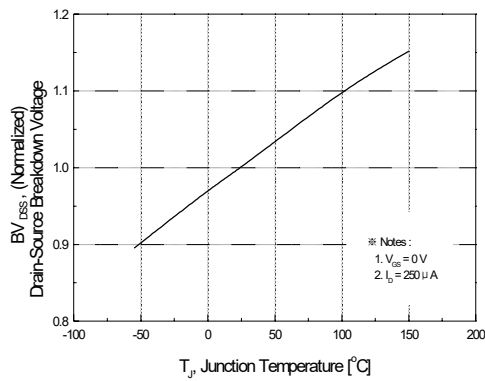


Figure 7. Breakdown Voltage Variation vs Temperature

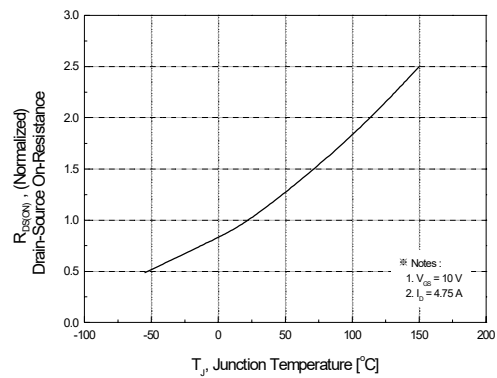


Figure 8. On-Resistance Variation vs Temperature

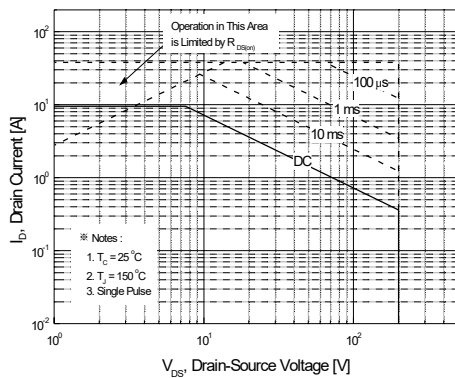


Figure 9-1. Maximum Safe Operating Area

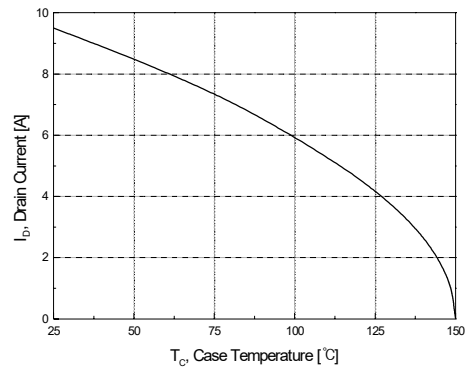


Figure 10. Maximum Drain Current vs Case Temperature

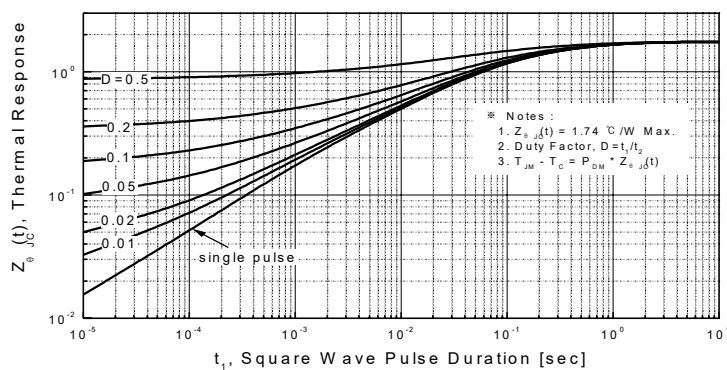
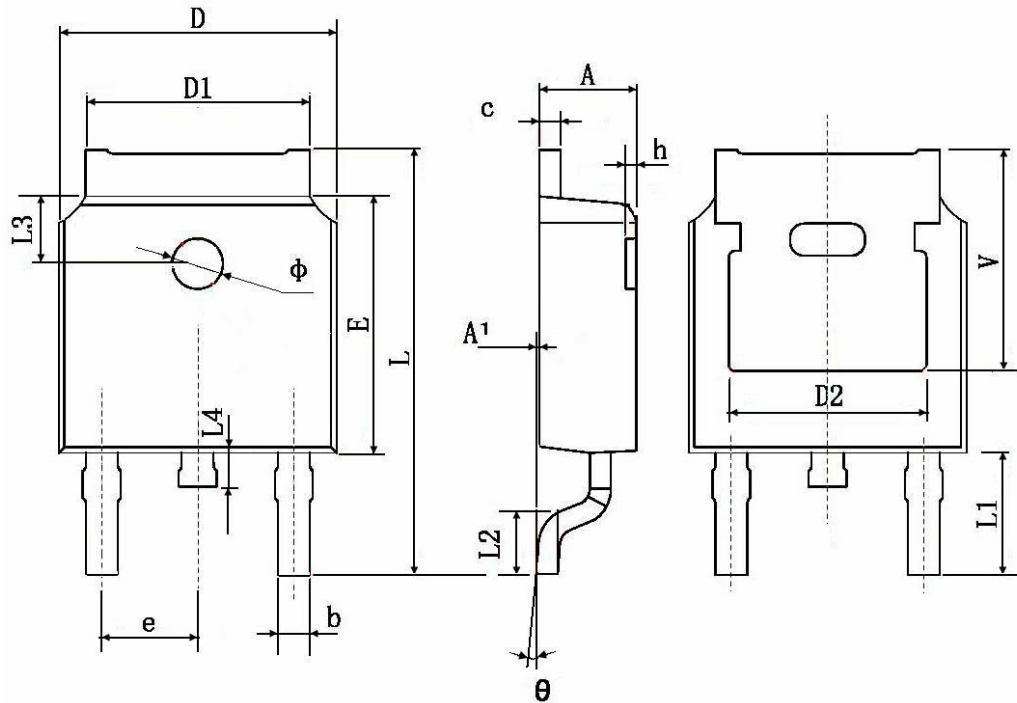


Figure 11-1. Transient Thermal Response Curve

TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



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