



General Description

The FDD86102 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge,fast switching and excellent avalanche characteristics.This device is specially designed to get better ruggedness.

General Features

$V_{DS} = 100V$ $I_D = 40A$

$R_{DS(ON)} < 23m\Omega @ V_{GS}=10V$

Applications

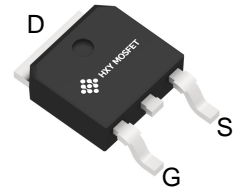
Consumer electronic power supply

Motor control

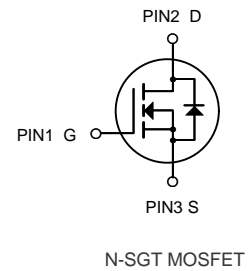
Synchronous-rectification

Isolated DC

Synchronous-rectification applications



TO-252-2L



Ordering Information

Product ID	Pack	Brand	Qty(PCS)
FDD86102	TO-252-2L	HXY MOSFET	2500

Absolute Maximum Ratings at $T_j=25^\circ C$ unless otherwise noted

Symbol	Parameter	Value	Unit
VDS	Drain source voltage	100	V
VGS	Gate source voltage	± 20	V
ID	Continuous drain current , $T_C=25^\circ C$	40	A
ID, pulse	Pulsed drain current , $T_C=25^\circ C$	100	A
P_D	Power dissipation , $T_C=25^\circ C$	27	W
EAS	Single pulsed avalanche energy	16	mJ
Tstg, Tj	Operation and storage temperature	-55 to 150	$^\circ C$
R θ JC	Thermal resistance, junction-case	4.65	$^\circ C/W$
R θ JA	Thermal resistance, junction-ambient	62	$^\circ C/W$



Electrical Characteristics at $T_j=25\text{ }^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS} = 80V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.8	2.6	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10V, I_D = 15A$	-	20	23	m Ω
		$V_{GS} = 4.5V, I_D = 10A$	-	-	33	m Ω
g_{fs}	Forward Threshold Voltage	$V_{DS} = 10V, I_D = 20A$	-	22	-	S
R_g	Gate Resistance	$V_{DS} = V_{GS} = 0V, f = 1.0MHz$	-	1.62	-	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0MHz$	-	822	-	pF
C_{oss}	Output Capacitance		-	310	-	pF
C_{rss}	Reverse Transfer Capacitance		-	23.5	-	pF
Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS} = 50V, I_D = 20A,$ $V_{GS} = 10V$	-	22.7	-	nC
Q_{gs}	Gate-Source Charge		-	6.2	-	
Q_{gd}	Gate-Drain("Miller") Charge		-	5.3	-	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 50V, I_D = 20A,$ $R_G = 3\Omega, V_{GS} = 10V$	-	15	-	ns
t_r	Turn-On Rise Time		-	3.2	-	
$t_{d(off)}$	Turn-Off Delay Time		-	30	-	
t_f	Turn-Off Fall Time		-	7.6	-	
Diode Characteristics						
I_S	Continuous Source Current		-	-	40	A
V_{SD}	Diode Forward Voltage	$I_S = 20A, V_{GS} = 0V$	-	0.88	1.0	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 20A,$	-	45	-	ns
Q_{rr}	Reverse Recovery Charge	$di_{SD}/dt = 100A/\mu s$	-	59	-	nC

Notes:

1. The value of $R_{\theta JC}$ is measured in a still air environment with $T_A = 25^\circ C$ and the maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $T_{J(MAX)} = 150^\circ C$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
3. Single pulse width limited by junction temperature $T_{J(MAX)} = 150^\circ C$.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.
5. The maximum current rating is package limited.
6. The EAS data shows Max. rating. The test condition is $V_{DS} = 50V, V_{GS} = 10V, L = 0.5mH$



Electrical Characteristics Diagrams

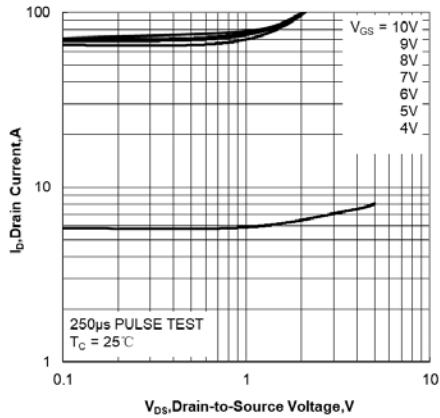


Figure 1. Output Characteristics

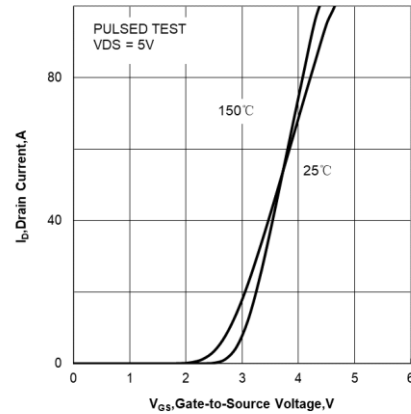


Figure 2. Transfer Characteristics

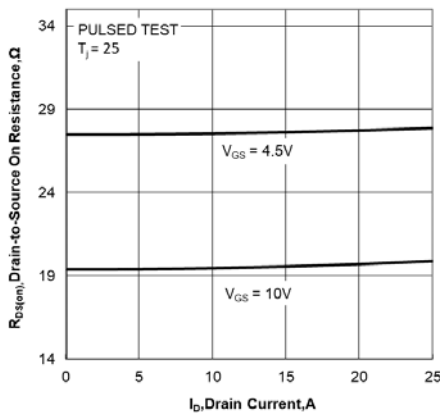


Figure 3. Drain-to-Source On Resistance vs Drain Current

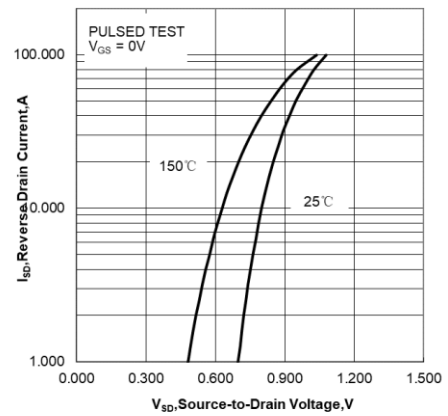


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

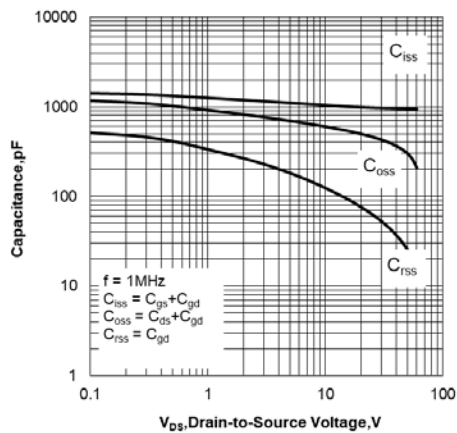


Figure 5. Capacitance Characteristics

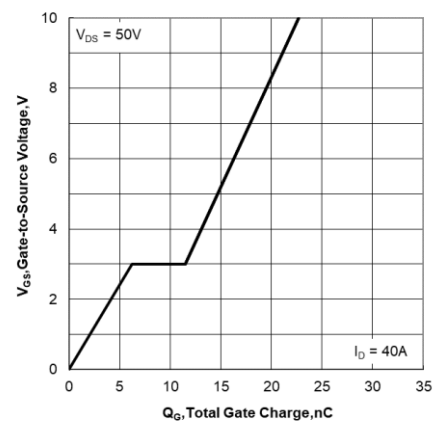


Figure 6. Gate Charge Characteristics

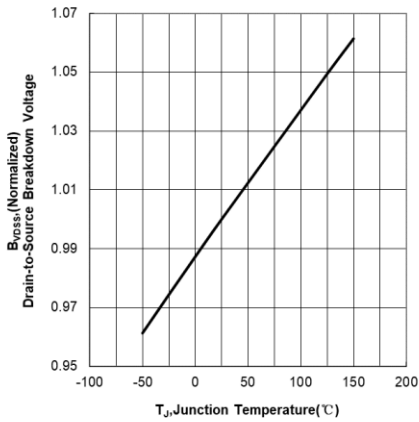


Figure 7. Normalized Breakdown Voltage vs Junction Temperature

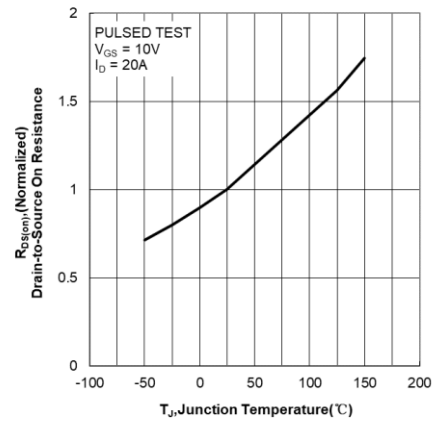


Figure 8. Normalized On Resistance vs Junction Temperature

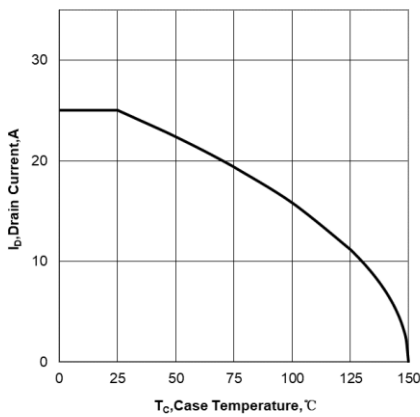


Figure 9. Maximum Continuous Drain Current vs Case Temperature

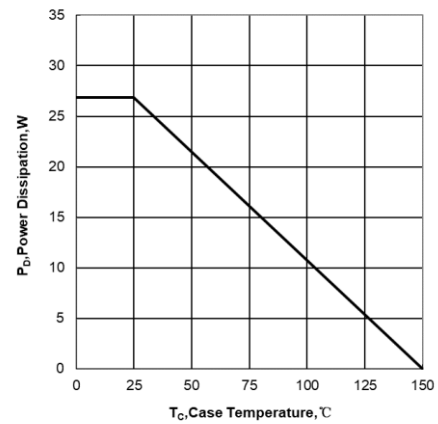


Figure 10. Maximum Power Dissipation vs Case Temperature

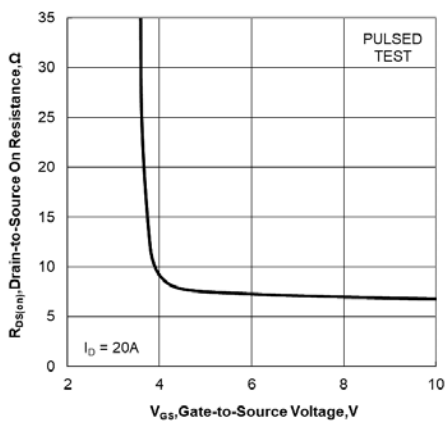


Figure 11. Drain-to-Source On Resistance vs Gate

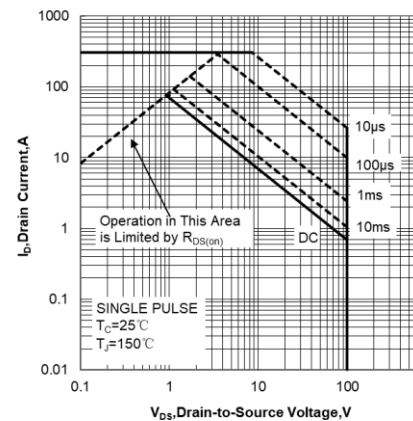


Figure 12. Maximum Safe Operating Area

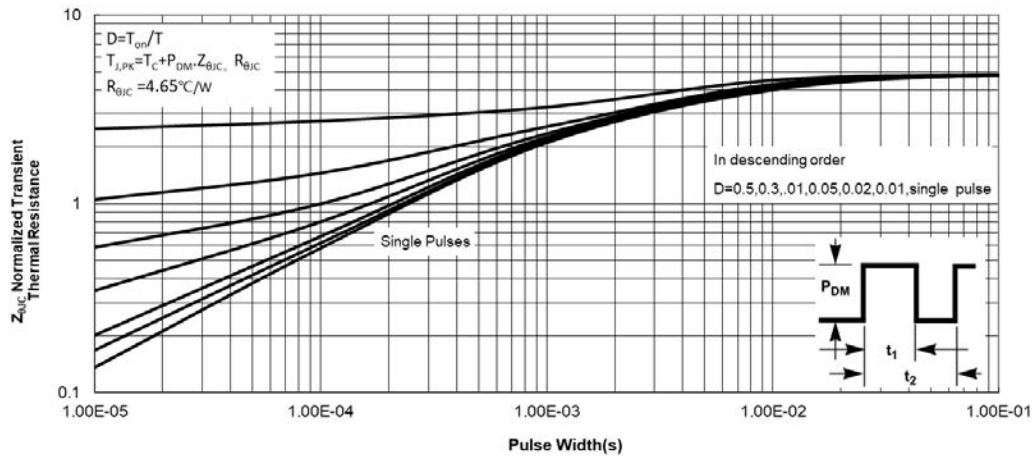
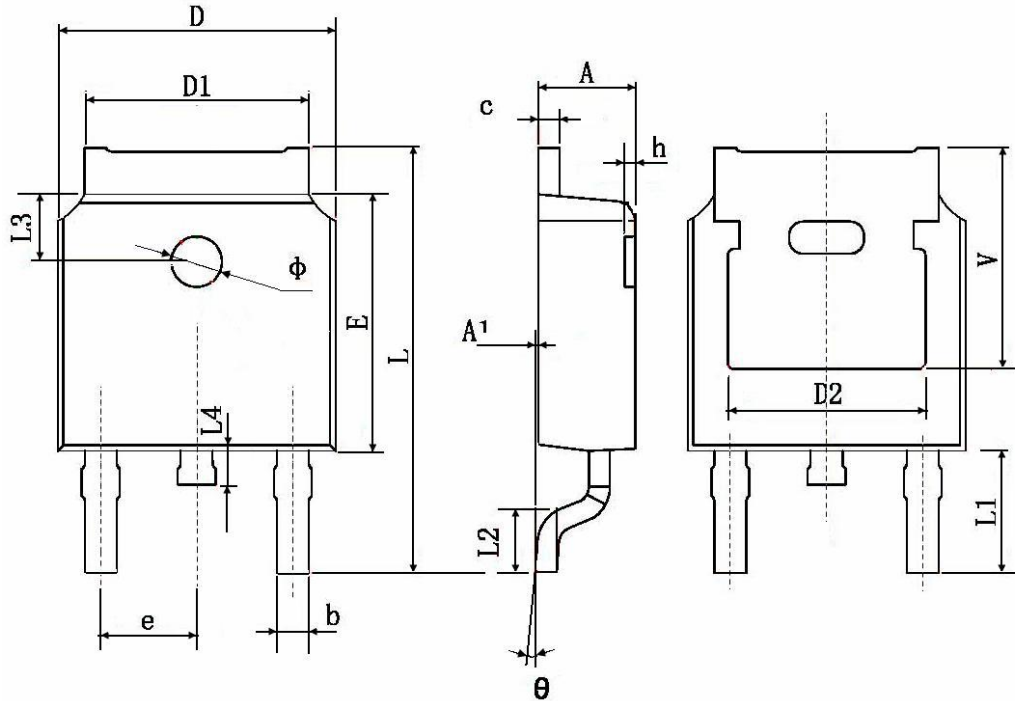


Figure 13. Maximum Effective Transient Thermal Impedance, Junction-to-Case



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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