



## General Description

The FDD86110 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

$V_{DS} = 100V$   $I_D = 70A$

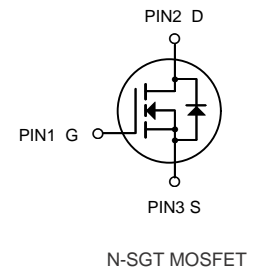
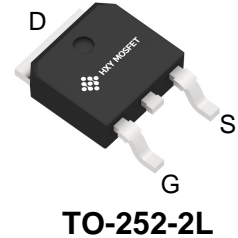
$R_{DS(ON)} < 10.5m\Omega @ V_{GS}=10V$

## Applications

DC-DC Converters

Power management functions

Synchronous-rectification applications



## Ordering Information

Product ID	Pack	Brand	Qty(PCS)
FDD86110	TO-252-2L	HXY MOSFET	2500

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

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain source voltage	100	V
$V_{GS}$	Gate source voltage	$\pm 20$	V
$I_D$	Continuous drain current, $T_C=25^\circ C$	70	A
$P_D$	Power dissipation, $T_C=25^\circ C$	100	W
EAS	Single pulsed avalanche energy	110	mJ
Tstg, $T_j$	Operation and storage temperature	-55 to 150	$^\circ C$
$R_{\theta JC}$	Thermal resistance, junction-case	1.25	$^\circ C/W$
$R_{\theta JA}$	Thermal resistance, junction-ambient	64	$^\circ C/W$



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

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$V_{DSS}$	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
$I_{DSS}$	Drain to Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	--	--	1	$\mu A$
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V, V_{DS}=0V$	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V, V_{DS}=0V$	--	--	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.3	1.8	2.3	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=20A$	--	8.5	10.5	$m\Omega$
		$V_{GS}=4.5V, I_D=15A$		9.5	15	$m\Omega$
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 1.0MHz$	--	1368	--	pF
$C_{oss}$	Output Capacitance		--	451	--	
$C_{rss}$	Reverse Transfer Capacitance		--	12.9	--	
$R_g$	Gate resistance	$V_{GS}=0V, V_{DS}$ Open	--	0.48	--	$\Omega$
$t_{d(ON)}$	Turn-on Delay Time	$I_D = 10A$ $V_{DS} = 50V$ $V_{GS} = 10V$ $R_G = 4\Omega$	--	16	--	ns
$t_r$	Rise Time		--	10	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	40	--	
$t_f$	Fall Time		--	6	--	
$Q_g$	Total Gate Charge	$V_{GS} = 10V$	--	31.3	--	nC
$Q_{gs}$	Gate Source Charge	$V_{DS} = 50V$	--	3.49	--	
$Q_{gd}$	Gate Drain Charge	$I_D = 10A$	--	7.63	--	
$I_S$	Diode Forward Current	$T_C = 25^\circ\text{C}$	--	--	70	A
$V_{SD}$	Diode Forward Voltage	$I_S=10A, V_{GS}=0V$	--	--	1.2	V
$t_{rr}$	Reverse Recovery time	$I_S=10A, V_{DD}=50V$ $di/dt=100A/\mu s$	--	103	--	ns
$Q_{rr}$	Reverse Recovery Charge		--	187	--	nC

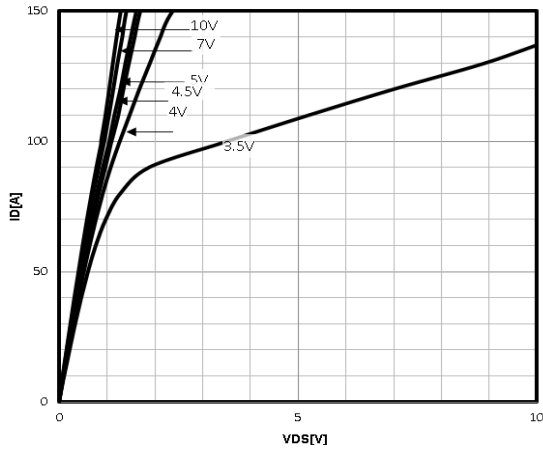
a1: Repetitive rating; pulse width limited by maximum junction temperature

a2:  $V_{DD}=50V, L=0.3mH, R_g=25\Omega, \text{Starting } T_J=25^\circ\text{C}.$

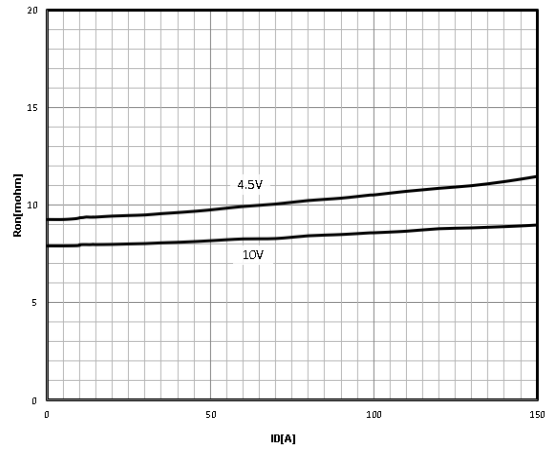


## Typical Characteristics

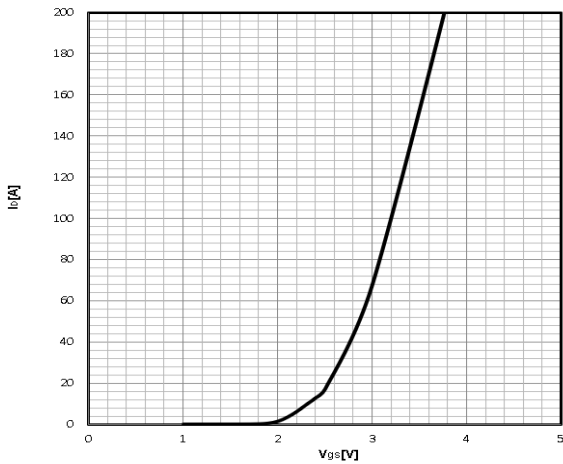
**Typ. output characteristics**  
 $I_D = f(V_{DS})$



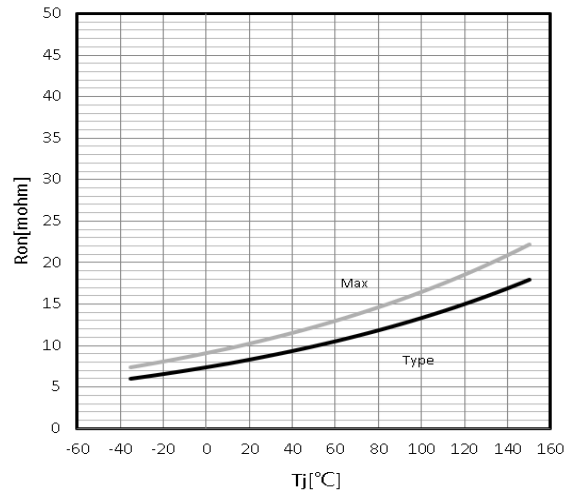
**Typ. drain-source on resistance**  
 $R_{DS(on)} = f(I_D)$



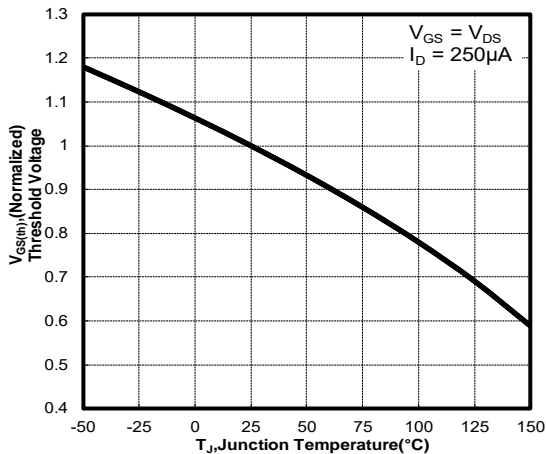
**Typ. transfer characteristics**  
 $I_D = f(V_{GS})$



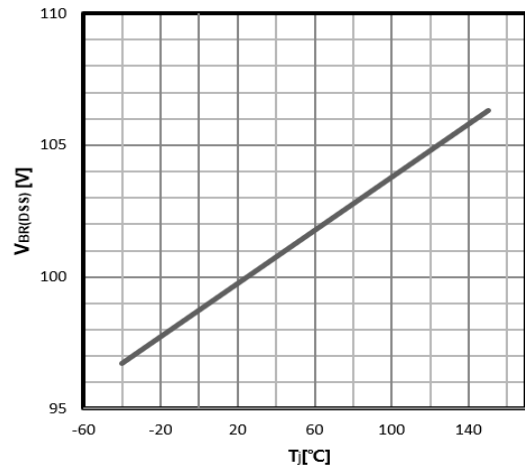
**Drain-source on-state resistance**  
 $R_{DS(on)} = f(T_j); I_D = 20A; V_{GS} = 10V$



**Gate Threshold Voltage**  
 $V_{TH} = f(T_j); I_D = 250\mu A$



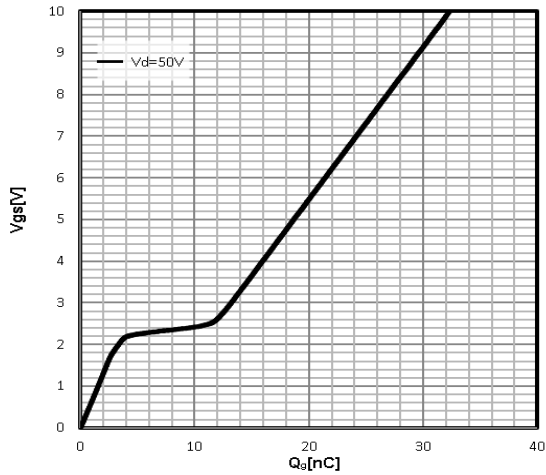
**Drain-source breakdown voltage**  
 $V_{BR(DSS)} = f(T_j); I_D = 250\mu A$





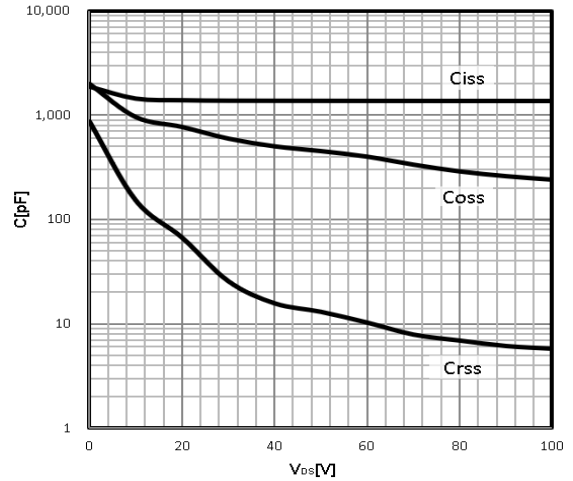
### Typ. gate charge

$$V_{GS}=f(Q_g); I_D=10A$$



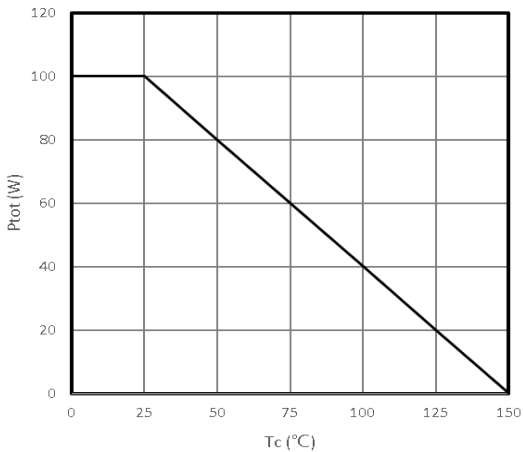
### Typ. capacitances

$$C=f(V_{DS}); V_{GS}=0V; f=1MHz$$



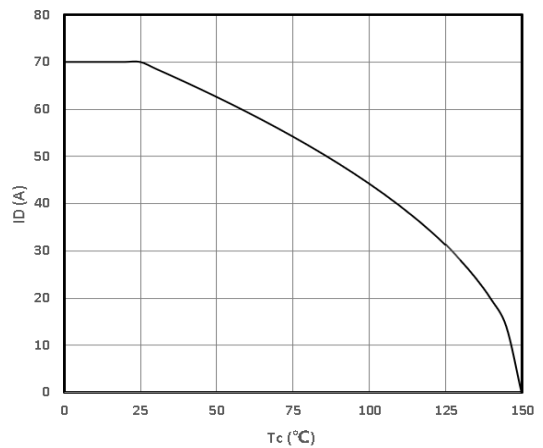
### Power Dissipation

$$P_{tot}=f(T_c)$$



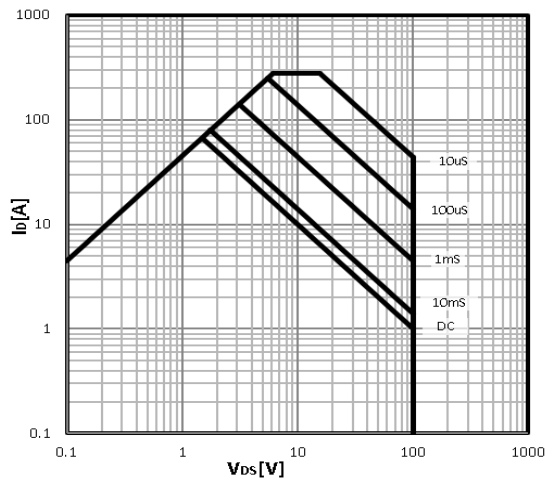
### Maximum Drain Current

$$I_D=f(T_c)$$



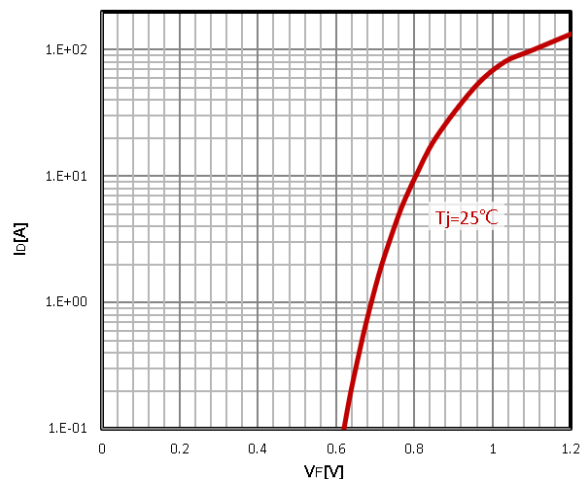
### Safe operating area

$$I_D=f(V_{DS})$$



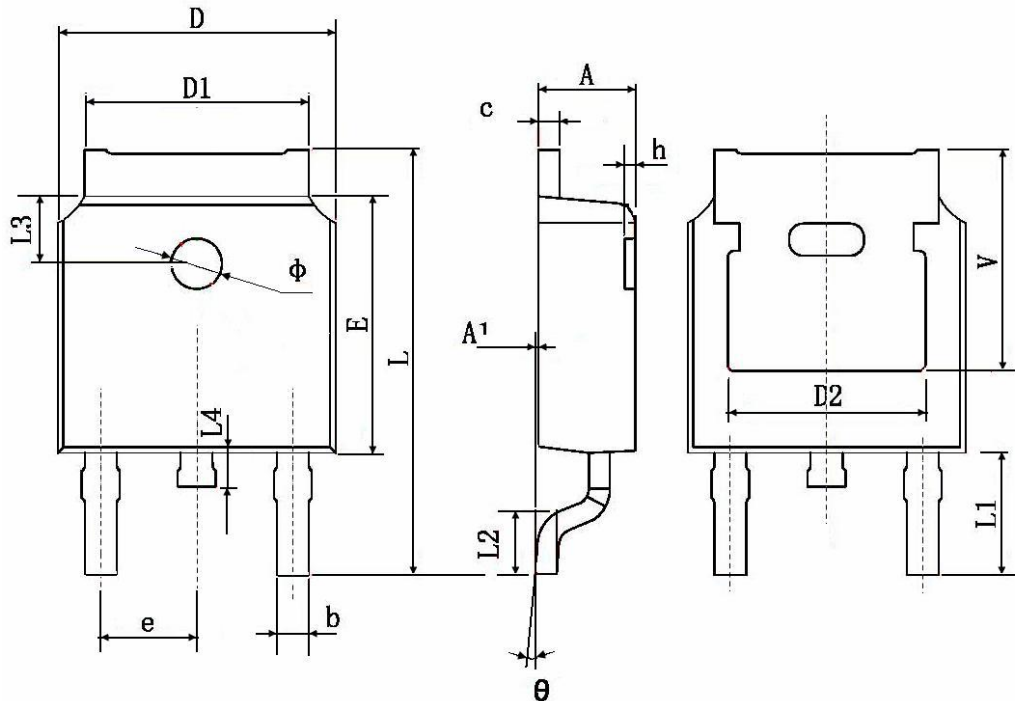
### Body Diode Forward Voltage Variation

$$I_F=f(V_{GS})$$





### 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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