HY1306D/U/V

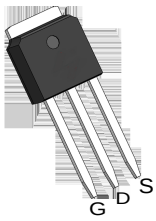
N-Channel Enhancement Mode MOSFET

Feature

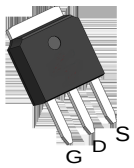
- 60V/25A
  $R_{DS(ON)}$= 38mΩ(typ.)@V_{GS} = 10V
  $R_{DS(ON)}$= 43mΩ(typ.)@V_{GS} = 4.5V
- 100% Avalanche Tested
- Reliable and Rugged
- Halogen Free and Green Devices Available (RoHS Compliant)

Pin Description

TO-252-2L



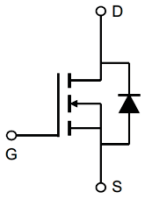
TO-251-3L



TO-251-3S

Applications

- Power Management for Inverter Systems
- Synchronous Rectification



N-Channel MOSFET

Ordering and Marking Information

D	U	V
HY1306	HY1306	HY1306
YYXXXJWW G	YYXXXJWW G	YYXXXJWW G

Package Code

D: TO-252-2L U: TO-251-3L V:TO-251-3S

Date Code
YYXXX WW

Assembly Material
G:Halogen Free

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (Tc=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		-55 to 150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Source Current-Continuous(Body Diode)	Tc=25°C	25	A
Mounted on Large Heat Sink				
I_{DM}	Pulsed Drain Current *	Tc=25°C	72	A
I_D	Continuous Drain Current	Tc=25°C	25	A
		Tc=100°C	15.8	A
P_D	Maximum Power Dissipation	Tc=25°C	34.7	W
		Tc=100°C	13.9	W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		3.6	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient **		110	°C/W
E_{AS}	Single Pulsed-Avalanche Energy ***	L=0.3mH	10.8	mJ

Note: * Repetitive rating; pulse width limited by max. junction temperature.
** Surface mounted on FR-4 board.
*** Limited by $T_J$max , starting T_J=25°C, L = 0.3mH, R_G= 25Ω, V_{GS} =10V.

Electrical Characteristics(Tc =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HY1306 Min	HY1306 Typ.	HY1306 Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_{DS}=250μA	60	-	-	V
I_{DSS}	Drain-to-Source Leakage Current	V_{DS}=60V,V_{GS}=0V	-	-	1	μA
		T_J=125°C	-	-	50	μA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1	2	3	V
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$*	Drain-Source On-State Resistance	V_{GS}=10V,I_{DS}=20A	-	38	40	mΩ
		V_{GS}=4.5V,I_{DS}=20A	-	43	46	
Diode Characteristics						
V_{SD}*	Synchronous Rectification	I_{SD}=20A,V_{GS}=0V	-	0.9	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD}=20A,dI_{SD}/dt=100A/μs	-	43	-	ns
Q_{rr}	Reverse Recovery Charge		-	58	-	nC

Electrical Characteristics (Cont.) (Tc =25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	HY1306			Unit
			Min	Typ.	Max	
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1 MHz	-	3.5	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, Frequency=1.0MHz	-	480	-	pF
C_{oss}	Output Capacitance		-	212	-	
C_{rss}	Reverse Transfer Capacitance		-	50	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V,R_G=4Ω, I_{DS}=20A,V_{GS}=10V	-	13	-	ns
T_r	Turn-on Rise Time		-	18	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	39	-	
T_f	Turn-off Fall Time		-	24	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS} =48V, V_{GS}=10V， ID=20A	-	17.7	-	nC
Q_{gs}	Gate-Source Charge		-	1.7	-	
Q_{gd}	Gate-Drain Charge		-	7.3	-	

Note: *Pulse test，pulse width ≤ 300us，duty cycle ≤ 2%

Typical Operating Characteristics

Figure 1: Power Dissipation

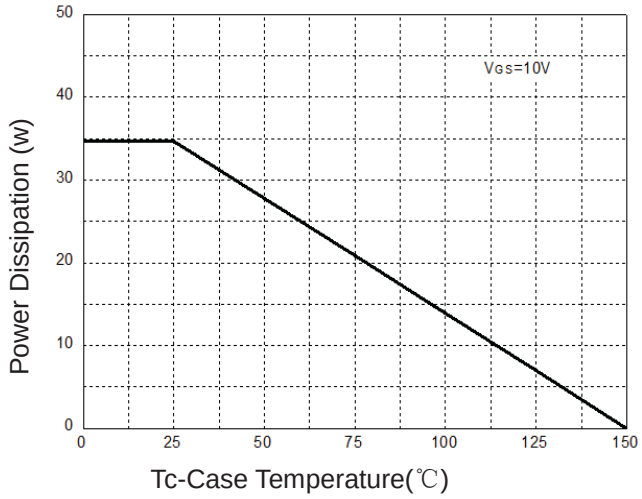


Figure 2: Drain Current

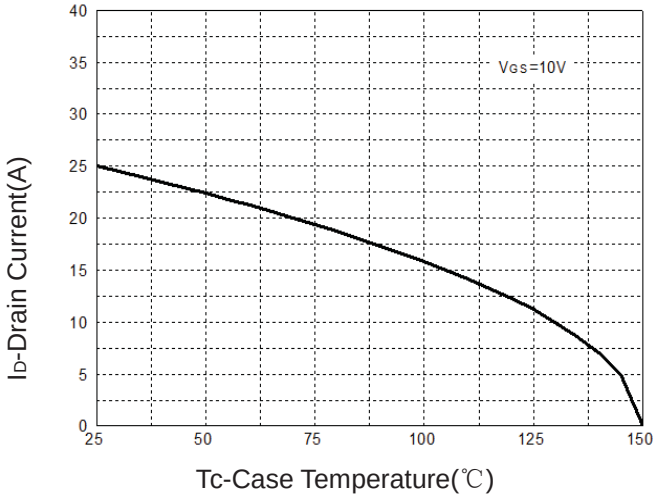


Figure 3: Safe Operation Area

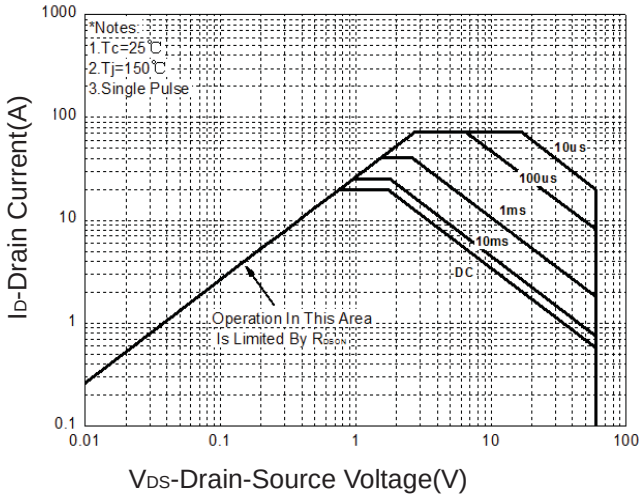


Figure 4: Thermal Transient Impedance

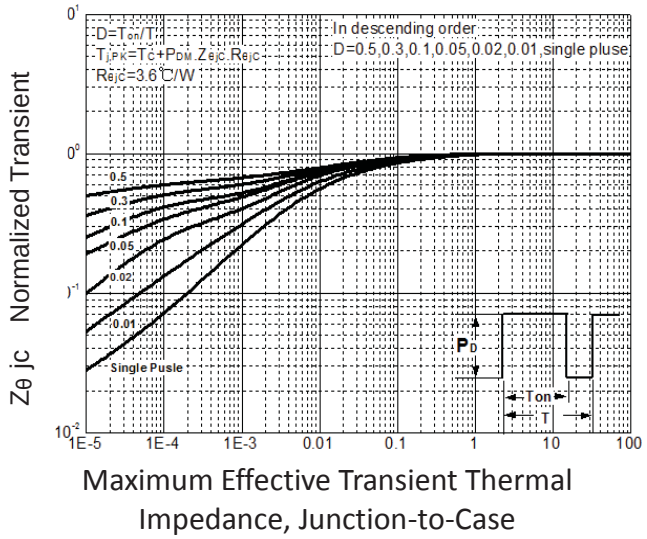


Figure 5: Output Characteristics

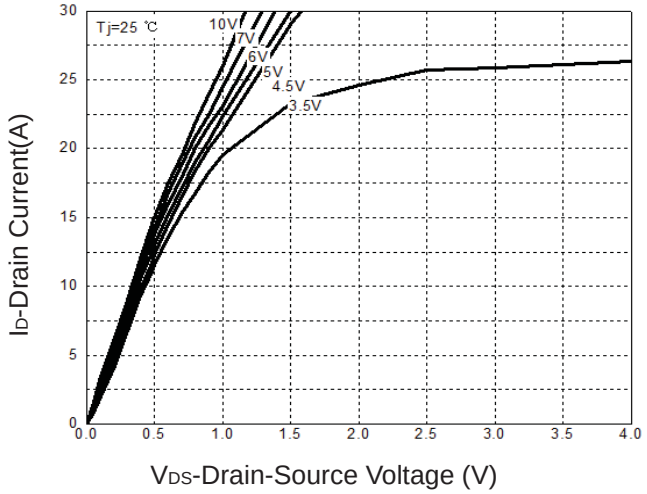


Figure 6: Drain-Source On Resistance