

FH1607D

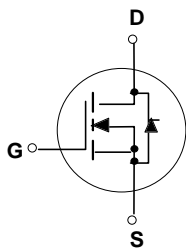
N-Channel Enhancement Mode MOSFET

Features

- 68V/70A
 $R_{DS(ON)} = 6.8\text{ m}\Omega$ (typ.) @ $V_{GS}=10\text{V}$
- 100% avalanche tested
- Reliable and Rugged

Applications

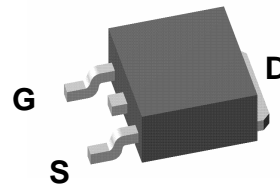
- Switching application
- Power Management for Inverter Systems.



Schematic diagram

TO-252


Marking and pin assignment



TO-252 Top View

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	68	V
V_{GSS}	Gate-Source Voltage	± 25	
T_J	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 70	A
Mounted on Large Heat Sink			
I_{DM}	Pulsed Drain Current *	280**	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 70	A
		$T_C=100^\circ\text{C}$ 60	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 75	W
		$T_C=100^\circ\text{C}$ 37.5	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	110	
Avalanche Ratings			
E_{AS}	Avalanche Energy, Single Pulsed	$L=0.5\text{mH}$ 280***	mJ

Note : * Repetitive rating ; pulse width limited by junction temperature

** Drain current is limited by junction temperature

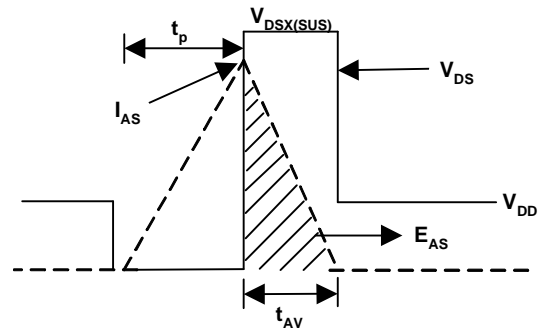
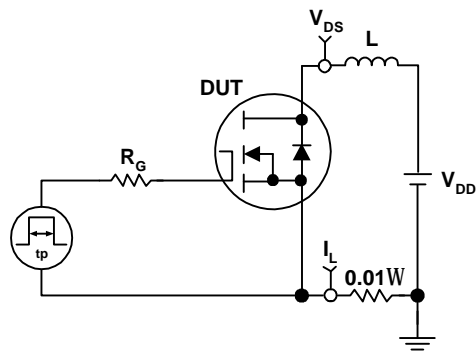
 *** $V_D=55\text{V}$

Electrical Characteristics ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

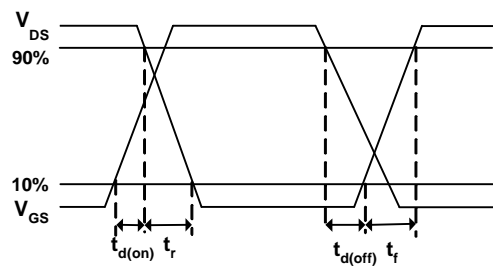
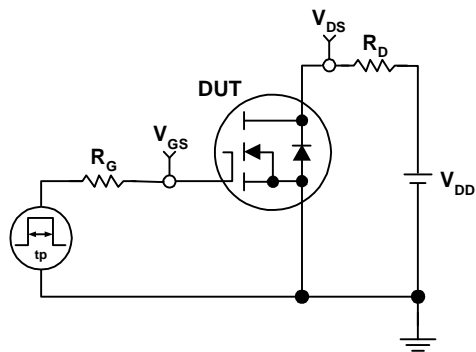
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	68	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=68V, V_{GS}=0V$ $T_J=85^\circ\text{C}$	-	-	1 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^*$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=35A$	-	6.8	8.5	m Ω
Diode Characteristics						
V_{SD}^*	Diode Forward Voltage	$I_{SD}=35A, V_{GS}=0V$	-	0.8	1	V
t_{rr}	Reverse Recovery Time	$I_{SD}=35A, dI_{SD}/dt=100A/\mu s$		33		ns
Q_{rr}	Reverse Recovery Charge		-	60	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.5	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ Frequency=1.0MHz	-	3200	-	pF
C_{oss}	Output Capacitance		-	351	-	
C_{rss}	Reverse Transfer Capacitance		-	290	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=34V, R_G=3\ \Omega,$ $I_{DS}=35A, V_{GS}=10V,$	-	14	-	ns
T_r	Turn on Rise Time			13		
$t_{d(OFF)}$	Turn-off Delay Time		-	20	-	
T_f	Turn-off Fall Time		-	7	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	$V_{DS}=55V, V_{GS}=10V,$ $I_{DS}=35A$	-	84	-	nC
Q_{gs}	Gate-Source Charge		-	13	-	
Q_{gd}	Gate-Drain Charge		-	27	-	

Note * : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Avalanche Test Circuit and Waveforms

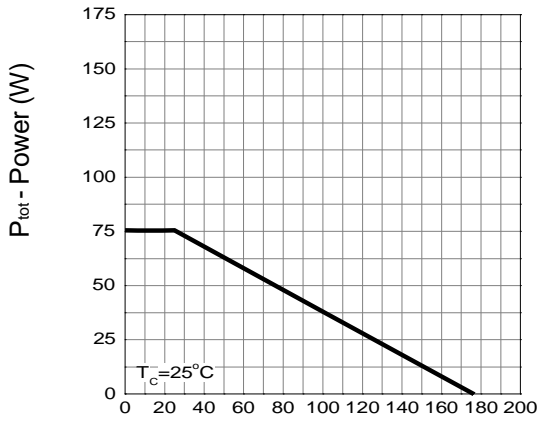


Avalanche Test Circuit and Waveforms



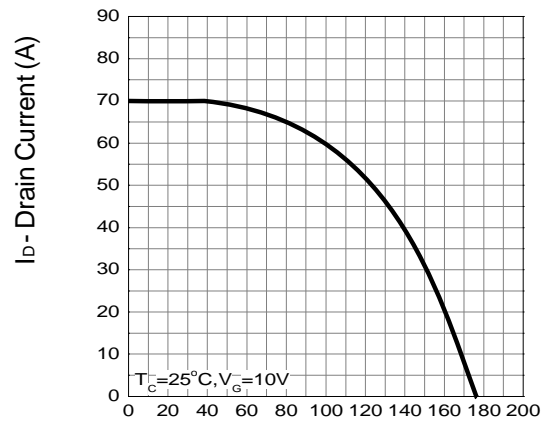
Typical Operating Characteristics

Power Dissipation



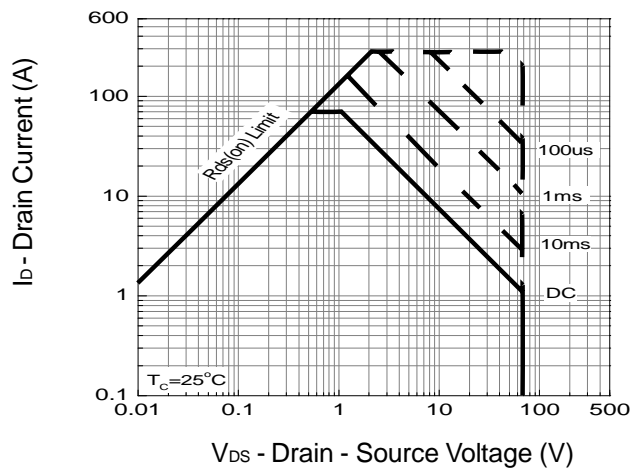
T_c - Case Temperature (°C)

Drain Current



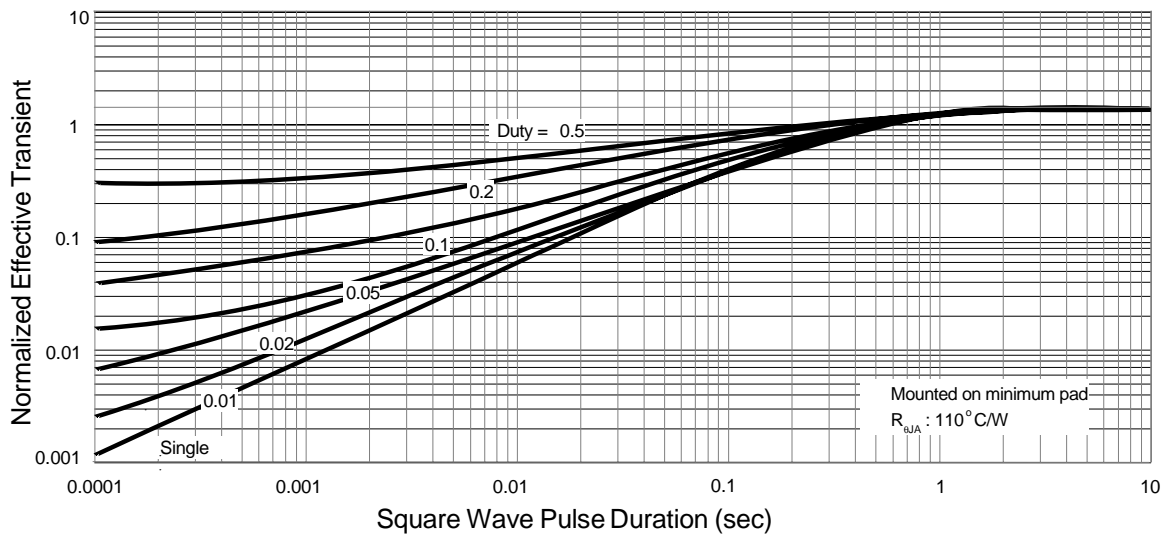
T_c - Case Temperature (°C)

Safe Operation Area



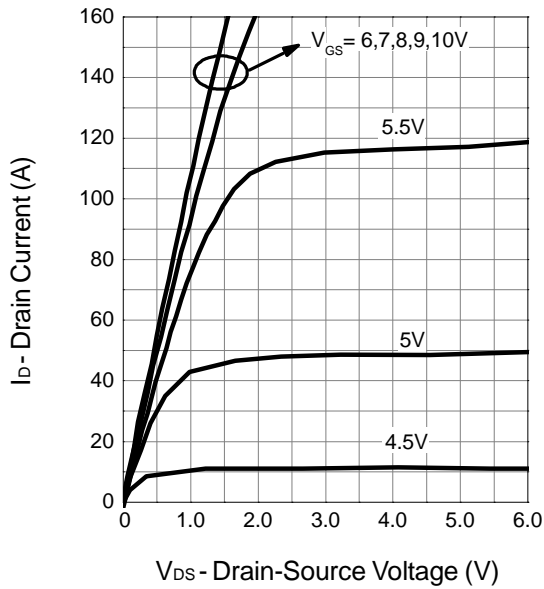
V_{DS} - Drain - Source Voltage (V)

Thermal Transient Impedance

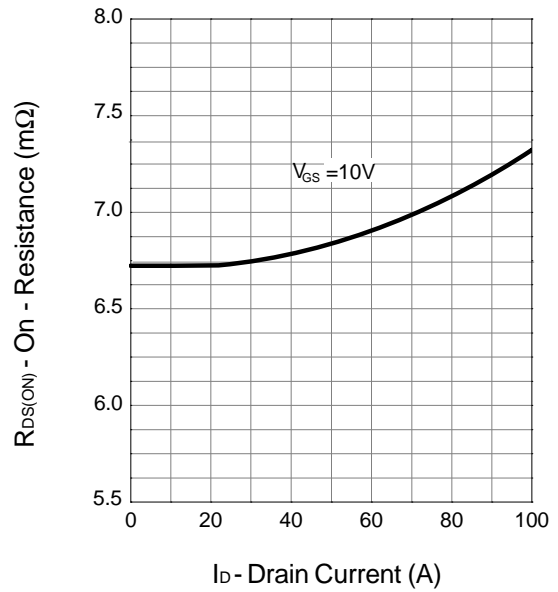


Typical Operating Characteristics (Cont.)

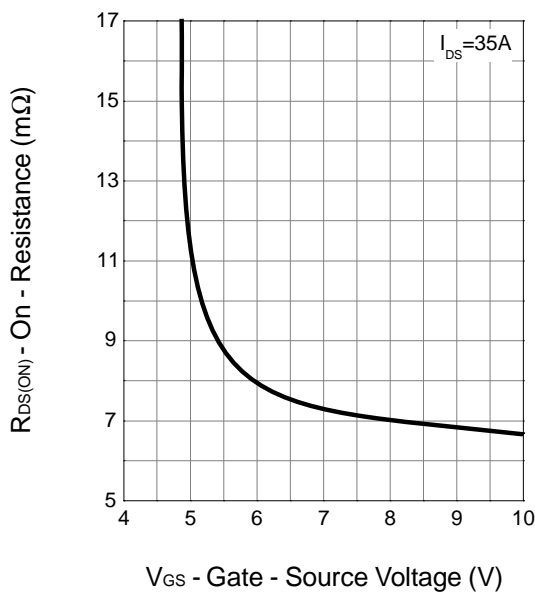
Output Characteristics



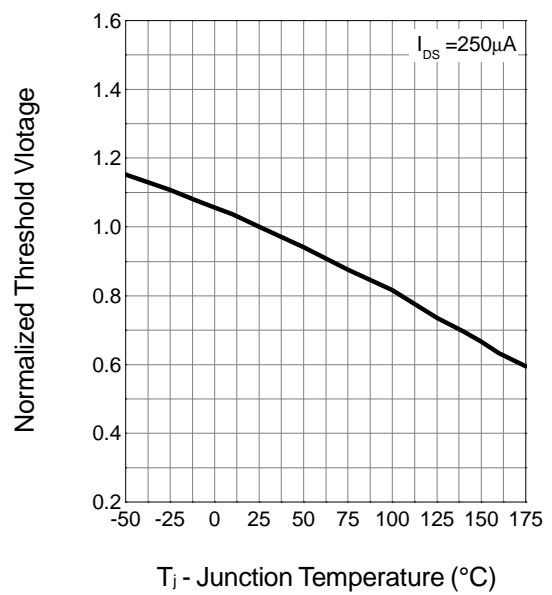
Drain-Source On Resistance



Drain-Source On Resistance

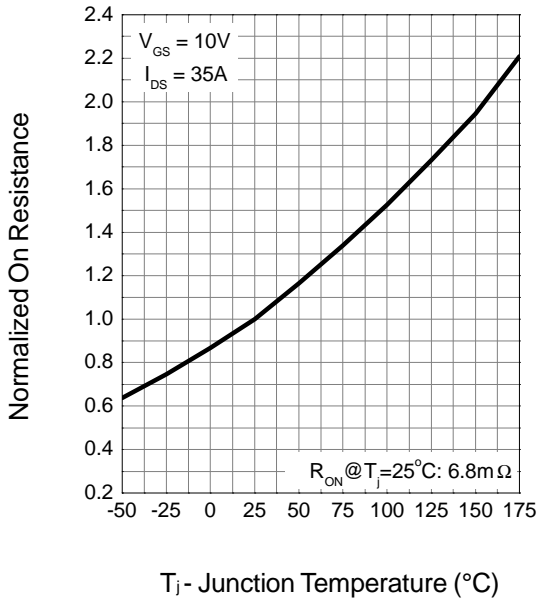


Gate Threshold Voltage

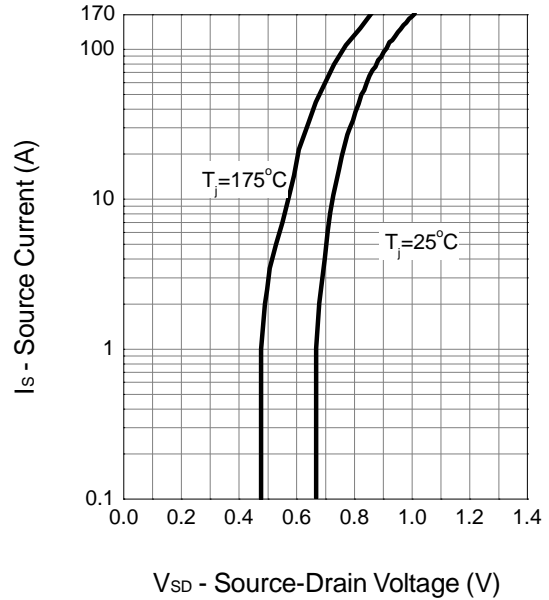


Typical Operating Characteristics (Cont.)

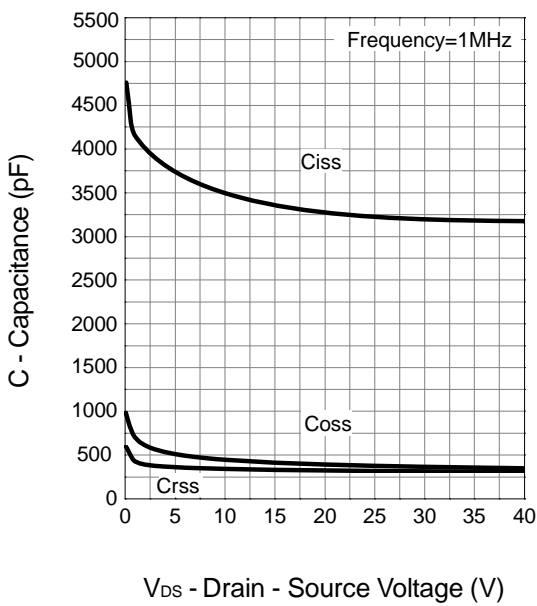
Drain-Source On Resistance



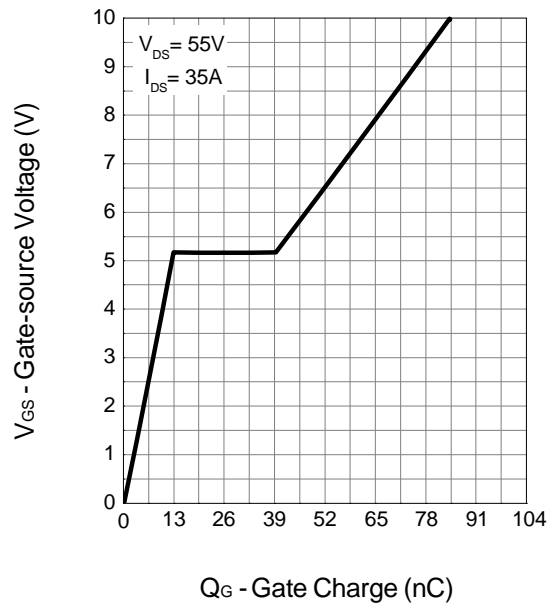
Source-Drain Diode Forward



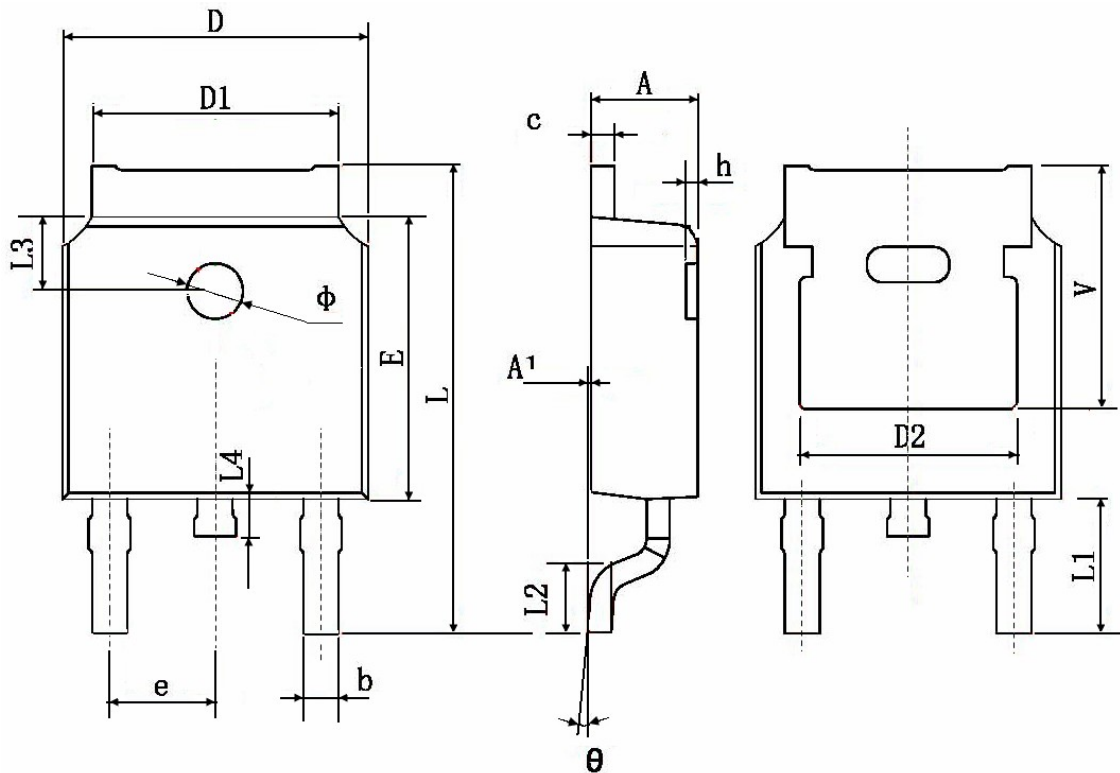
Capacitance



Gate Charge



Package Information : TO-252



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	4.830 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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