100V_{DS}／±20V_{GS}／15A(I_D) N-Channel Enhancement Mode MOSFET **HD1H15A**

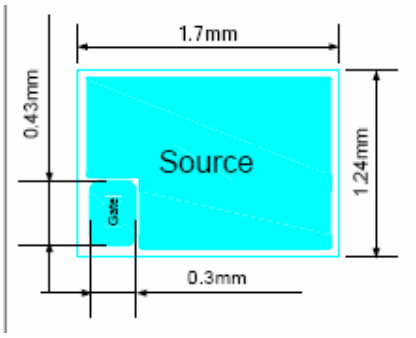
Features

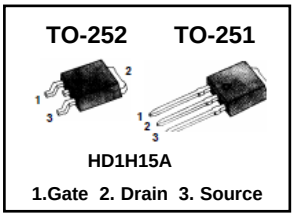
- V_{DSS}=100V／V_{GSS}=±20V／I_D=15A
  $R_{DS(ON)}$=105mΩ(Max.)@V_{GS}=10V
  $R_{DS(ON)}$=175mΩ(Max.)@V_{GS}=4.5V
- ESD protect
- Reliable and Rugged
- High Density Cell Design For Ultra Low On-Resistance

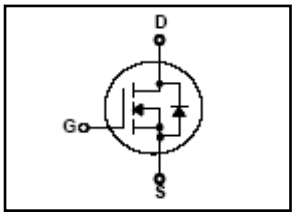
Applications

- Synchronous Rectification
- Power Management in Inverter System

Chip Diagram



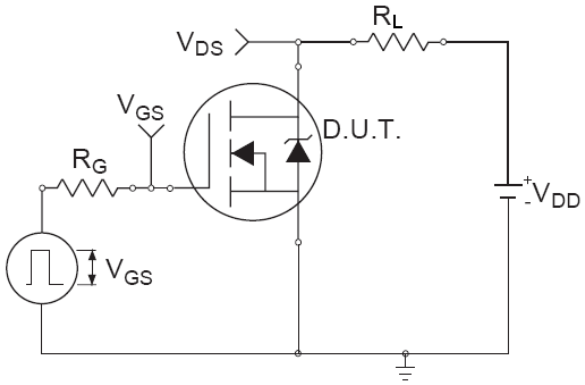


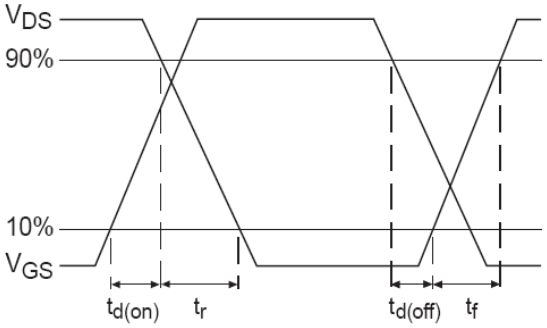


Physical Characteristics

- Wafer Diameter 8 inches (± 0.1 inche)
- Wafer Thickness: 8mils (±0.6 mil)
- Die size: 1700µm x 1240µm (Including scribe line)
- Scribe Line Width: 60um
- Gross die: 12,549
- Metalization:
  Frontside: Al/Si/Cu
  Backside: Ti/Ni/Ag
- Metal thickness:
  Front-side: 4.0µm
  Back0side: 1.4µm
- Bonding Area:
  Gate: 300µm x 430µm
  (Die edge to gate metal 34µm)
  Source: Full metalized surface of source region
  (Die edge to source metal 51µm)
- Recommended wire bonding:
  Gate:1.5mils Au wire x 1
  Source: 12mils Al wire x 1
- Recommended package: SOP-8(Dual)

Switching Time Test Circuit and Waveforms





Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate –Source Voltage		±20	V
I_D[1]	Continuous Drain Current	T_C=70°C	2.8	A
		T_C=25°C	3.5	A
I_{DM}[1]	300us Pulsed Drain Current Tested		14	A
I_S[1]	Diode Continuous Forward Current		3	A
T_J	Operating Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 ~ 150	°C

Note: 1: Surface Mounted on 1in^2 pad area, t ≦ 10sec..

2: UIS tested and pluse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

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

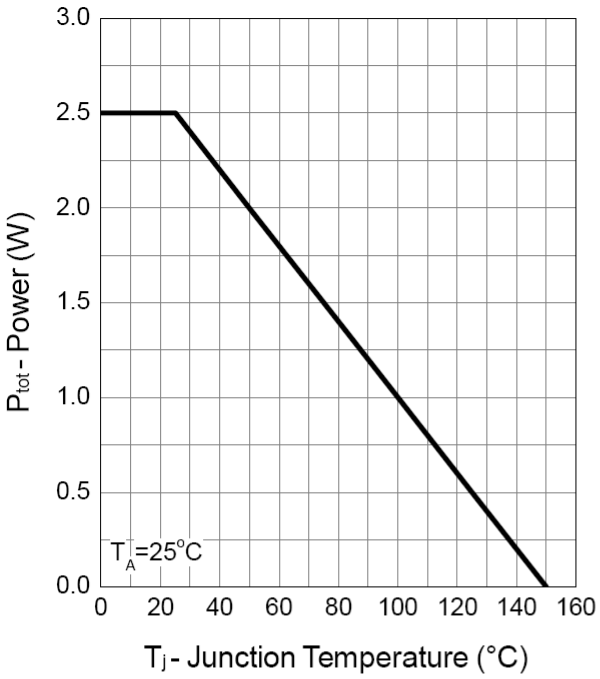
Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V,V_{GS}=0V			1	uA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.5	2	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±16V, V_{DS}=0V			±10	uA
$R_{DS(on)}$[1]	Drain-Source On-Resistance	V_{GS}=10V, I_D=3.5A		85	105	mΩ
		V_{GS}=4.5V, I_D=2A		135	175	
Diode Characteristics						
V_{SD}[1]	Diode Forward Voltage	I_{SD}=3A,V_{GS}=0V	0.6	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=15A,		36		ns
Q_{rr}	Reverse Recovery Charge	dI_{SD}/dt=100A/us		50		nC
Dynamic Characteristics[2]						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V Frequency=1MHz		900		pF
C_{oss}	Output Capacitance			60		
C_{rss}	Reverse Transfer Capacitance			40		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, R_L=30Ω I_D=1A, V_{GEN}=10V R_G=6Ω		8	15	ns
t_r	Turn-On Rise Time			6	11	
$t_{d(off)}$	Turn-Off Delay Time			40	75	
t_f	Turn-Off Fall Time			24	45	
Gate Charge Characteristics[2]						
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=10V I_D=15A		20		nC
Q_{gs}	Gate-Source Charge			3		
Q_{gd}	Gate-Drain Charge			3.1		

Note: 1: Pulse test ; pulse width ≦ 300ns, duty cycle ≦ 2%.

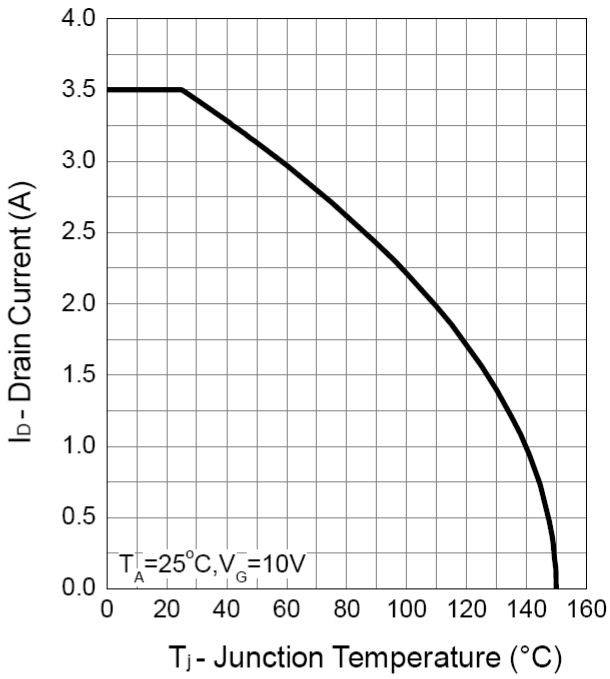
2: Guaranteed by design, not subject to production testing.

Typical Characteristics

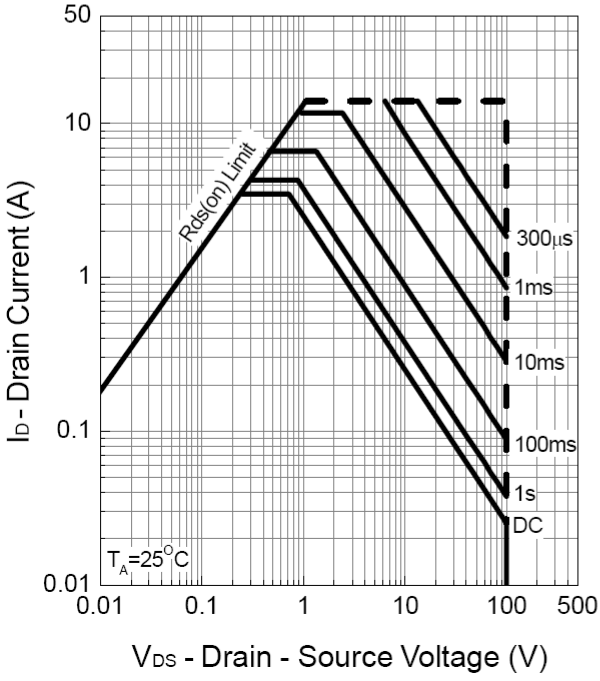
Power Dissipation



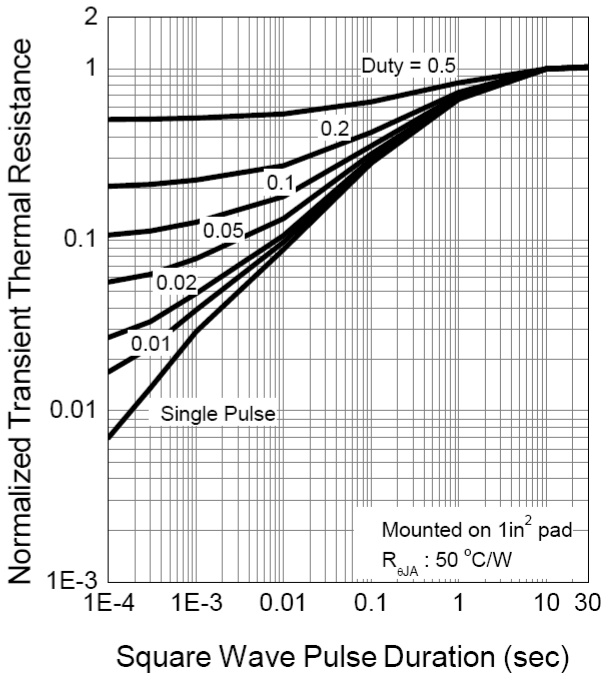
Drain Current



Safe Operation Area

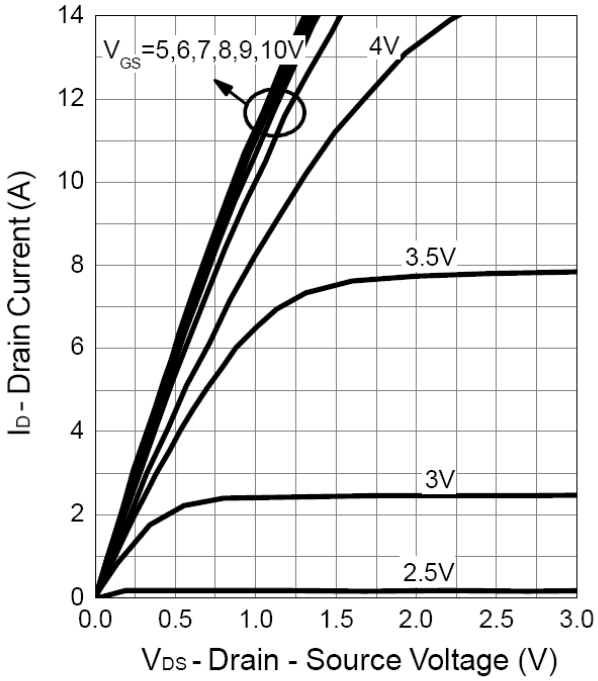


Thermal Transient Impedance

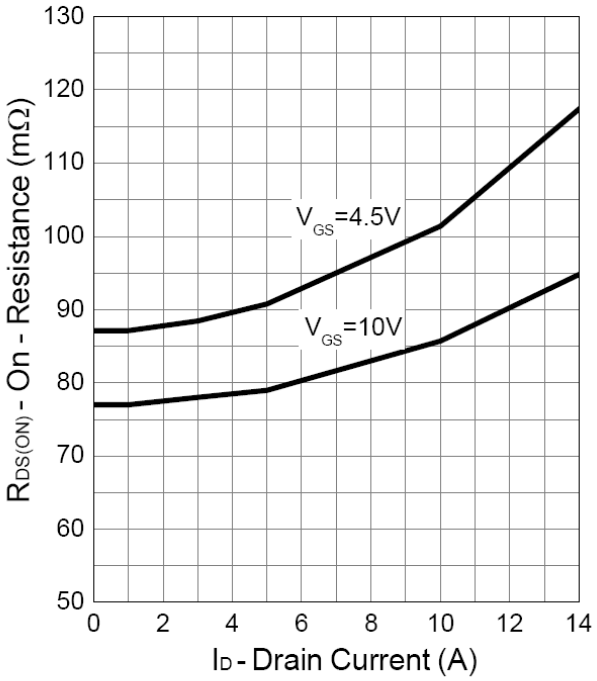


Typical Characteristics (Cont.)

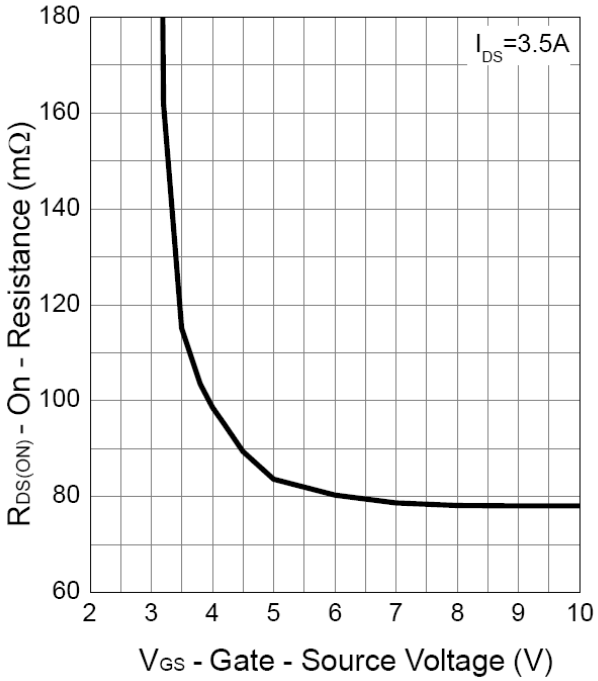
Output Characteristics



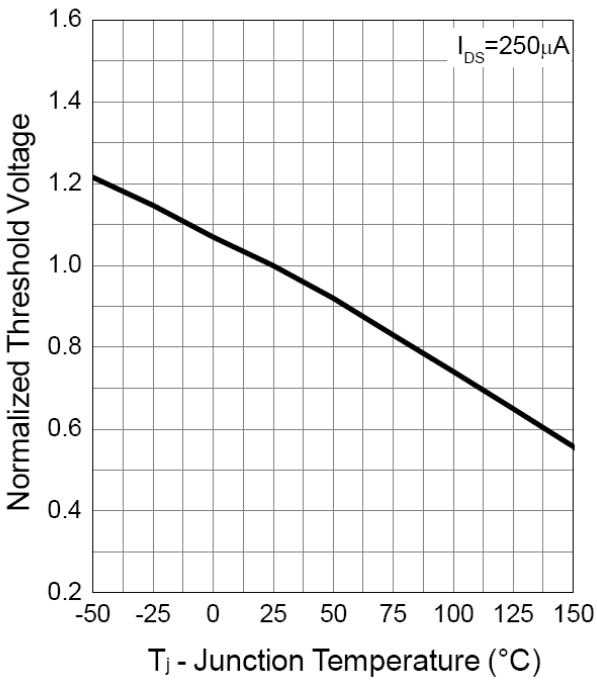
Drain-Source On Resistance



Gate-Source On Resistance

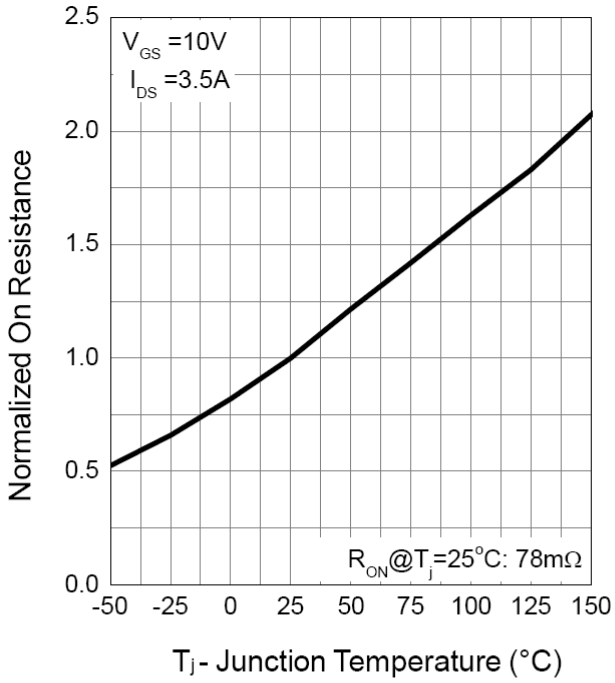


Gate Threshold Voltage

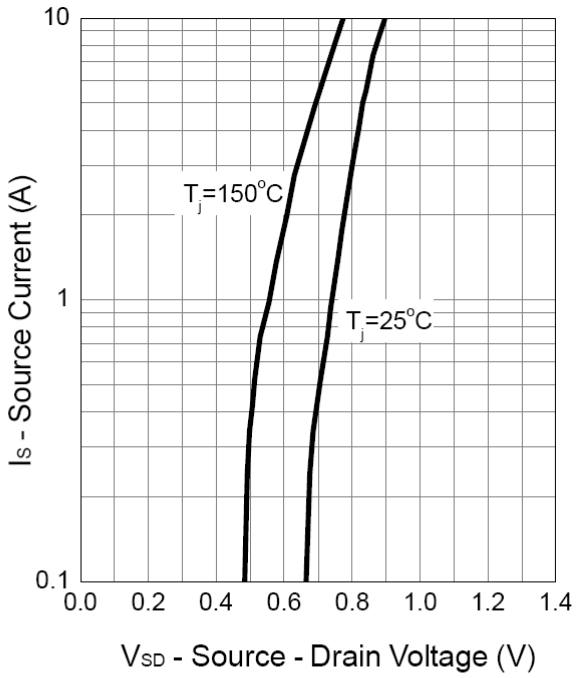


Typical Characteristics (Cont.)

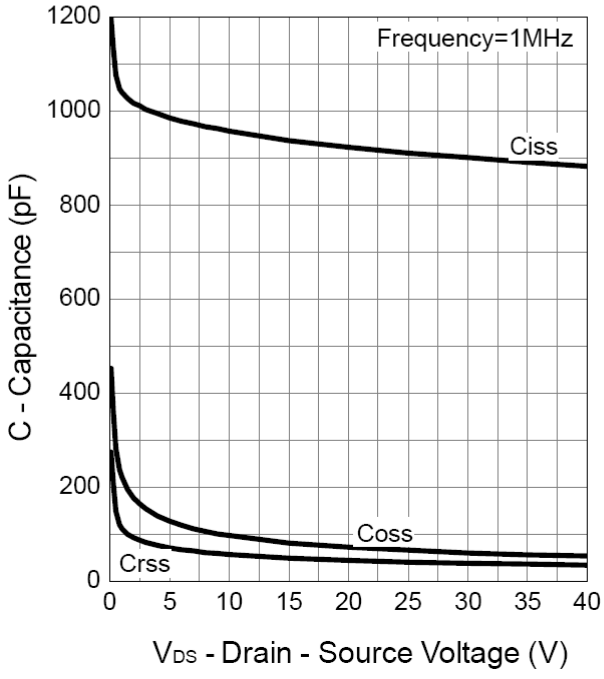
Drain-Source On Resistance



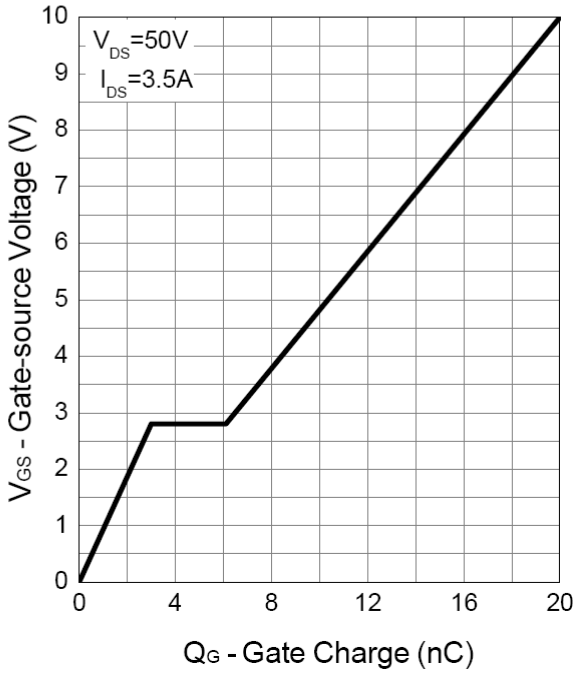
Source-Drain Diode Forward



Capacitance

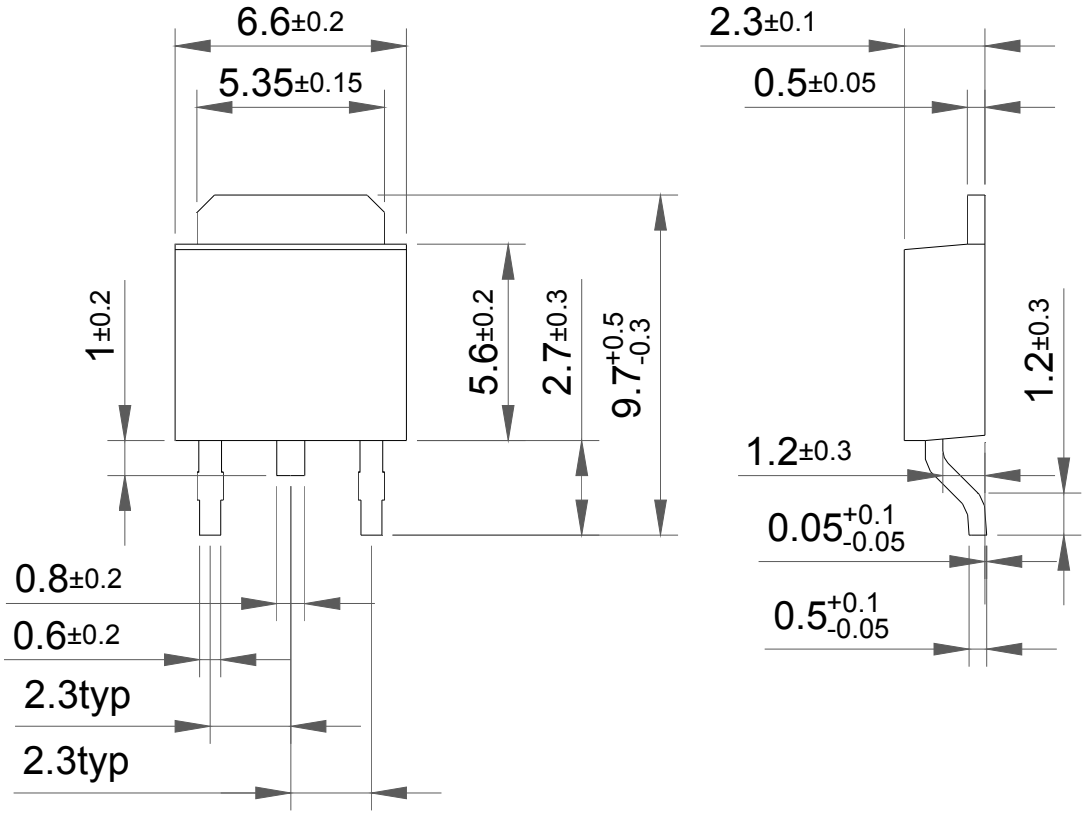


Gate Charge



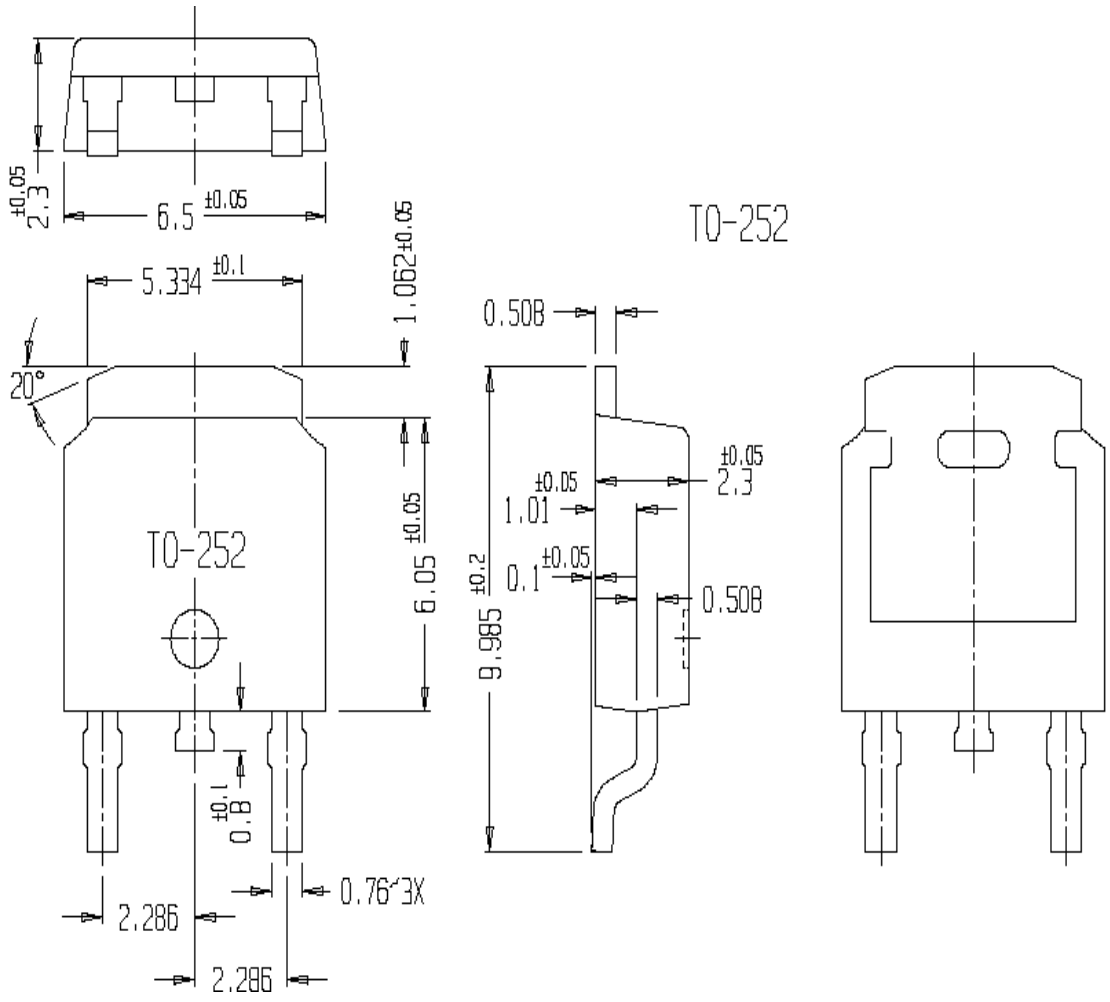
Package Dimension

TO-252



Package Dimension

TO-252



Package Dimension

TO-251