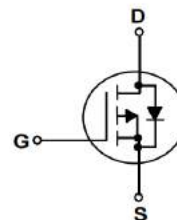
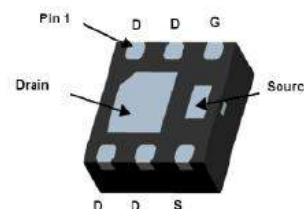


## Features

- P-Channel
- Advanced trench MOSFET process technology
- Ultra low on-resistance with low gate charge

$V_{DS}$	-12	V
$R_{DS(on),TYP@ V_{GS}=-4.5V}$	13	m $\Omega$
$R_{DS(on),TYP@ V_{GS}=-2.5V}$	19	m $\Omega$
$I_D$	-13	A

### DFN2x2-6L



Part ID	Package Type	Marking	Packing
ZT12P20	DFN2x2-6L	12P20	3000pcs/reel

### Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit
<b>Common Ratings (<math>T_C=25^\circ\text{C}</math> Unless Otherwise Noted)</b>			
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-12	V
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_{DM}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	$T_C = 25^\circ\text{C}$ -46	A
<b>Mounted on Large Heat Sink</b>			
$I_D$	Drain Current-Continuous	$T_C = 25^\circ\text{C}$ -13	A
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	18
		$T_C = 100^\circ\text{C}$	2.5
$R_{\theta JC}$	Thermal Resistance-Junction to Case (Note 2)	6.9	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	50	$^\circ\text{C}/\text{W}$

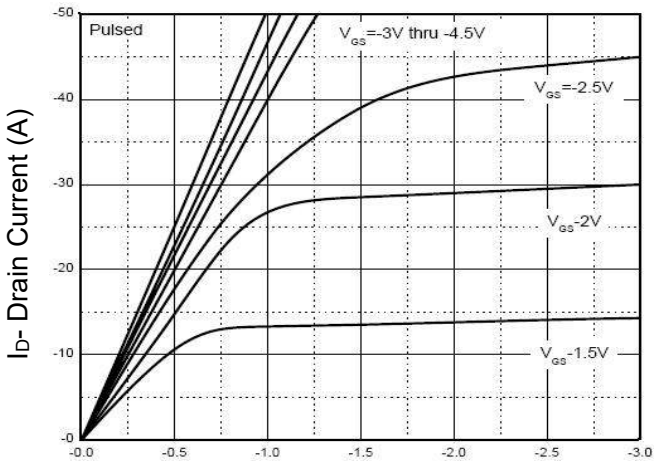
**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub>=25°C (unless otherwise stated)</b>						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-12	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-12V, V <sub>GS</sub> =0V	--	--	-1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.5	-0.7	-1.0	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance (Note 3)	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A	--	13	18	mΩ
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4A	--	19	26	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-6.7A	20	--	--	S
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated) (Note 4)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	--	1448	--	pF
C <sub>oss</sub>	Output Capacitance		--	323	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	282	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-10V, I <sub>D</sub> =-5A, V <sub>GS</sub> =-4.5V	--	15	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	3.4	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	4.1	--	nC
<b>Switching Characteristics (Note 4)</b>						
T <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =-10V, I <sub>D</sub> =-1A, R <sub>G</sub> =3Ω, V <sub>GS</sub> =-4.5V	--	16	--	ns
T <sub>r</sub>	Turn-on Rise Time		--	64	--	ns
T <sub>d(off)</sub>	Turn-Off Delay Time		--	71	--	ns
T <sub>f</sub>	Turn-Off Fall Time		--	62	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
I <sub>SD</sub>	Source-Drain Current (Body Diode)		--	--	-13	A
V <sub>SD</sub>	Forward on voltage (Note 4)	I <sub>S</sub> =-8A, V <sub>GS</sub> =0V	--	--	-1.2	V

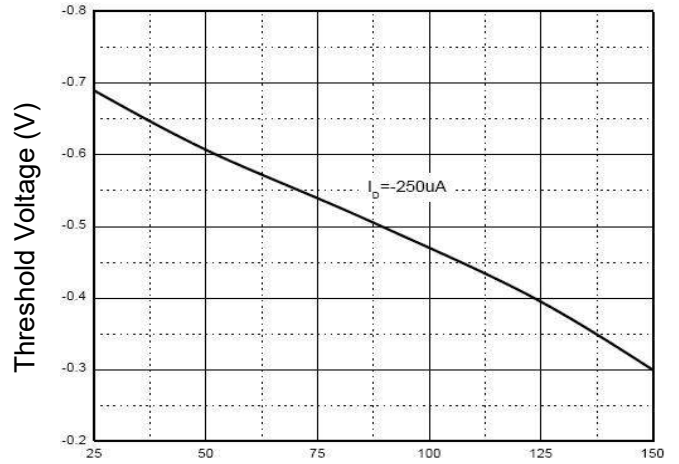
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

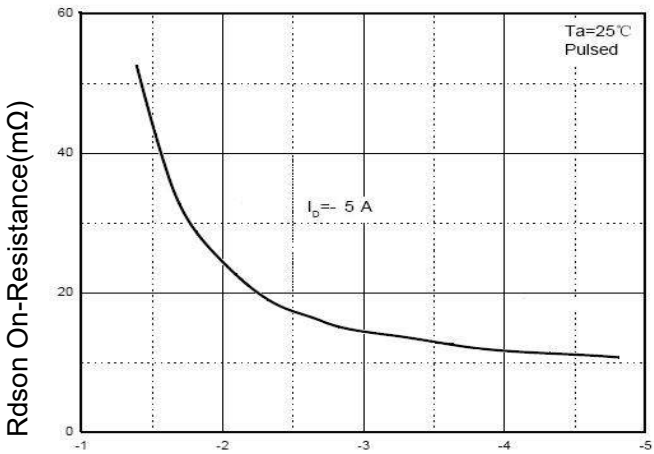
## Electrical Characteristics Diagrams



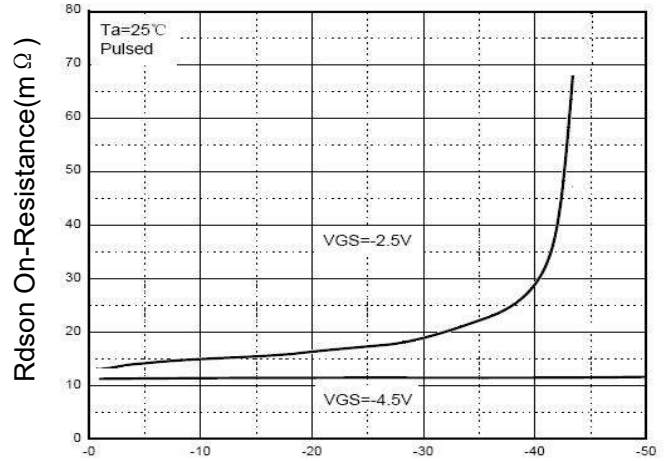
$V_{DS}$  Drain-Source Voltage (V)  
**Figure 1 Output Characteristics**



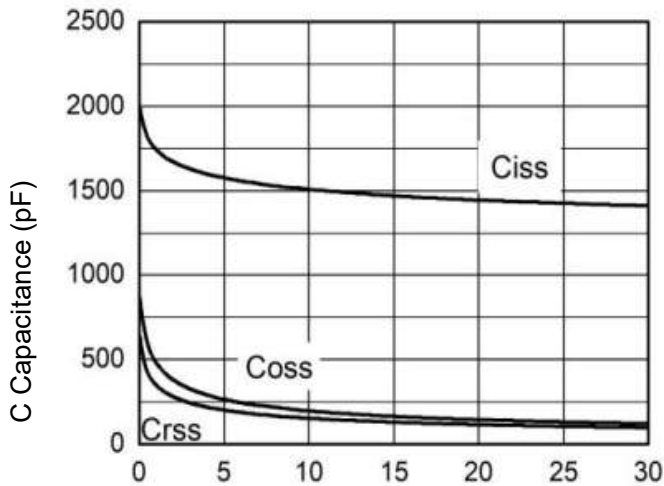
$T_J$ -Junction Temperature( $^{\circ}C$ )  
**Figure 2 Drain Current**



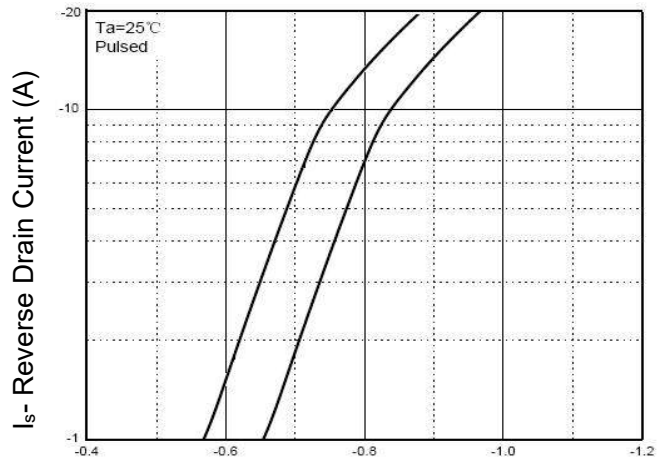
$V_{GS}$  Gate-Source Voltage (V)  
**Figure 3  $R_{DS(on)}$  vs  $V_{GS}$**



$I_D$ - Drain Current (A)  
**Figure 4 Drain-Source On-Resistance**



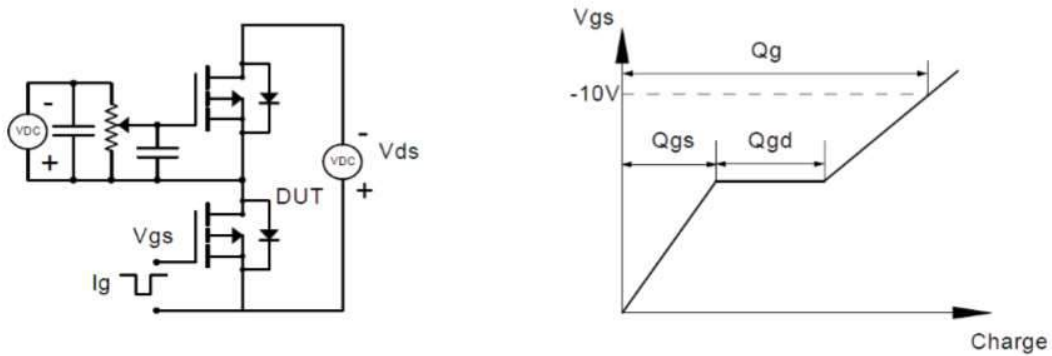
$V_{DS}$  Drain-Source Voltage (V)  
**Figure 5 Capacitance vs  $V_{DS}$**



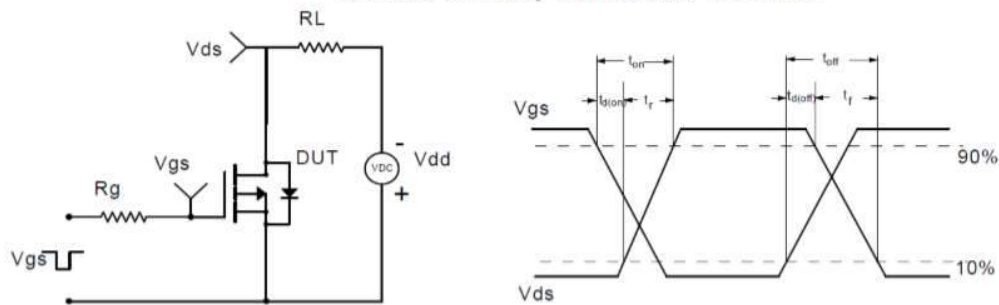
$V_{SD}$  Source-Drain Voltage (V)  
**Figure 6 Source- Drain Diode Forward**

## Test Circuit

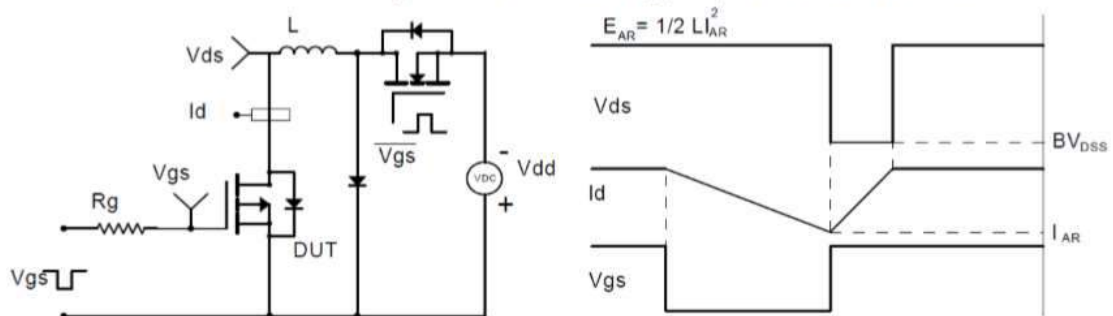
Gate Charge Test Circuit & Waveform



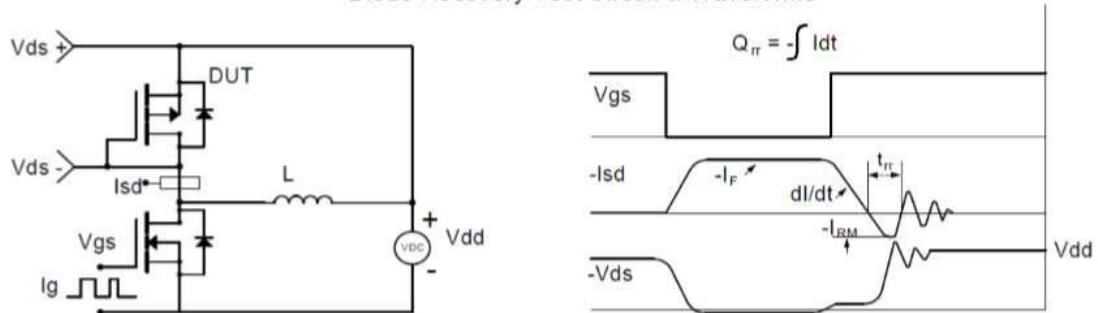
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

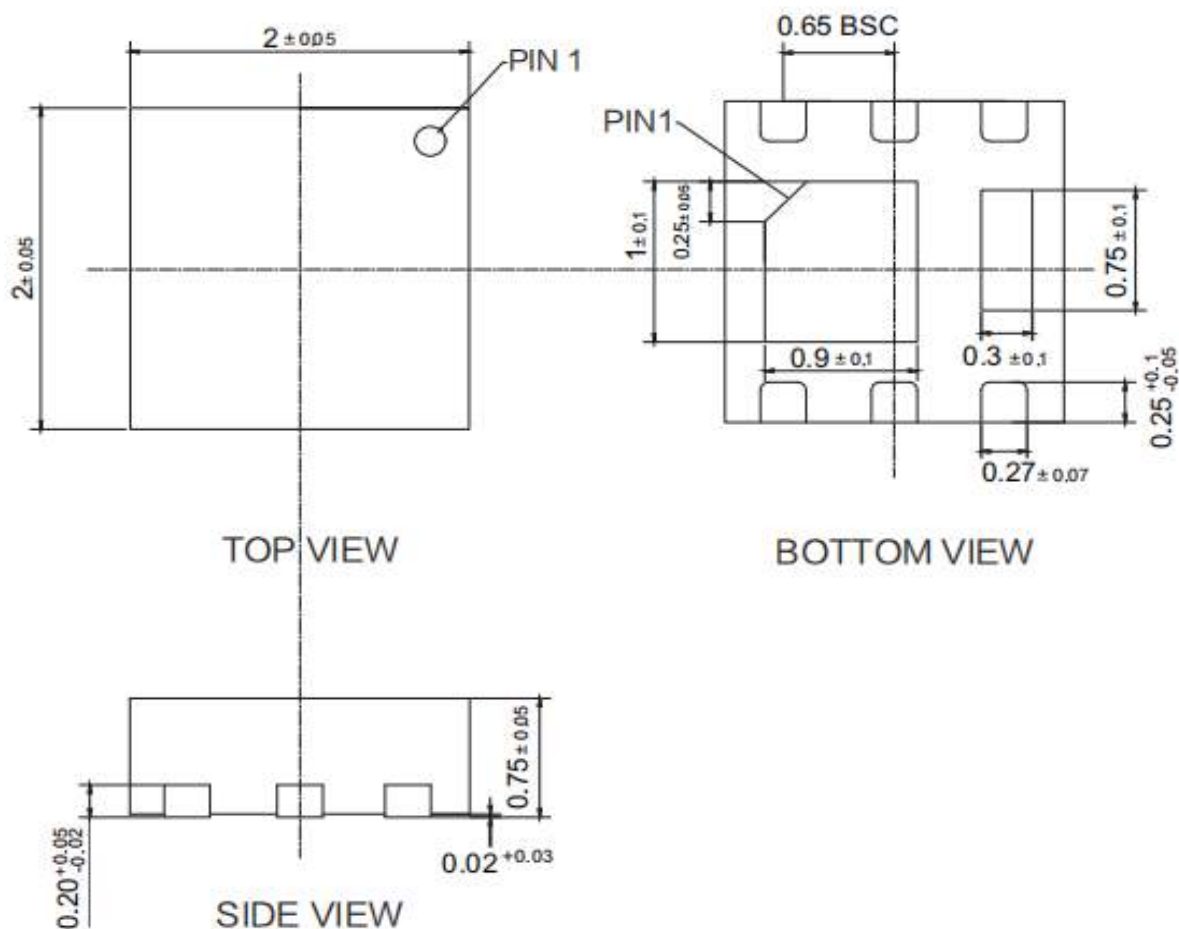


Diode Recovery Test Circuit & Waveforms



## DFN2x2-6L Package Information

Dimensions in mm



## Customer Service

Sales and Service:

[zj@ztasemi.com](mailto:zj@ztasemi.com)