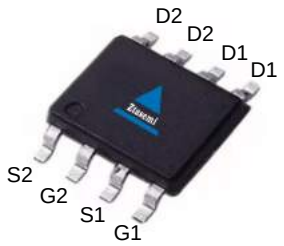
Features

- N and P-Channel
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

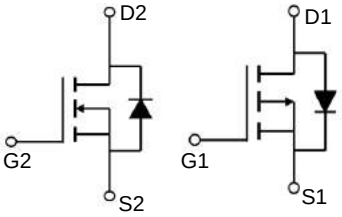
V_{DS}	30	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	18	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5V	22	mΩ
I_D	7	A

SOP-8



RoHS HF

Part ID	Package Type	Marking	Packing
ZT4606	SOP-8	ZT4606	4000pcs/reel



Absolute Maximum Ratings T_A =25°C, unless otherwise specified

Symbol	Parameter		N-Ch	P-Ch	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)					
V_{GS}	Gate-Source Voltage		±20	±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		30	-30	V
T_J	Maximum Junction Temperature		150	150	°C
T_{STG}	Storage Temperature Range		-55 to 150	-55 to 150	°C
I_{DM}	Drain Current-Continuous@ Current-Pulsed (Note 1)	T_C =25°C	28	-28	A
Mounted on Large Heat Sink					
I_D	Drain Current-Continuous	T_C =25°C	7	-7	A
		T_C =100°C	5.8	-5.8	A
P_D	Maximum Power Dissipation	T_C =25°C	2	2	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient (Note 2)		62.5	62.5	°C/W

Electrical Characteristics (T_J=25℃ unless otherwise noted) N channel

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.5	3.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=7A	--	18	22	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{DS}=4.5V,I_D=4A	--	22	27	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated) (Note 4)						
Ciss	Input Capacitance	V_{DS}=15V,V_{GS}=0V, f=1MHz	--	592	--	pF
Coss	OutputCapacitance		--	130	--	pF
Crss	ReverseTransferCapacitance		--	91	--	pF
Qg	Total Gate Charge	V_{DS}=15V,I_D=6A, V_{GS}=10V	--	11	--	nC
Qgs	Gate-SourceCharge		--	4.5	--	nC
Qgd	Gate-DrainCharge		--	3.6	--	nC
Switching Characteristics (Note 4)						
Td(on)	Turn-on Delay Time	V_{DD}=15V, R_L=2.5Ω, R_G=3.0Ω, V_{GS}=10V	--	4	--	ns
Tr	Turn-on Rise Time		--	8	--	ns
Td(off)	Turn-Off Delay Time		--	31	--	ns
Tf	Turn-Off Fall Time		--	4	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_{SD}	Source-Drain Current (Body Diode)		--	--	7	A
V_{SD}	Forward on voltage (Note 3)	I_S=7.0A,V_{GS} =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

N- Channel Typical Electrical and Thermal Characteristics (Curves)

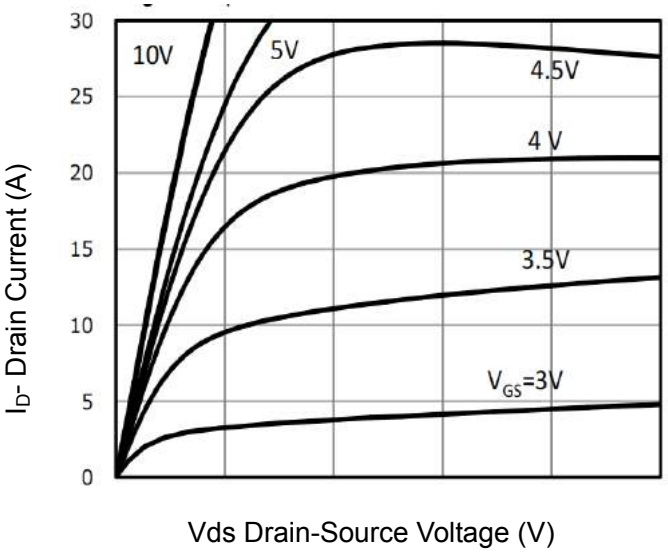


Figure 1 Output Characteristics

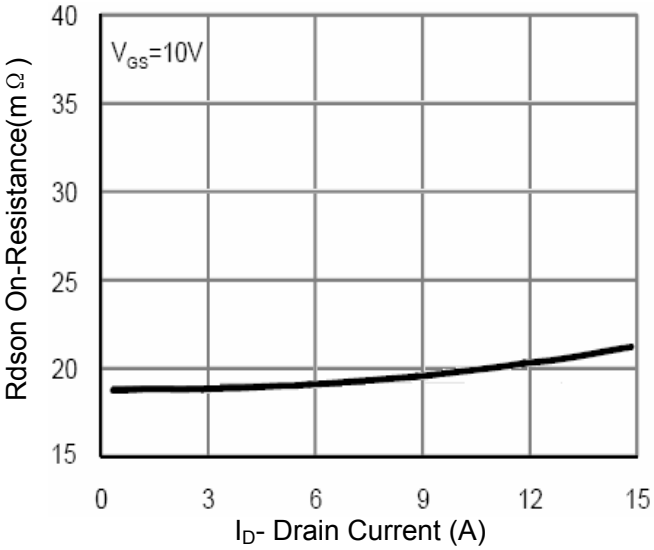


Figure 4 Drain-Source On-Resistance

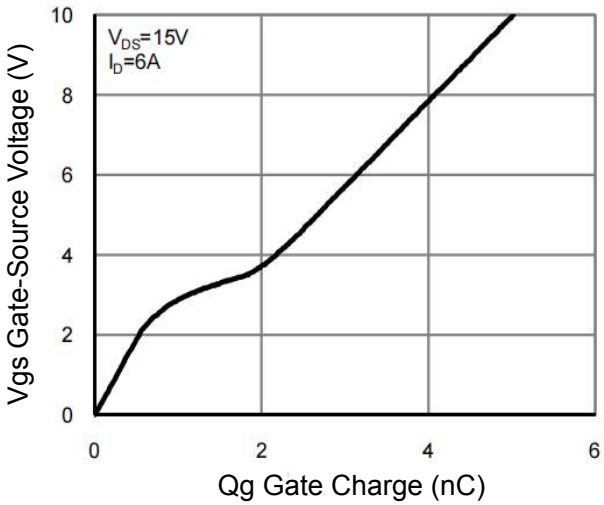


Figure 2 Gate Charge

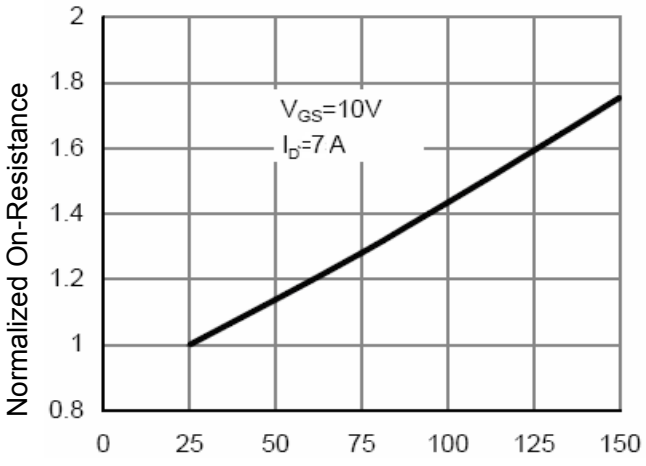


Figure 5 Drain-Source On-Resistance

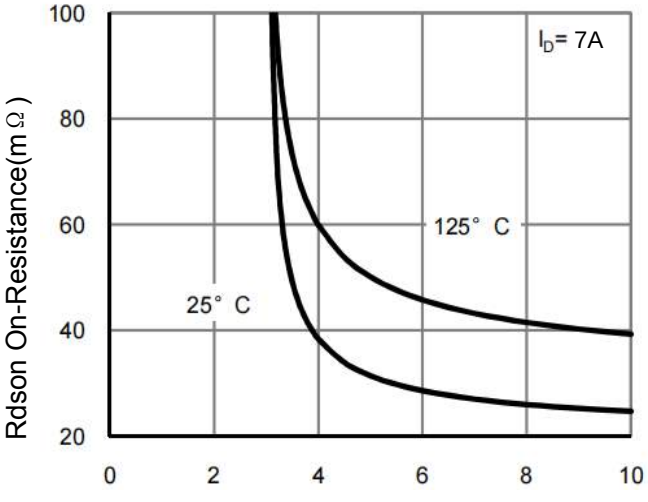


Figure3 Rdson vs Vgs

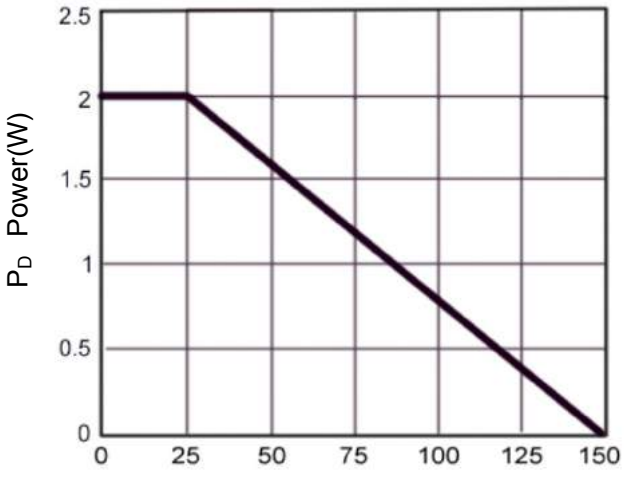


Figure 6 Power Dissipation

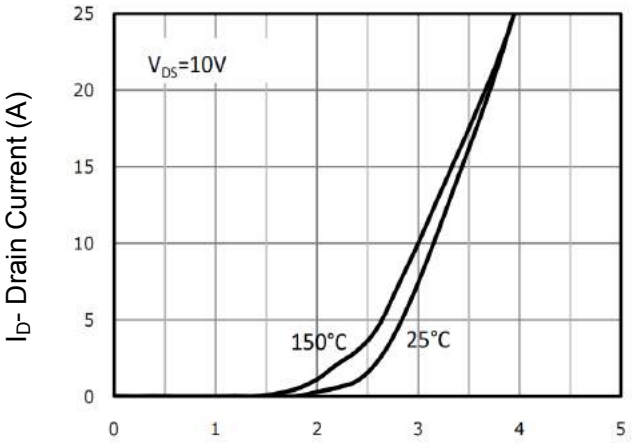


Figure 7 Transfer Characteristics

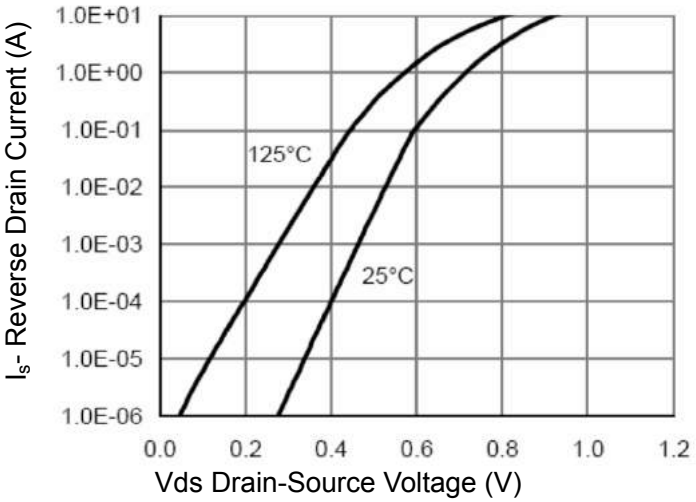


Figure 9 Source- Drain Diode Forward

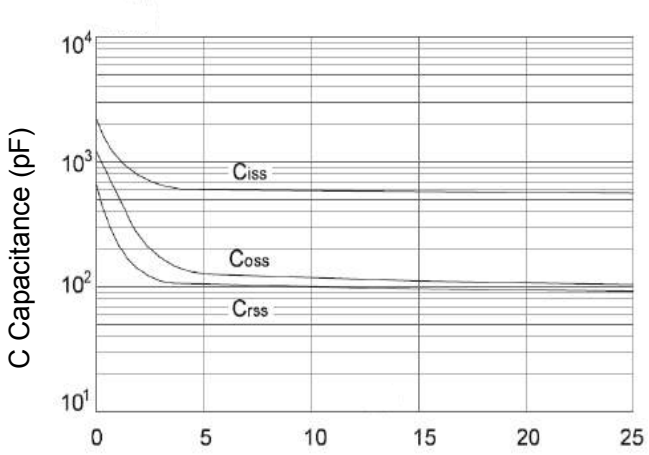


Figure 8 Capacitance vs Vds

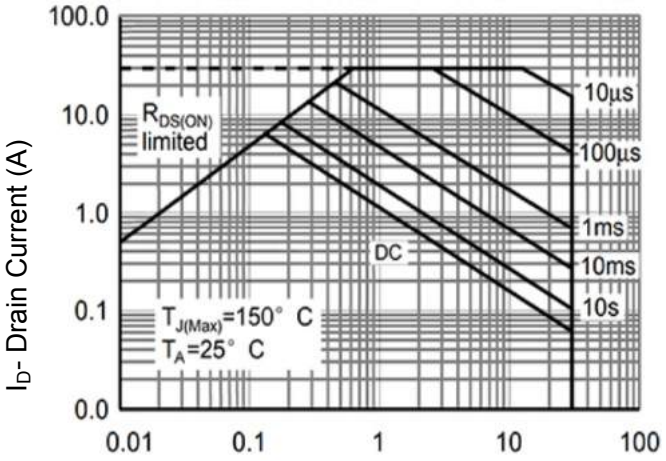


Figure 10 Safe Operation Area

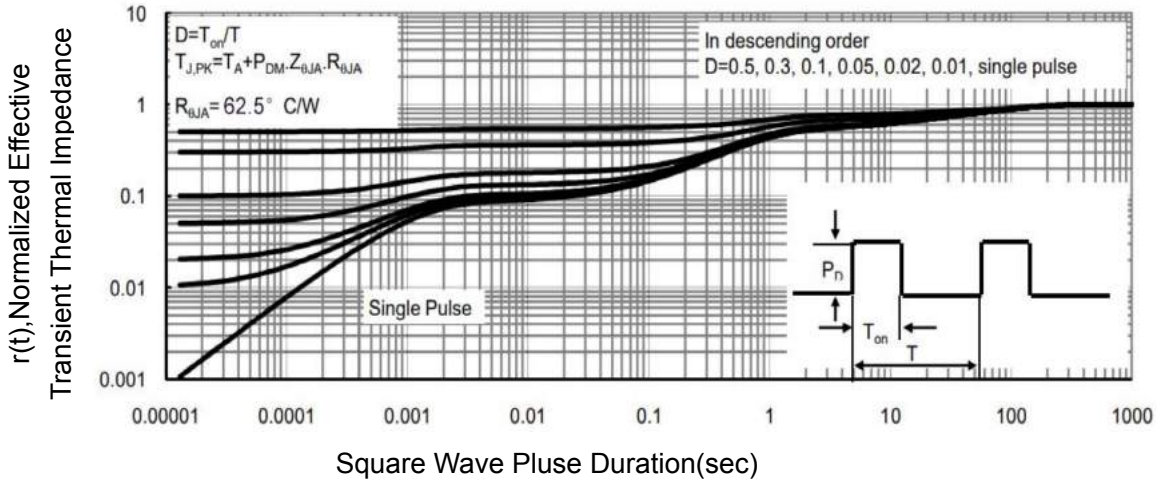
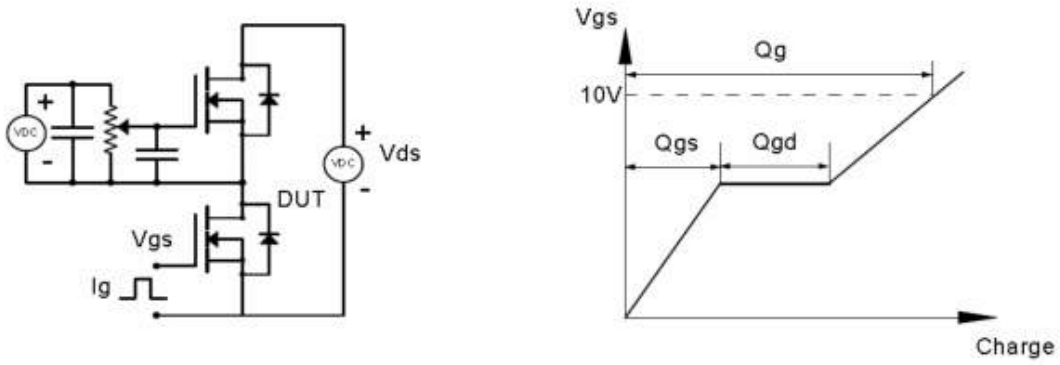


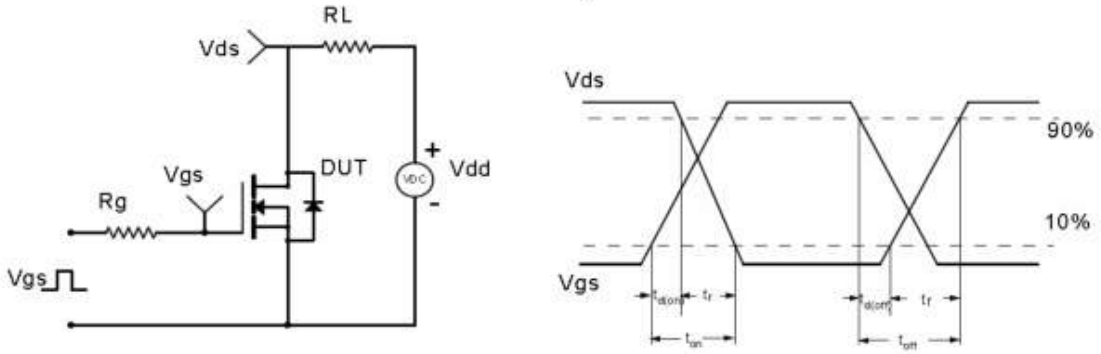
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

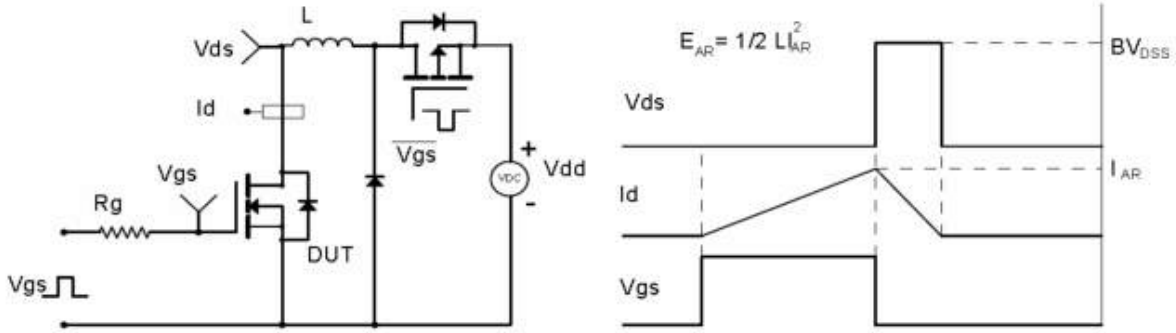
Gate Charge Test Circuit & Waveform



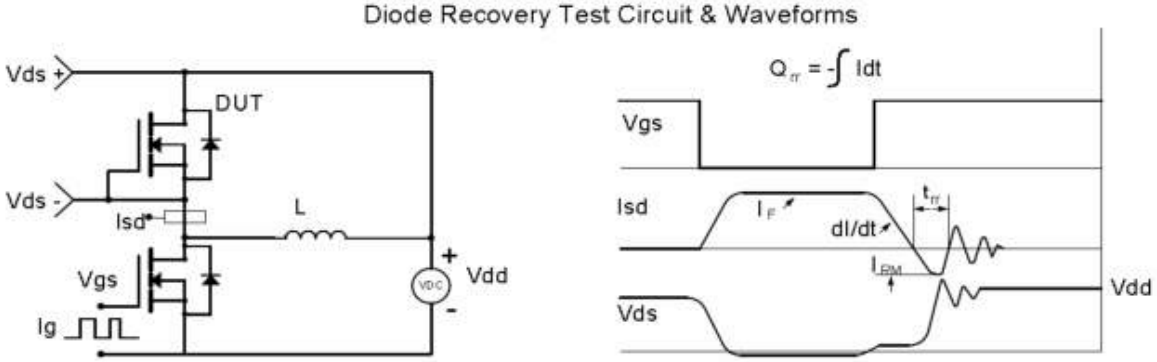
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Electrical Characteristics (T_J=25℃ unless otherwise noted) P channel

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V	--	--	-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1.1	-1.6	-2.2	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V,I_D=-7A	--	25	32	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{DS}=-4.5V,I_D=-4A	--	32	40	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated) (Note 4)						
Ciss	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1MHz	--	933	--	pF
Coss	OutputCapacitance		--	126	--	pF
Crss	ReverseTransferCapacitance		--	103	--	pF
Qg	Total Gate Charge	V_{DS}=-15V,I_D=-6.5A, V_{GS}=-10V	--	14	--	nC
Qgs	Gate-SourceCharge		--	3.3	--	nC
Qgd	Gate-DrainCharge		--	3.2	--	nC
Switching Characteristics (Note 4)						
Td(on)	Turn-on Delay Time	V_{DD}=-15V, R_L=2.3Ω, R_G=6.0Ω, V_{GS}=-10V	--	7.2	--	ns
Tr	Turn-on Rise Time		--	3.8	--	ns
Td(off)	Turn-Off Delay Time		--	2.6	--	ns
Tf	Turn-Off Fall Time		--	3.2	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_{SD}	Source-Drain Current (Body Diode)		--	--	-7	A
V_{SD}	Forward on voltage (Note 3)	I_S=-7A,V_{GS}=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

P- Channel Typical Electrical and Thermal Characteristics (Curves)

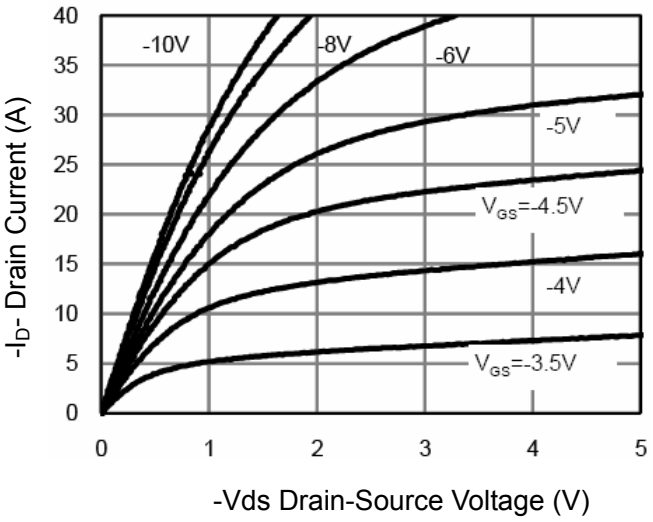


Figure 1 Output Characteristics

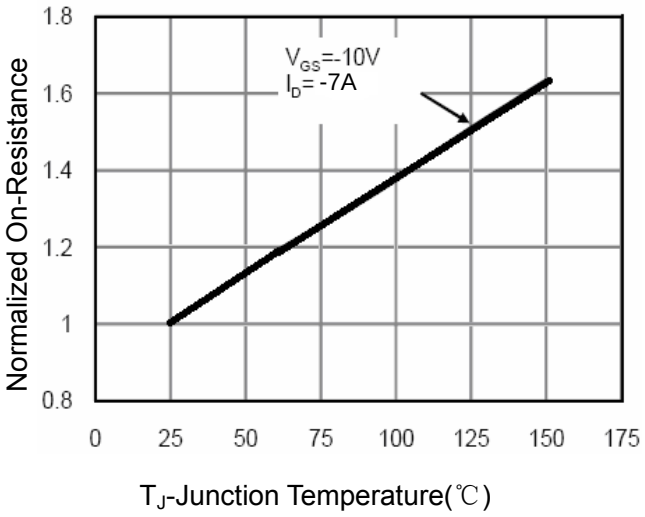


Figure 4 Rdson-Junction Temperature

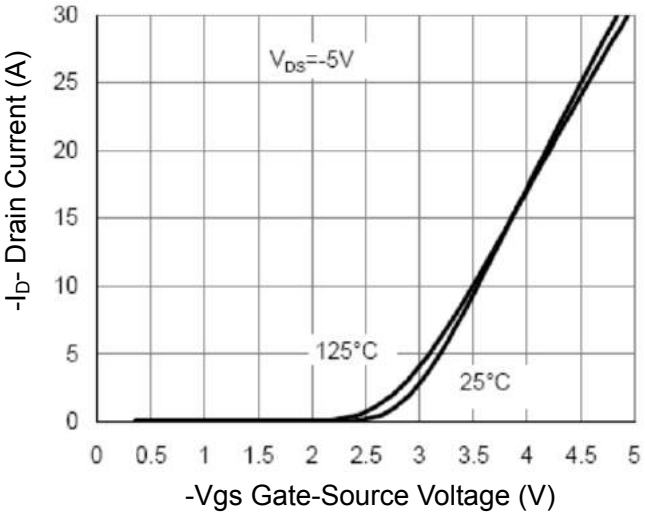


Figure 2 Transfer Characteristics

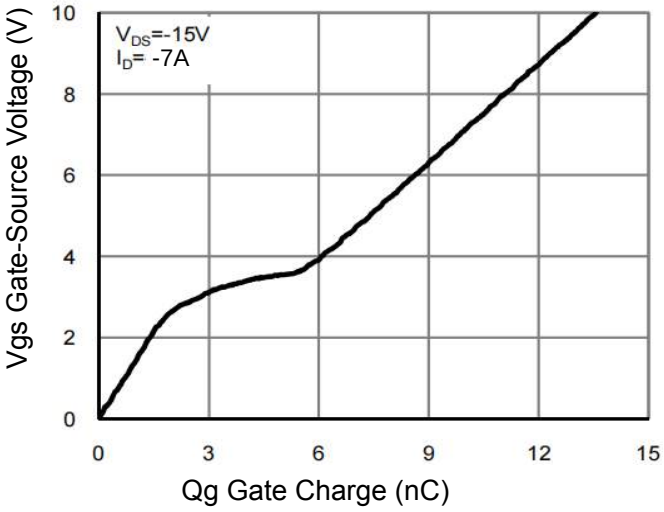


Figure 5 Gate Charge

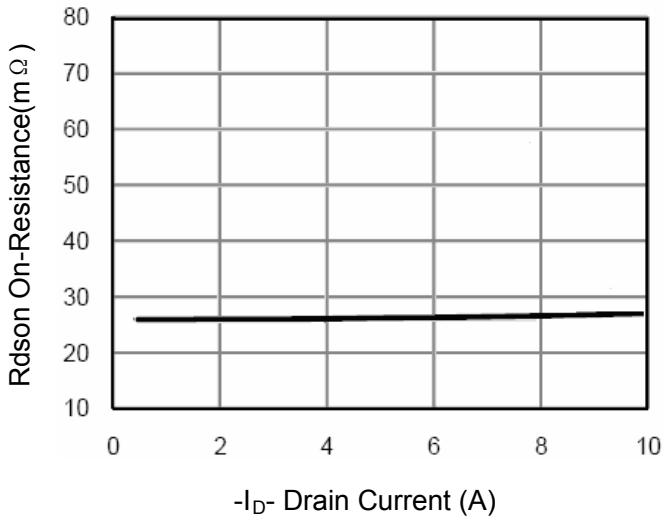


Figure 3 Rdson- Drain Current

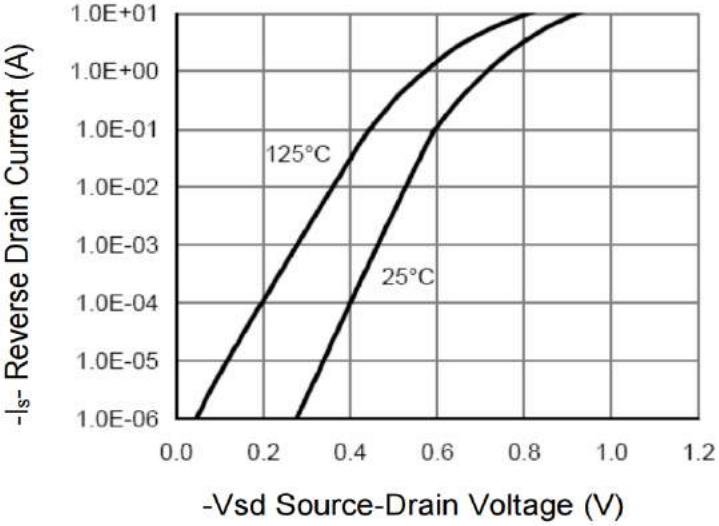


Figure 6 Source- Drain Diode Forward

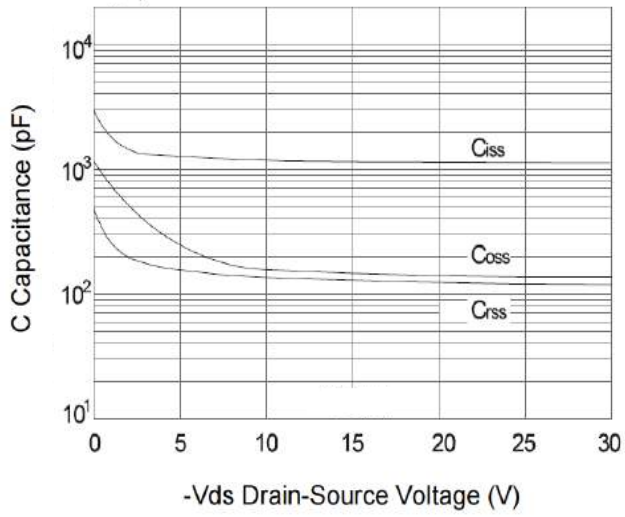
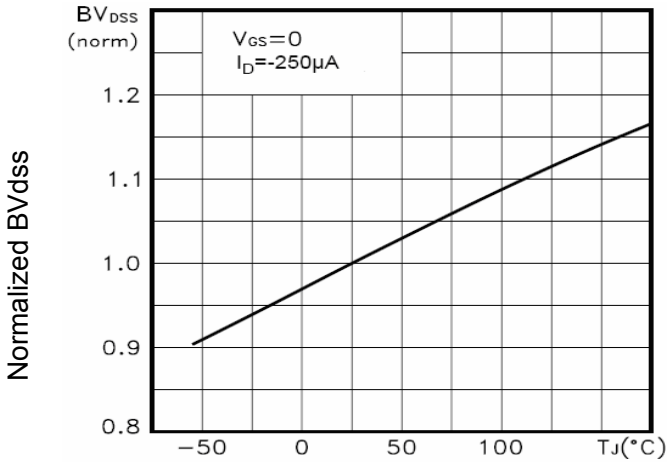


Figure 7 Capacitance vs Vds



TJ-Junction Temperature(℃)

Figure 9 BV_{DSS} vs Junction Temperature

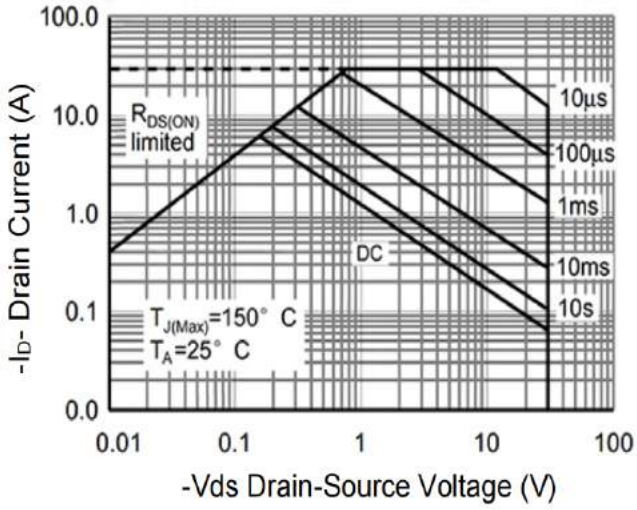
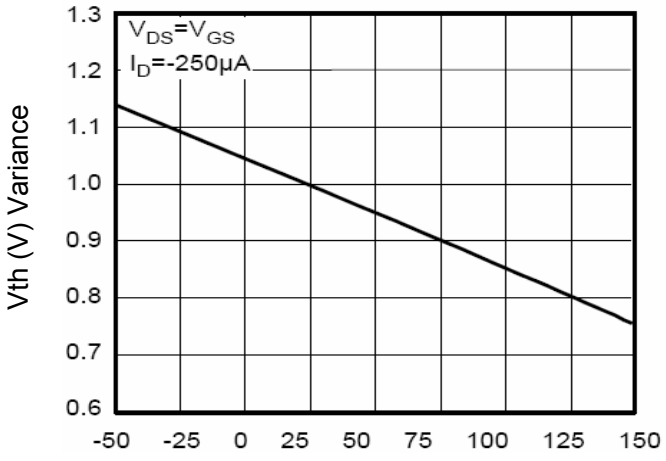
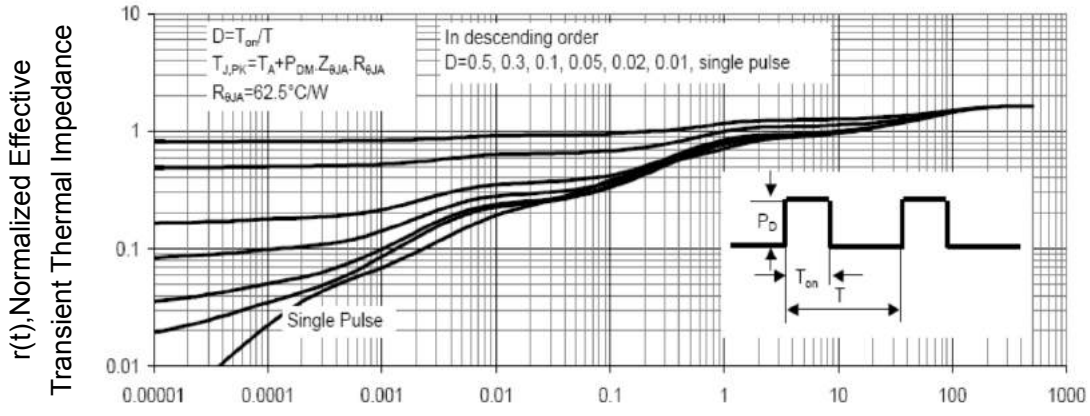


Figure 8 Safe Operation Area



TJ-Junction Temperature(℃)

Figure 10 $V_{GS(th)}$ vs Junction Temperature

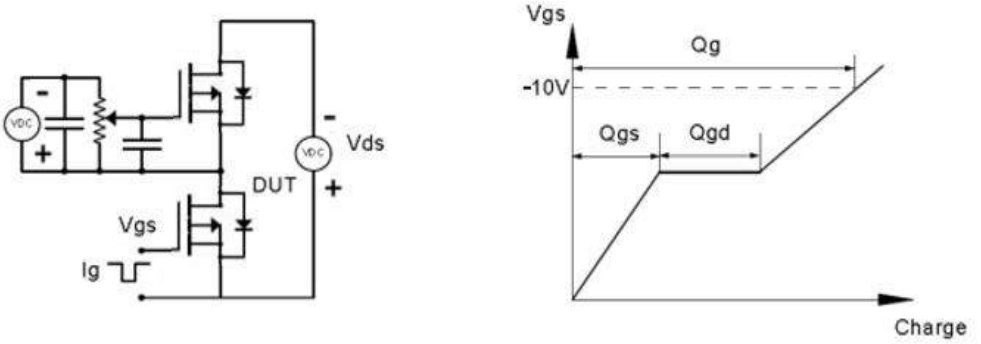


Square Wave Pluse Duration(sec)

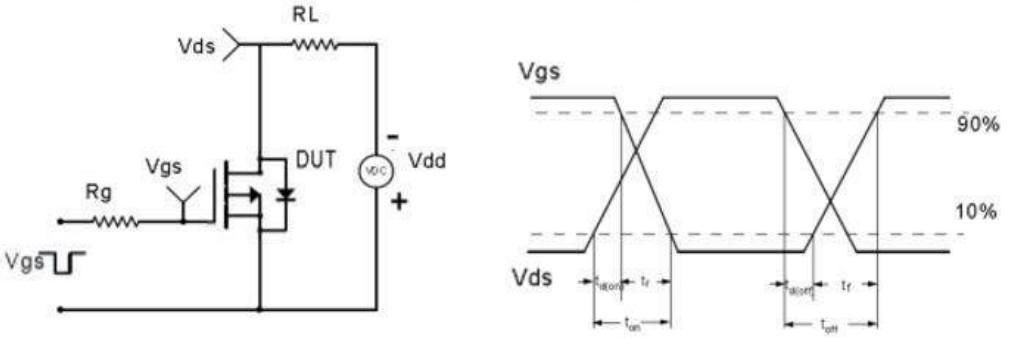
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit & Waveform

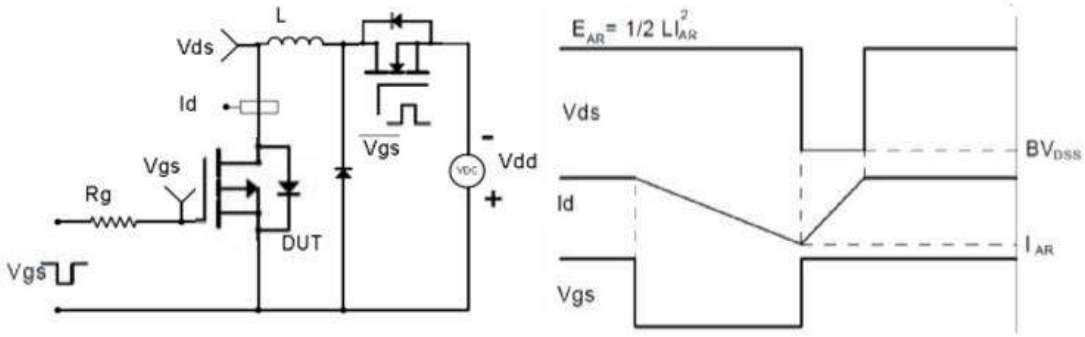
Gate Charge Test Circuit & Waveform



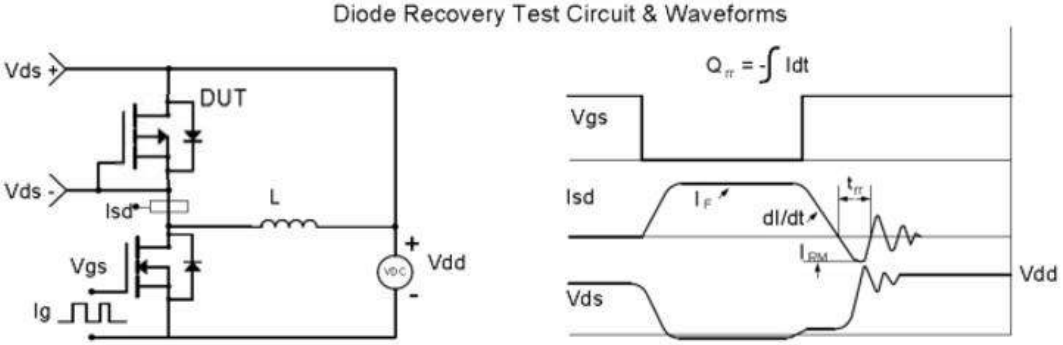
Resistive Switching Test Circuit & Waveforms



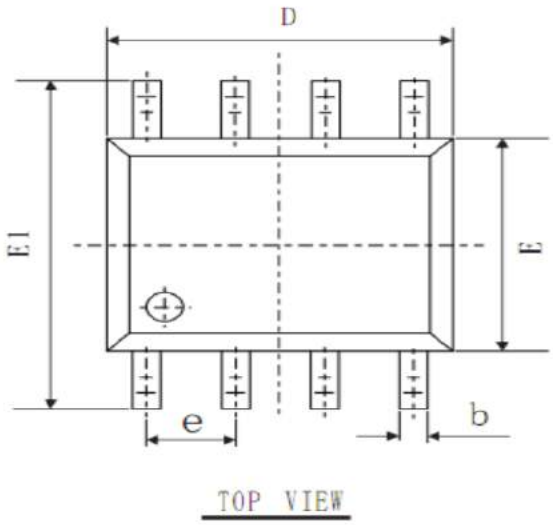
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



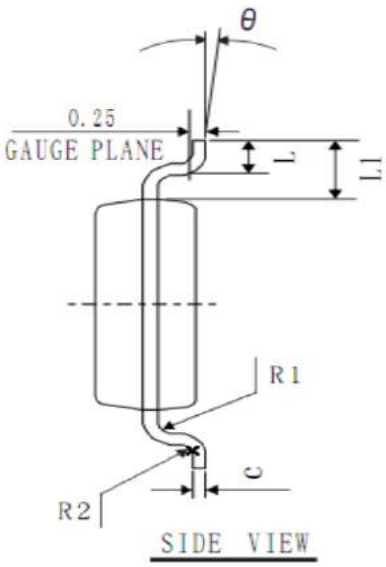
Diode Recovery Test Circuit & Waveforms



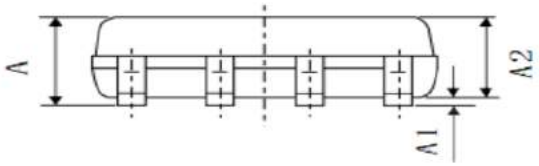
SOP-8 Package Information



TOP VIEW



SIDE VIEW



SIDE VIEW

COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
L	0.45	0.70	1.00
θ	2°	4°	6°
L1	1.04 REF		
e	1.27 BSC		
R1	0.07 TYP		
R2	0.07 TYP		

Customer Service

Sales and Service:

zj@ztasemi.com