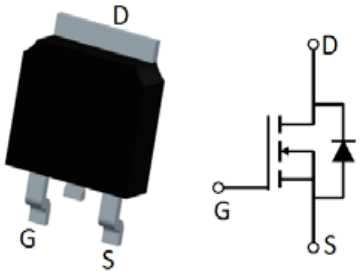
Features

- N-Channel，*Low $R_{DS(on)}$ @V_{GS}=10V*
- *5V Logic Level Control*
- *100% UIS Tested*
- *Pb−Free, RoHS Compliant*

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
20V	5.1mΩ @ 10V	60A
	5.6mΩ @ 7V	

Applications

- Primary Side Switch
- *Load Switch*
- *Optimized for Power Management Applications for Portable Products, such as H-bridge, Inverters Car Charger and Others*



Order Information

Product	Package	Marking	Packing	Min Unit Quantity
XW8020	TO-252	8020	2500PCS/Reel	2500PCS
XW8020A	TO-252	8020A	2500PCS/Reel	2500PCS

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating	Unit
Common Ratings (T_j=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±12	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		20	V
T_{STG} T_J	Storage and operating temperature range		-50 to 150	°C
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested①	T_C =25°C	240	A
I_S	Diode continuous forward current	T_C =25°C	60	A
I_D	Continuous Drain Current(V_{GS}=10V)	T_C =25°C	60	A
		T_C =70°C	48	
P_D	Maximum Power Dissipation	T_C =25°C	52	W
EAS	Avalanche energy, single pulsed ②		109	mJ
$R_{\theta JC}$	Thermal Resistance-Junction to Case		2.4	°C/W

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	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_C=25℃)	V_{DS}=20V, V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_C=125℃)	V_{DS}=16V, V_{GS}=0V	--	--	100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.6	0.8	1.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=30A	--	5.1	6	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=7V, I_D=30A	--	5.7	7.5	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=4.5V, I_D=20A	--	7.1	9	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	--	1335	--	pF
C_{oss}	Output Capacitance		--	210	--	pF
C_{rss}	Reverse Transfer Capacitance		--	140	--	pF
R_g	Gate Resistance	f=1MHz		11		Ω
Q_g	Total Gate Charge	V_{DS}=15V I_D=30A, V_{GS}=10V	--	23.5	--	nC
Q_{gs}	Gate Source Charge		--	3.3	--	nC
Q_{gd}	Gate Drain Charge		--	4.8	--	nC
Switching Characteristics @ T_J = 25°C (unless otherwise stated)						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=15V, I_D=15A, R_G=3.3Ω, V_{GS}=10V	--	11	--	ns
t_r	Turn on Rise Time		--	30	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	24	--	ns
t_f	Turn Off Fall Time		--	6	--	ns
Source Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage③	I_{SD}=20A,V_{GS}=0V	--	0.83	1.2	V

Notes: ① Pulse width limited by maximum allowable junction temperature

② Limited by TJmax, starting TJ = 25°C, L = 0.3mH,RG = 25Ω, IAS = 27A, VGS =10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

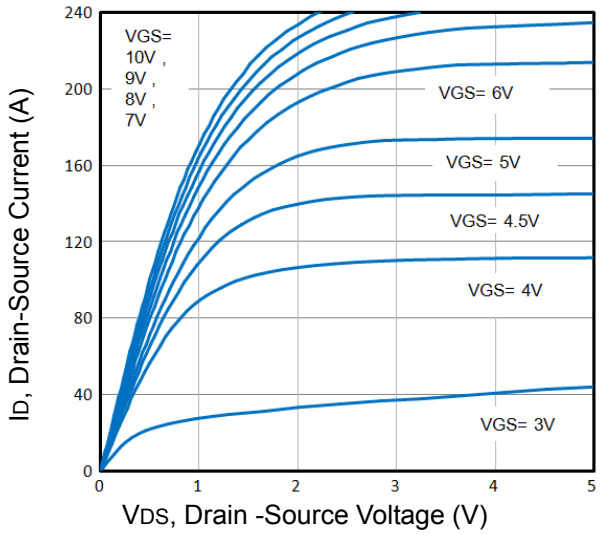


Fig1. Typical Output Characteristics

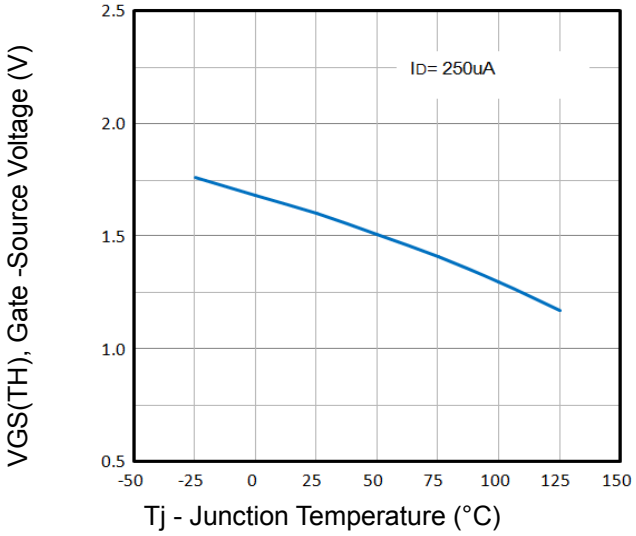


Fig2. VGS(TH) Voltage Vs. Temperature

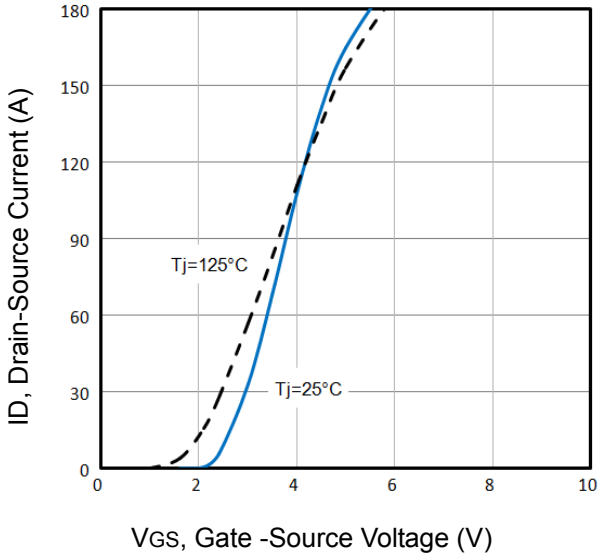


Fig3. Typical Transfer Characteristics

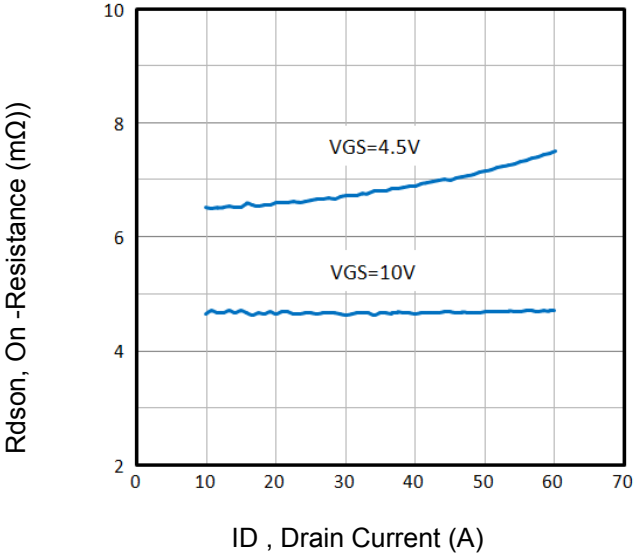


Fig4. On-Resistance vs. Drain Current and Gate Voltage

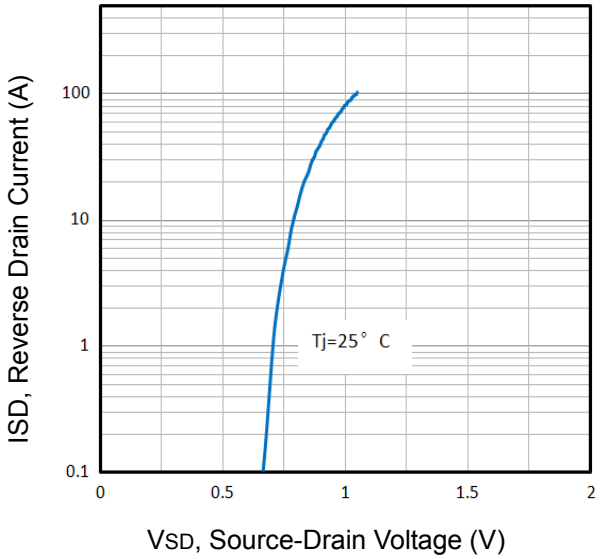


Fig5. Typical Source-Drain Diode Forward Voltage

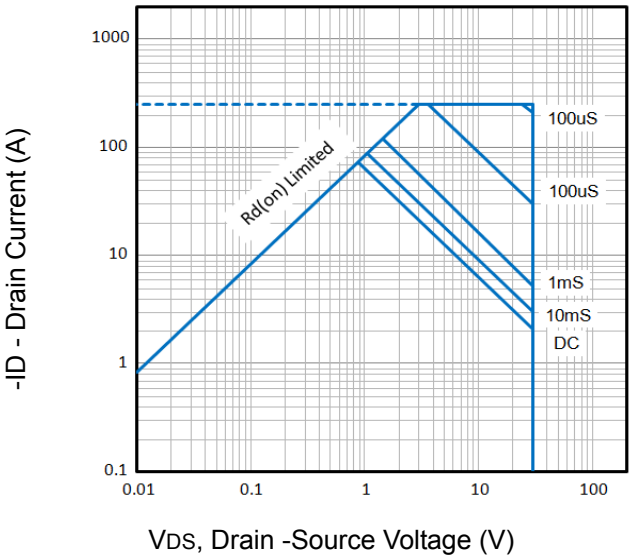


Fig6. Maximum Safe Operating Area

Typical Characteristics

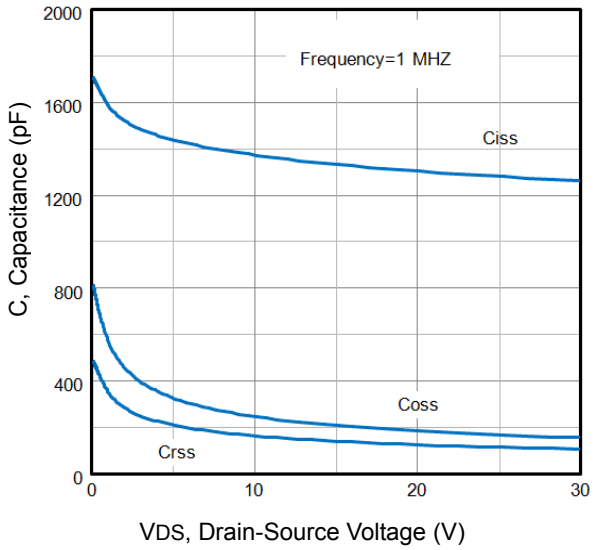


Fig7. Typical Capacitance Vs. Drain-Source Voltage

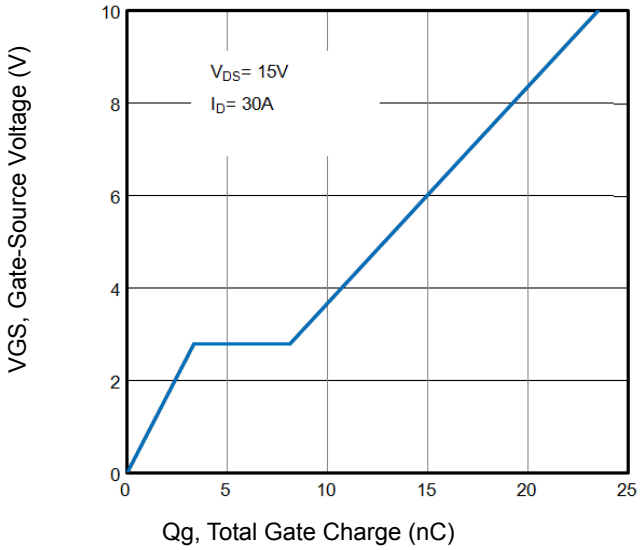


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

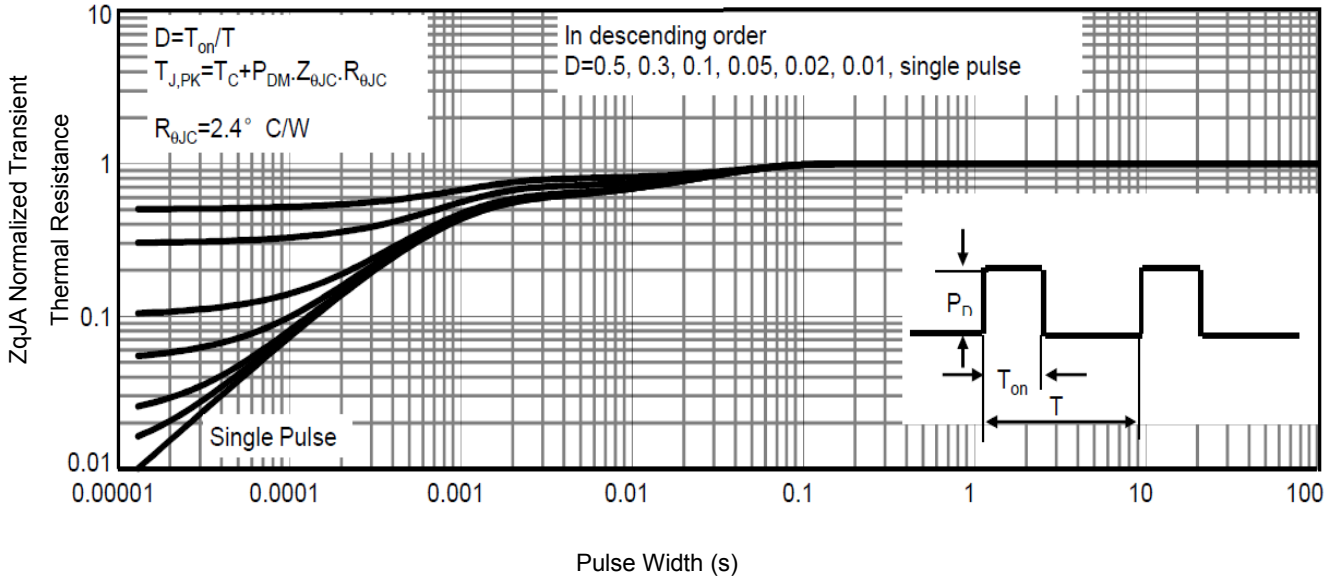


Fig9. Normalized Maximum Transient Thermal Impedance

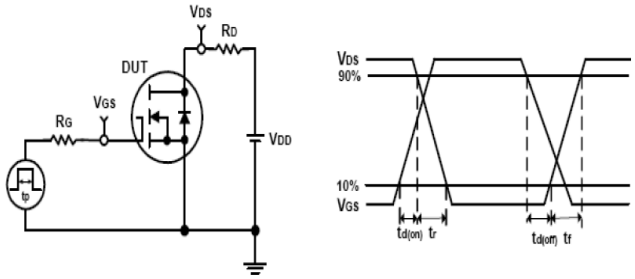


Fig10. Switching Time Test Circuit and waveforms

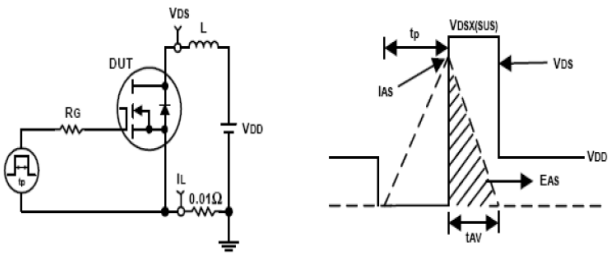
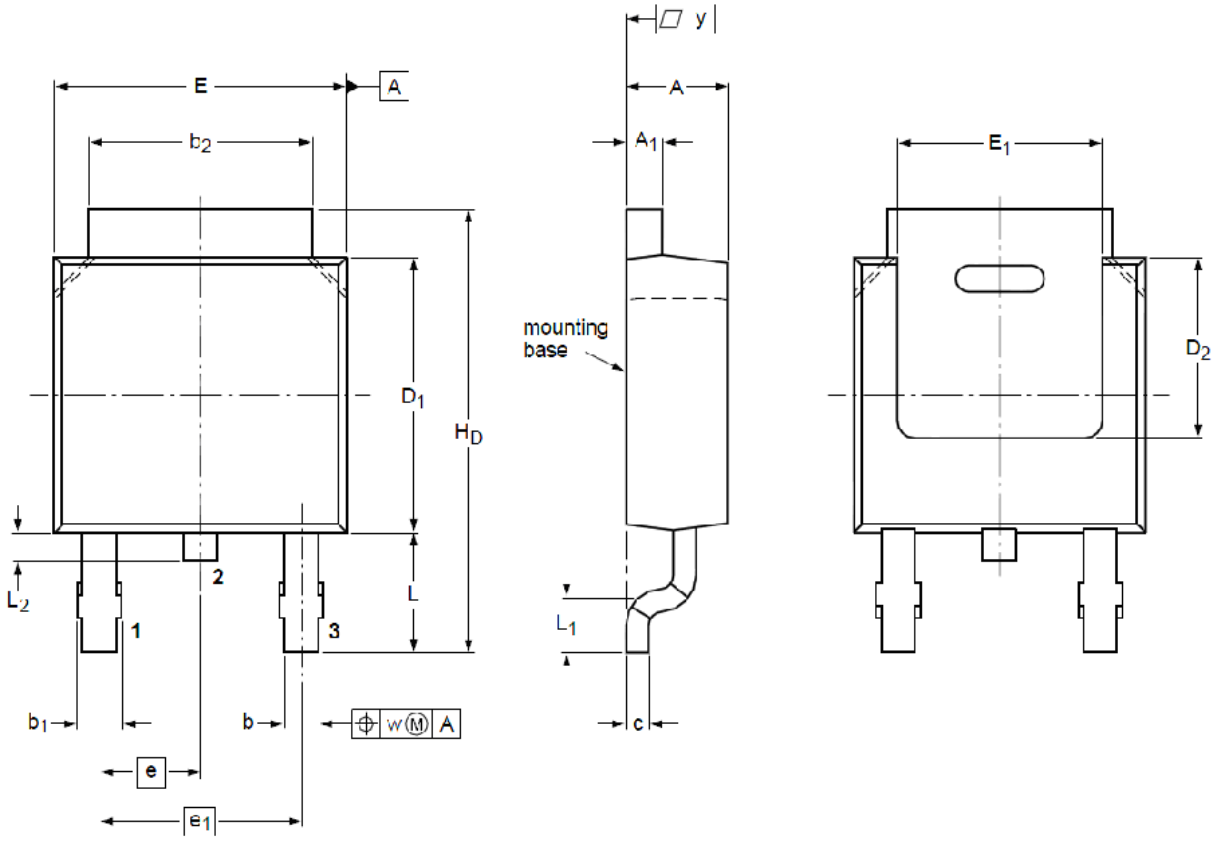


Fig11. Unclamped Inductive Test Circuit and waveforms

TO-252 Mechanical Data



Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.70	0.75	0.80	**b**	0.25	0.30	0.35
C	0.10	0.15	0.25	**D**	3.25	3.35	3.45
D1	3.00	3.10	3.20	**D2**	1.78	1.88	1.98
D3	--	0.13	--	**E**	3.20	3.30	3.40
E1	3.00	3.15	3.20	**E2**	2.39	2.49	2.59
e	0.65BSC			**H**	0.30	0.39	0.50
L	0.30	0.40	0.50	**L1**	--	0.13	--
θ	--	10°	12°	**M**	*	*	0.15