

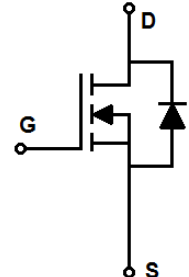
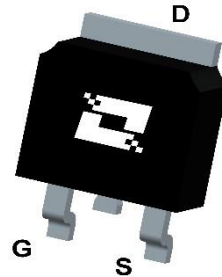
Features

- 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
30V	2.0m Ω @10V	140A
	3.0m Ω @4.5V	

Applications

- Load Switch
- Switching Circuits
- High Speed line Driver
- Power management


TO-252
Order Information

Product	Package	Marking	Packing
DWD160N03	TO-252	160N03	2500PCS/Reel

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 _A =25°C Unless Otherwise Noted)				
V _{GS}	Gate-Source Voltage		±20	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		30	V
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-50 to 150	°C
Mounted on Large Heat Sink				
I _{DM}	Pulse Drain Current Tested①	T _A =25°C	250	A
I _D	Continuous Drain Current	T _A =25°C	140	A
		T _A =70°C	112	
P _D	Maximum Power Dissipation	T _A =25°C	83	W
EAS	Avalanche energy, single pulsed ②		595.35	mJ
R _{θJC}	Thermal Resistance Junction-Ambient		1.5	°C/W

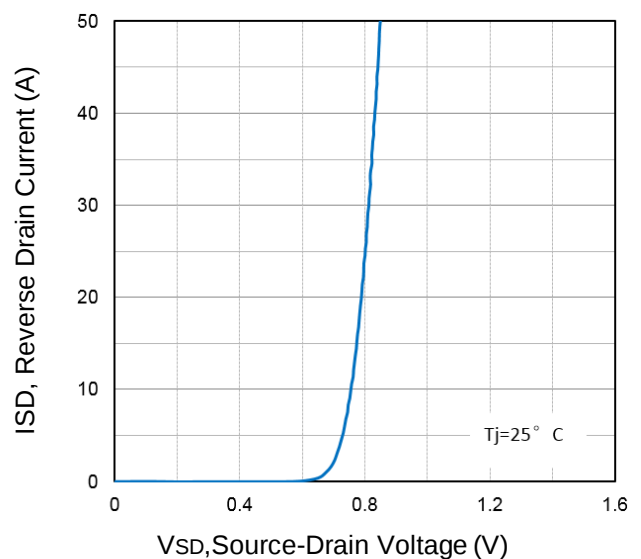
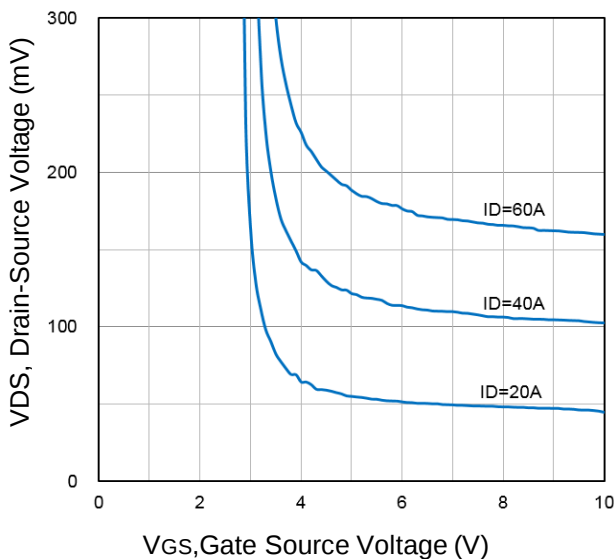
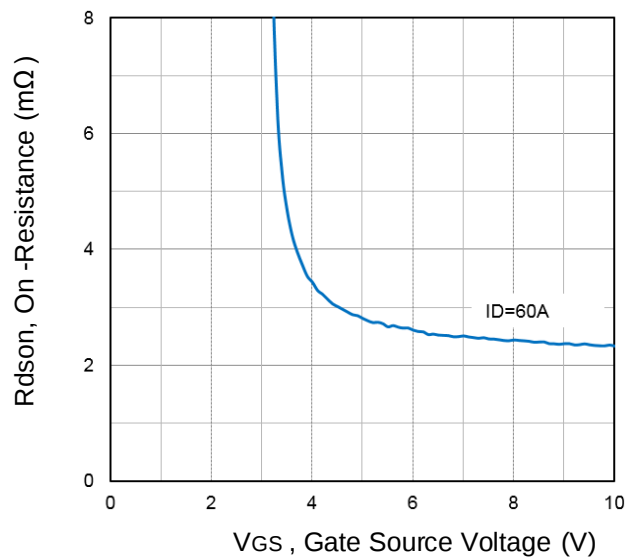
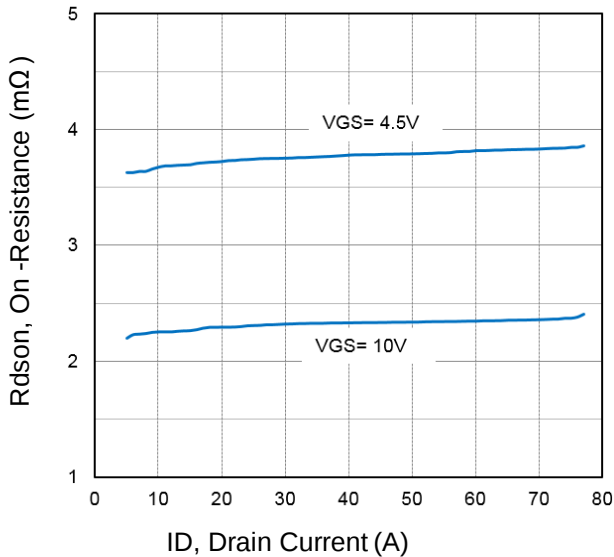
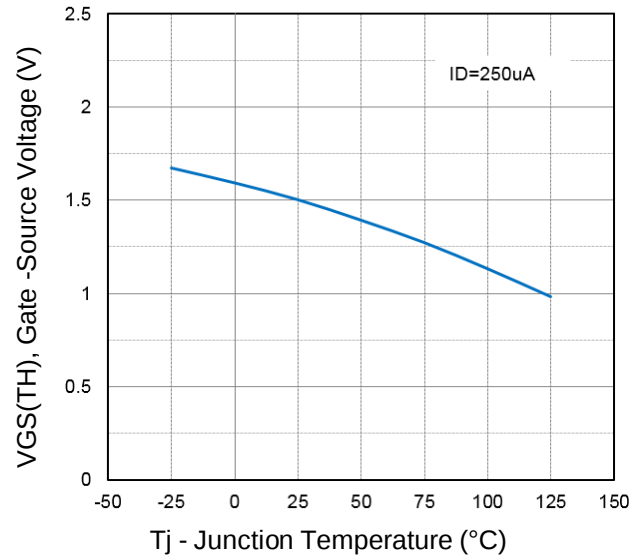
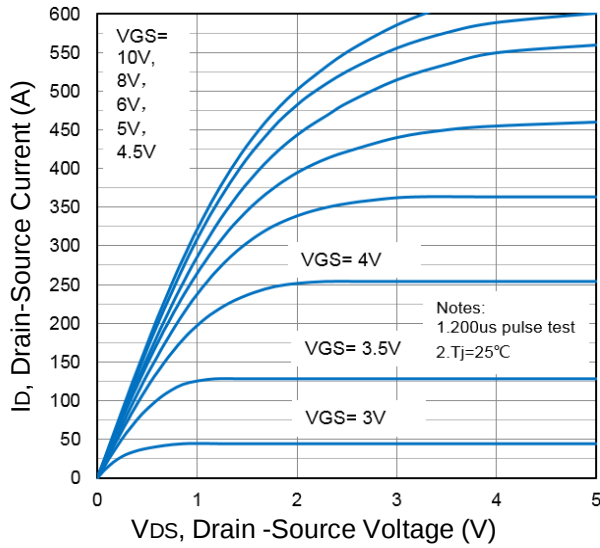
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	30	–	–	V
I _{DSS}	Zero Gate Voltage Drain Current(T _A =25°C)	V _{DS} =30V, V _{GS} =0V	–	–	1	μA
	Zero Gate Voltage Drain Current(T _A =125°C)	V _{DS} =24V, V _{GS} =0V	–	–	100	nA
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	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =10, I _D =40A	–	2.0	2.5	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =4.5V, I _D =20A	–	3.0	3.8	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	–	4689	–	pF
C _{oss}	Output Capacitance		–	551	–	pF
C _{rss}	Reverse Transfer Capacitance		–	513	–	pF
R _g	Gate Resistance	f=1MHz		1.8		Ω
Q _g	Total Gate Charge	V _{DS} =20V I _D =40A, V _{GS} =10V	–	105	–	nC
Q _{gs}	Gate Source Charge		–	14.3	–	nC
Q _{gd}	Gate Drain Charge		–	24.9	–	nC
Switching Characteristics						
t _{d(on)}	Turn on Delay Time	V _{DD} =15V, I _D =1A, R _G =6Ω, V _{GS} =10V	–	14.6	–	ns
t _r	Turn on Rise Time		–	32.8	–	ns
t _{d(off)}	Turn Off Delay Time		-	62.2	–	ns
t _f	Turn Off Fall Time		–	28.4	–	ns
Source Drain Diode Characteristics						
I _{SD}	Source drain current(Body Diode)	T _A =25°C	–	–	160	A
V _{SD}	Forward on voltage②	T _J =25°C, I _{SD} =10A, V _{GS} =0V	–	–	1.2	V

Notes: ① Pulse width limited by maximum allowable junction temperature

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.3mH, R_G = 25Ω, I_{AS}=63A, V_{GS} =10V. Part not recommended for use above this value

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

Typical Characteristics



Typical Characteristics

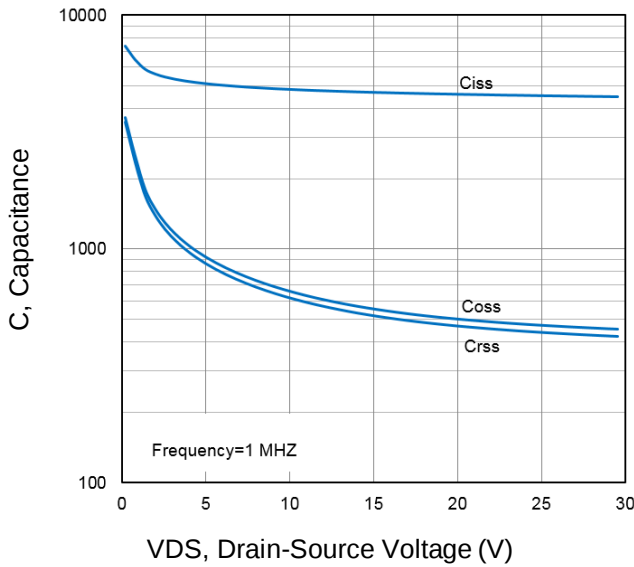


Fig7. Typical Capacitance Vs. Drain-Source Voltage

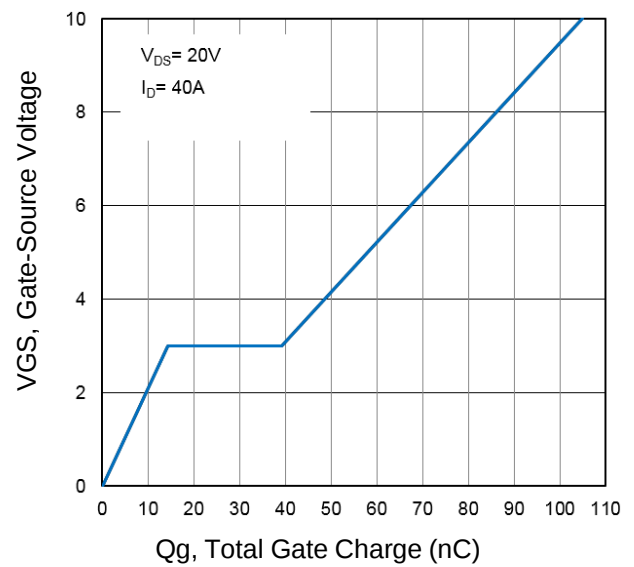


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

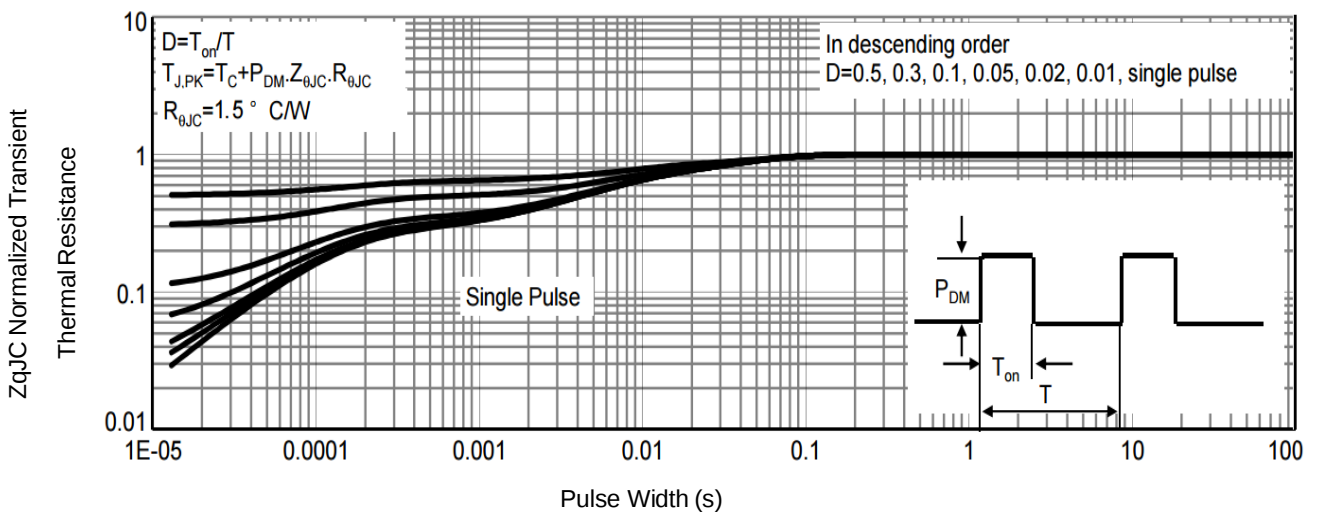


Fig7. Normalized Maximum Transient Thermal Impedance

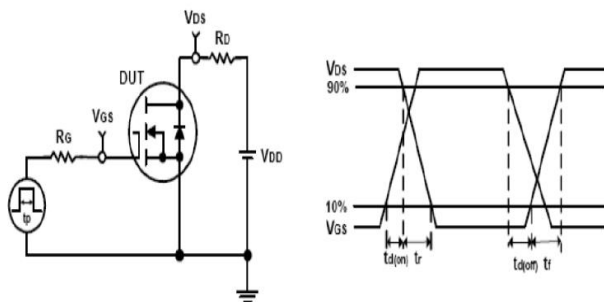


Fig10. Switching Time Test Circuit and waveforms

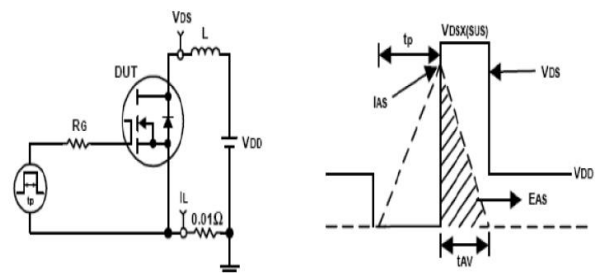
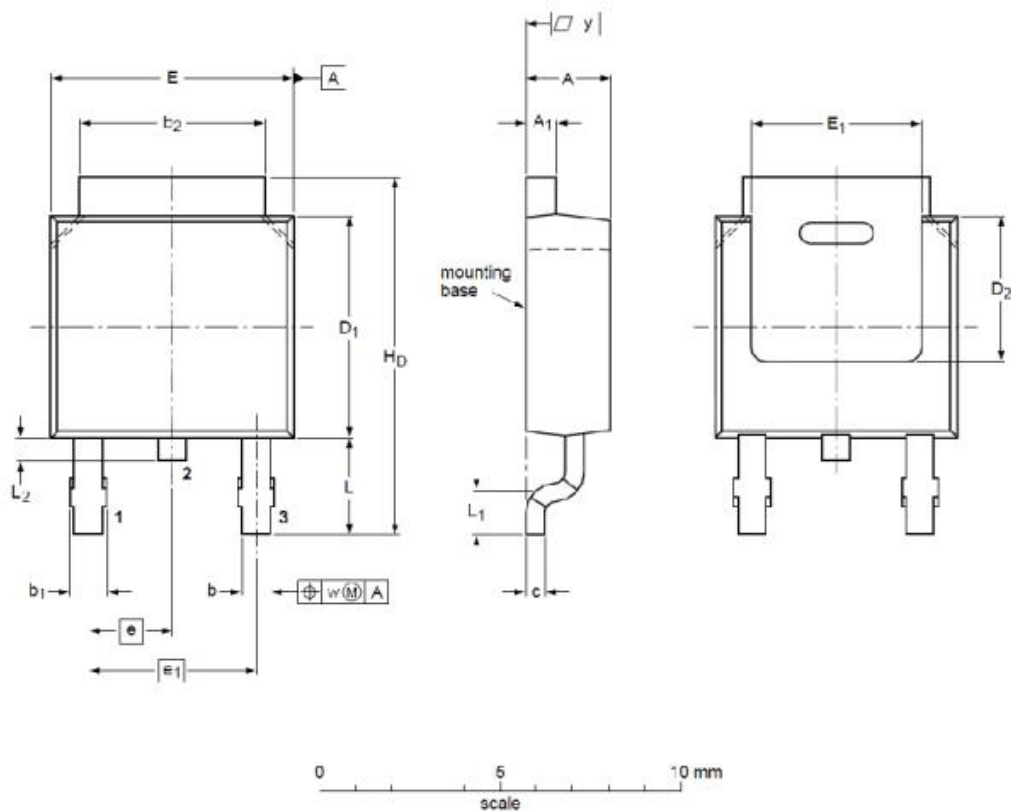


Fig11. Unclamped Inductive Test Circuit and waveforms

TO-252 Mechanical Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	2.22	2.30	2.38	A₁	0.4	0.53	0.65
b	0.68	0.78	0.89	b₁	0.90	0.98	1.10
b₂	5.20	5.33	5.55	c	0.45	0.5	0.55
D₁	5.98	6.10	6.22	D₂	--	4.00	--
E	6.47	6.60	6.73	E₁	5.10	5.28	5.45
e	--	2.28	--	e₁	--	4.57	--
H_D	9.60	10.08	10.40	L	2.75	2.95	3.05
L₁	--	0.50	--	L₂	0.50	--	1.10
w	--	0.20	--	y	0.20	--	--

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