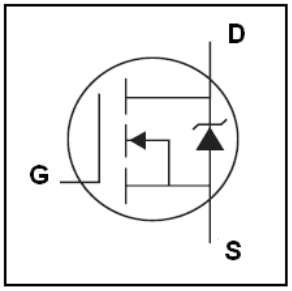
Features

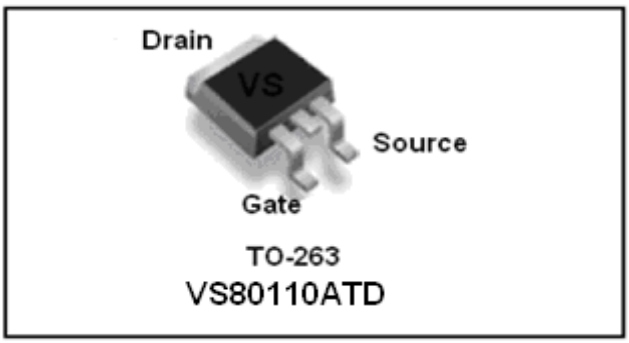
- ♦ Low On-Resistance
- ♦ Fast Switching
- ♦ 100% Avalanche Tested
- ♦ Repetitive Avalanche Allowed up to Tjmax
- ♦ Lead-Free, RoHS Compliant
- ♦



V_{DSS} = 80V

$R_{DS(on)}$ = 5.5mΩ

I_D = 110A



Description

VS80110ATD designed by the trench processing techniques to achieve extremely low on-resistance. Additional features of this design are fast switching speed and improved repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in Automotive applications.

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only;and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (TA) is 25°C, unless otherwise specified.

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	T_C=25°C	80	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	T_C=25°C	400	A
I_D	Continuous Drain Current (V_{GS}=10V)	T_C=25°C	110	A
		T_C=100°C	72	
P_D	Maximum Power Dissipation	T_C=25°C	250	W
		T_C=100°C	165	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.50	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed		900	mJ

Electrical Characteristics@ TJ = 25°C (unless otherwise stated)

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	80	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(Tc=25℃)	V_{DS}=75V,V_{GS}=0V	--	--	100	nA
	Zero Gate Voltage Drain Current(Tc=125℃)	V_{DS}=75V,V_{GS}=0V	--	--	10	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	2	3	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=40A	--	5.5	8	mΩ
gfs	Forward Transconductance	V_{DS}= 10V, I_D=15A	--	32	--	S
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=40V,V_{GS}=0V, f=1MHz	--	4200	--	pF
C_{oss}	Output Capacitance		--	660	--	pF
C_{rss}	Reverse Transfer Capacitance		--	180	--	pF
Q_g	Total Gate Charge	V_{DS}=40V,I_D=50A, V_{GS}=10V	--	85	--	nC
Q_{gs}	Gate-Source Charge		--	22	--	nC
Q_{gd}	Gate-Drain Charge		--	32	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=40V, I_D=50A, R_G=5Ω, V_{GS}=10V	--	40	--	ns
t_r	Turn-on Rise Time		--	20	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	115	--	ns
t_f	Turn-Off Fall Time		--	56	--	ns
Source- Drain Diode Characteristics						
I_{SD}	Source-drain Continuous Current	T_C=25℃	--	--	80	A
I_{SDM}	Pulsed Source-drain Current (Body Diode)		--	--	320	A
V_{SD}	Forward on voltage， T_j=25℃,	I_{SD}=55A,V_{GS}=0V	--	--	1.3	V
t_{rr}	Reverse Recovery Time， T_j=25℃	,I_F=40A,VDD=25V	--	100	--	ns

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature

2.Starting TJ=25℃,RG=25Ω,ID=40A,VGS=10V

Electrical characteristics (curves)

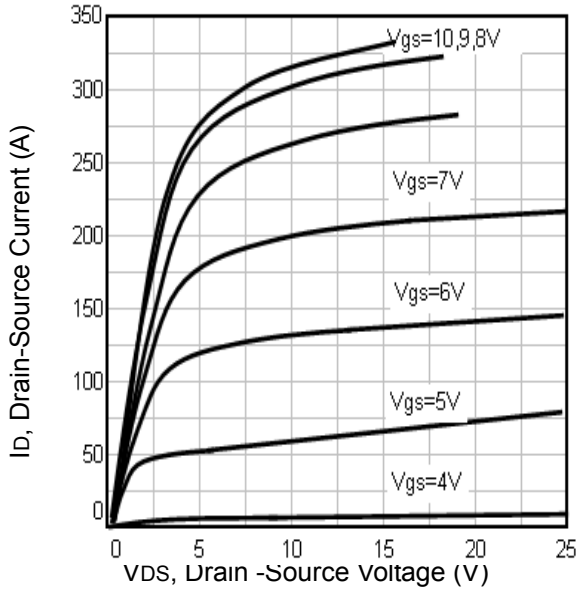


Fig1. Typical Output Characteristics

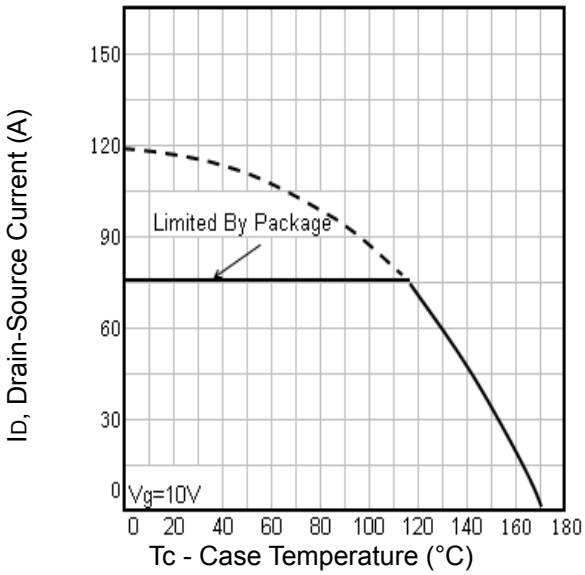


Fig2. Maximum Drain Current Vs.Case Temperature

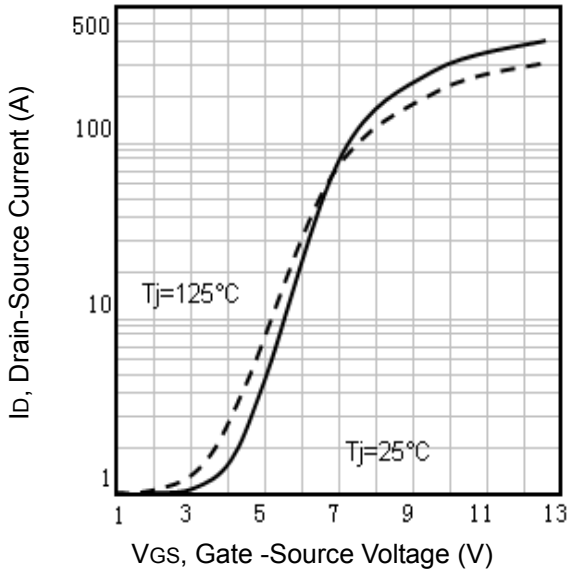


Fig3. Typical Transfer Characteristics

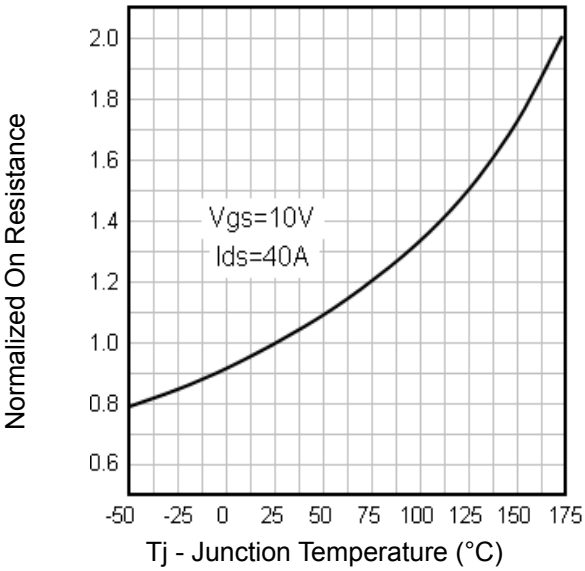


Fig4. Normalized On-Resistance Vs. Temperature

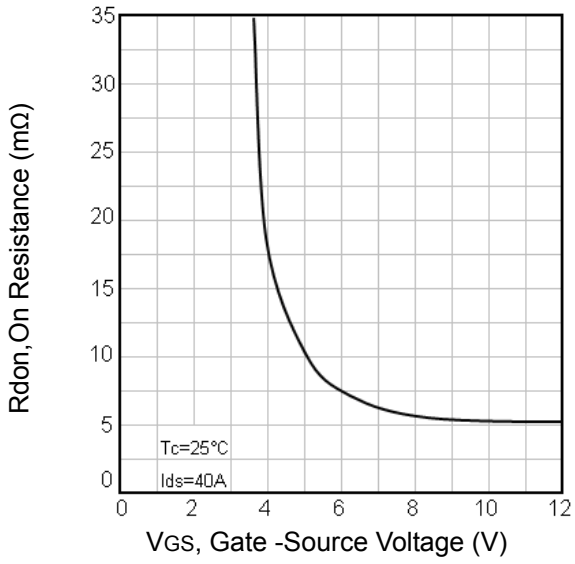


Fig5. Typical On-Resistance Vs. Gate -Source Voltage

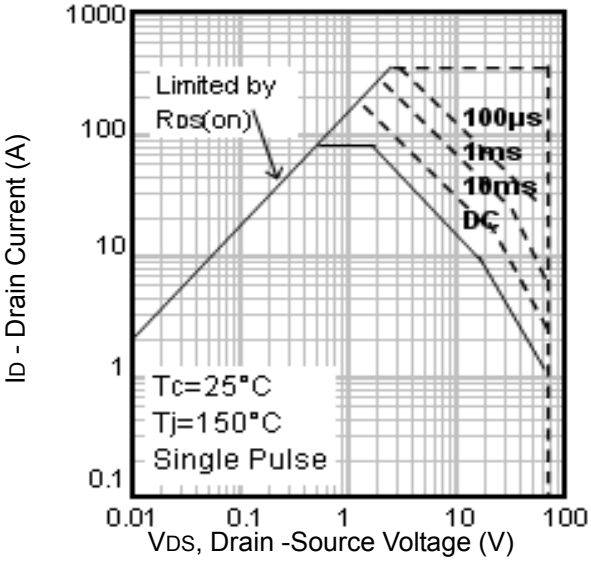


Fig6. Maximum Safe Operating Area

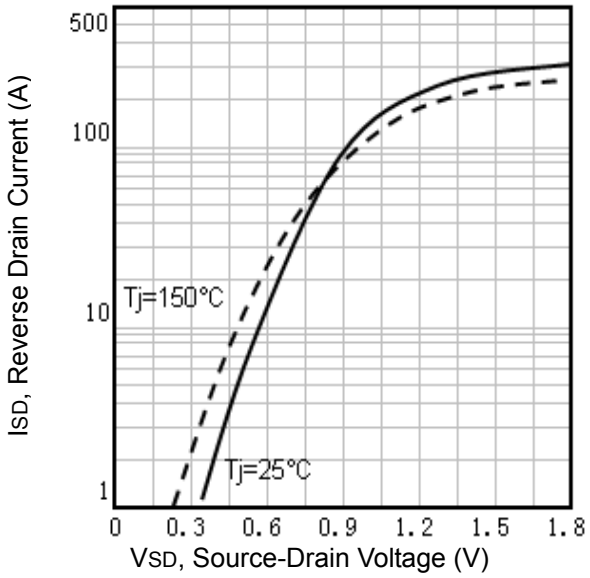


Fig7. Typical Source-Drain Diode Forward Voltage

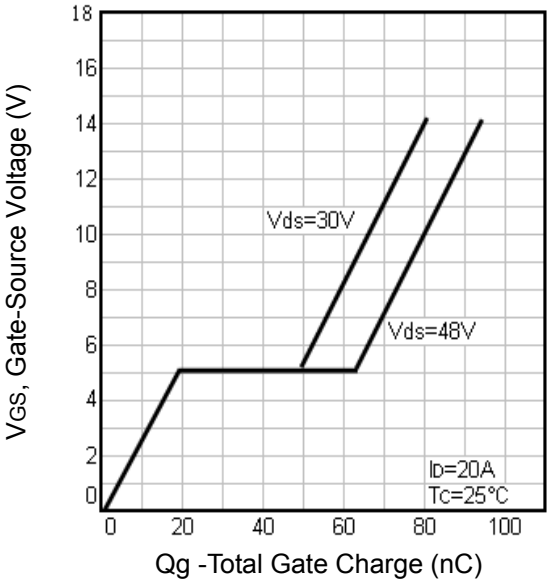


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

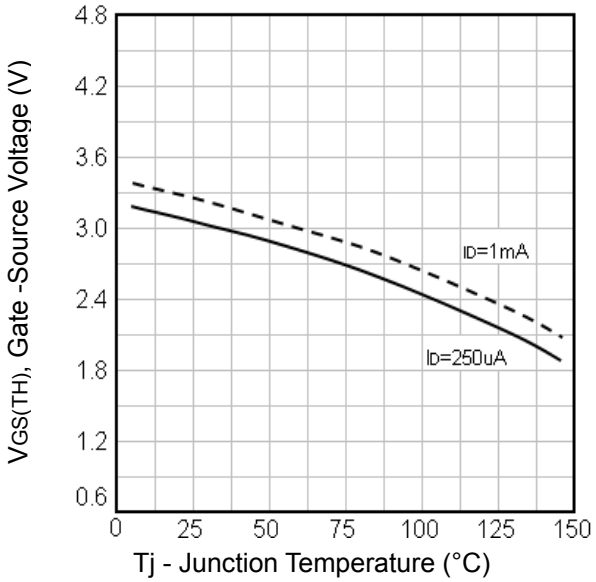


Fig9. Threshold Voltage Vs. Temperature

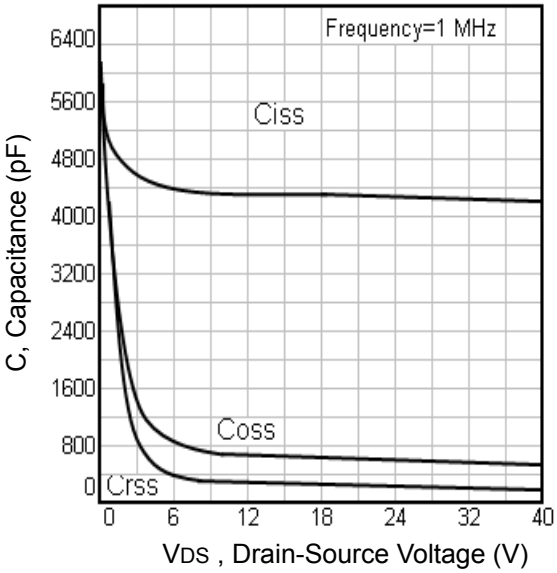


Fig10. Typical Capacitance Vs.Drain-Source Voltage

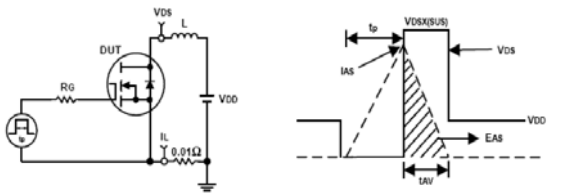


Fig11. Unclamped Inductive Test Circuit and waveforms

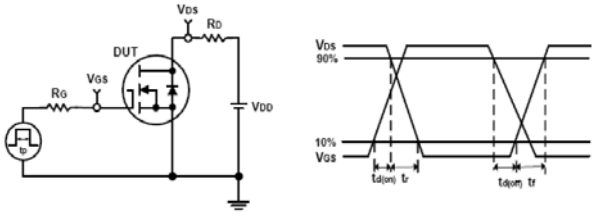
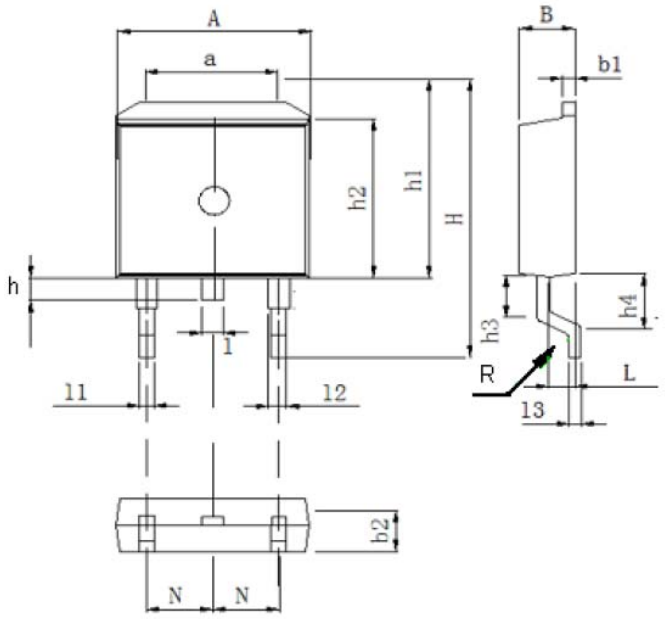


Fig12. Switching Time Test Circuit and waveforms

TO-263 Package Outline



DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.2
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
l	1.3±0.1
l1	0.8±0.1
l2	1.3±0.1
l3	0.5±0.1
N	2.45

Order Information

Product	Marking	Package	Packaging	Min Unit Quantity
VS80110ATD	VS80110ATD	TO-263	800PCS/Reel	1600PCS

Customer Service

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