

General Description

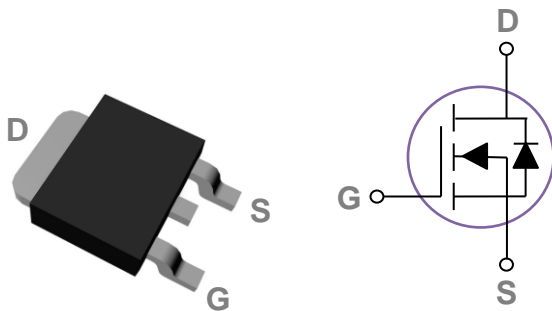
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BVDSS	R _{DS(ON)}	I _D
40V	5.5mΩ	80A

Features

- 40V, 80A, R_{DS(ON)}=5.5mΩ@V_{GS} = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

TO252 Pin Configuration



Applications

- Notebook
- Load Switch
- LED applications
- Hand-Held Device

Absolute Maximum Ratings T_c=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current – Continuous (T _c =25°C)	80	A
	Drain Current – Continuous (T _c =100°C)	50	A
I _{DM}	Drain Current – Pulsed ¹	320	A
P _D	Power Dissipation (T _c =25°C)	88	W
	Power Dissipation – Derate above 25°C	0.59	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	1.7	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250μA	40	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C , I _D =1mA	---	0.03	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =40V , V _{GS} =0V , T _J =25°C	---	---	1	μA
		V _{DS} =32V , V _{GS} =0V , T _J =85°C	---	---	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =20A	---	4.2	5.5	mΩ
		V _{GS} =4.5V , I _D =10A	---	5.3	7	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.0	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-5	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =10A	---	16	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =32V , V _{GS} =4.5V , I _D =10A	---	25	50	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	6.4	13	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	12.1	24	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =20V , V _{GS} =10V , R _G =3.3Ω I _D =1A	---	14.2	28	ns
T _r	Rise Time ^{2, 3}		---	18.3	36	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	38.8	76	
T _f	Fall Time ^{2, 3}		---	13.9	28	
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , F=1MHz	---	2410	3600	pF
C _{oss}	Output Capacitance		---	233	400	
C _{rss}	Reverse Transfer Capacitance		---	152	230	
R _g	Gate resistance	V _{GS} =0V , V _{DS} =0V , F=1MHz	---	1.6	3.2	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	80	A
I _{SM}	Pulsed Source Current		---	---	160	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =1A , T _J =25°C	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

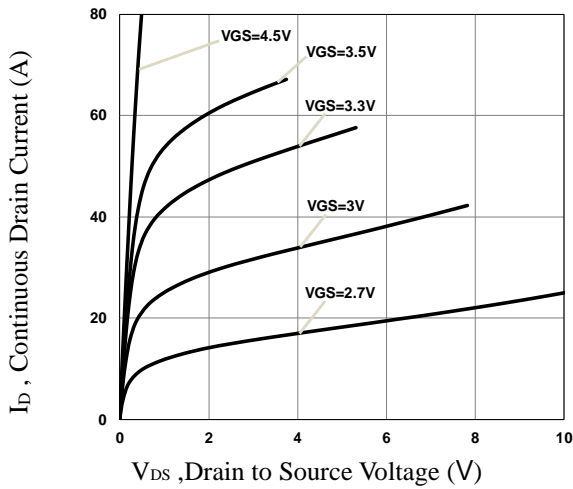


Fig.1 Typical Output Characteristics

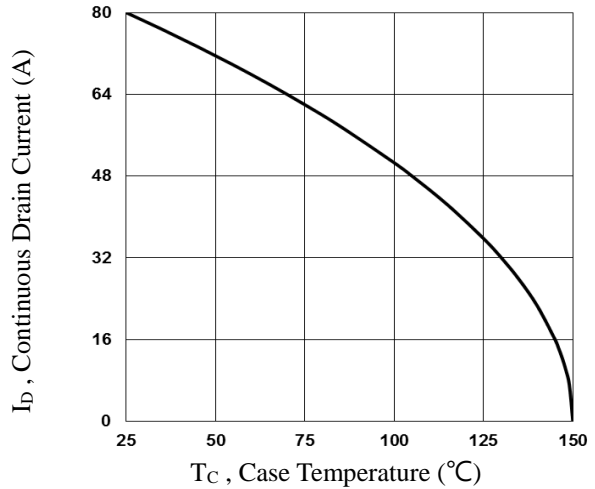


Fig.2 Continuous Drain Current vs. T_C

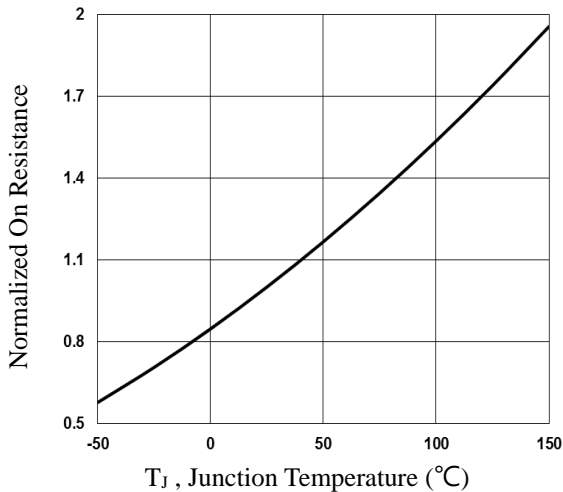


Fig.3 Normalized $R_{DS(on)}$ vs. T_J

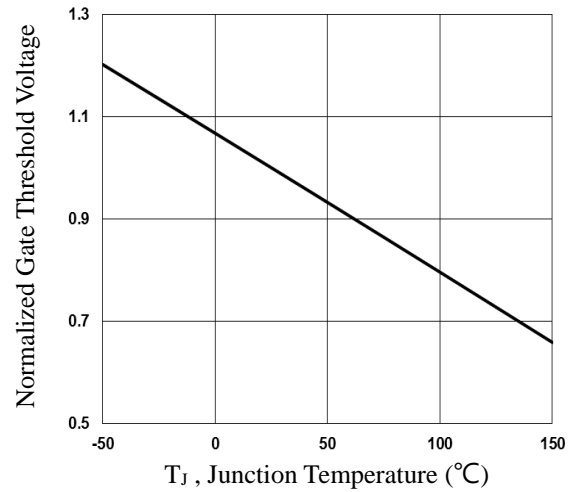


Fig.4 Normalized V_{th} vs. T_J

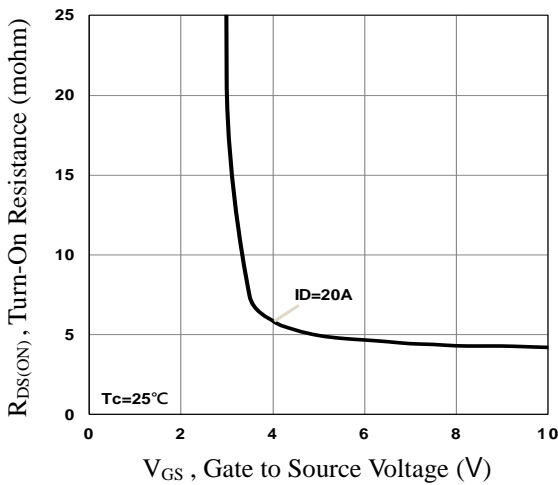


Fig.5 Turn-On Resistance vs. V_{GS}

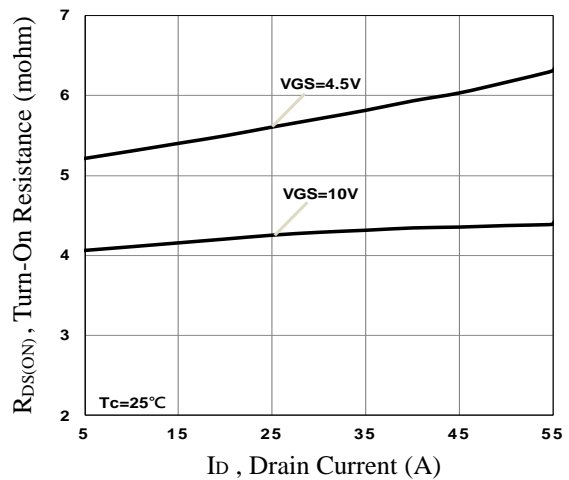


Fig.6 Turn-On Resistance vs. I_D

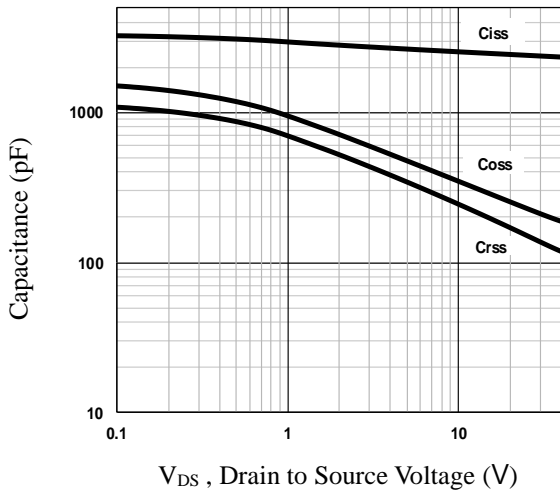


Fig.7 Capacitance Characteristics

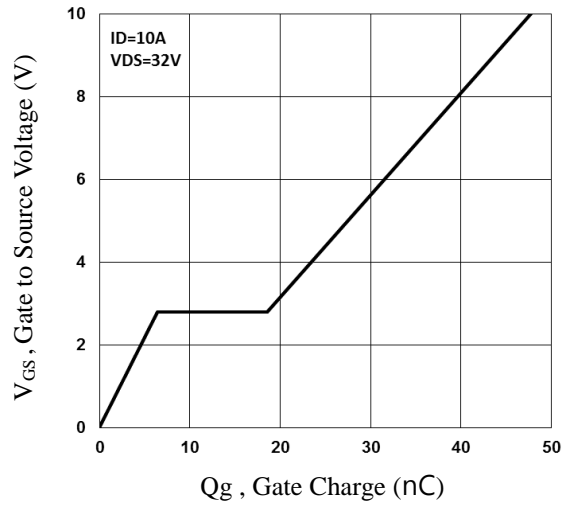


Fig.8 Gate Charge Characteristics

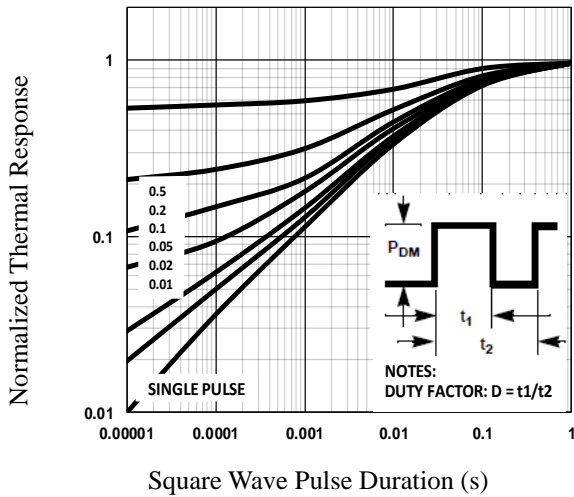


Fig.9 Normalized Transient Impedance

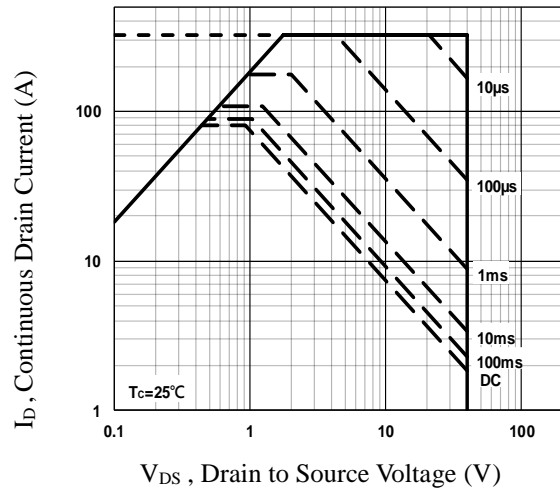


Fig.10 Maximum Safe Operation Area

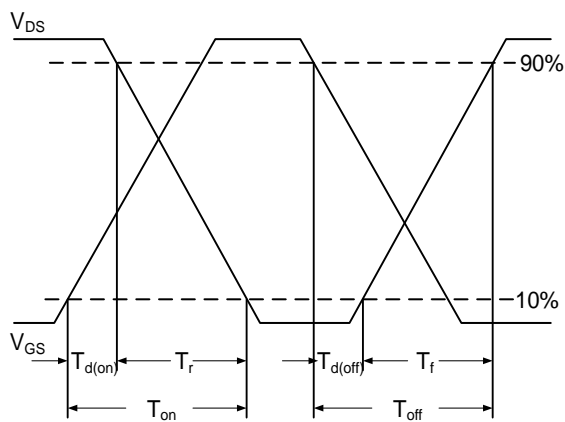


Fig.11 Switching Time Waveform

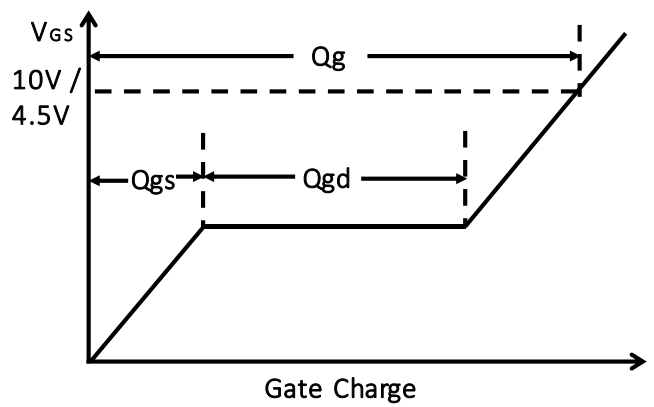
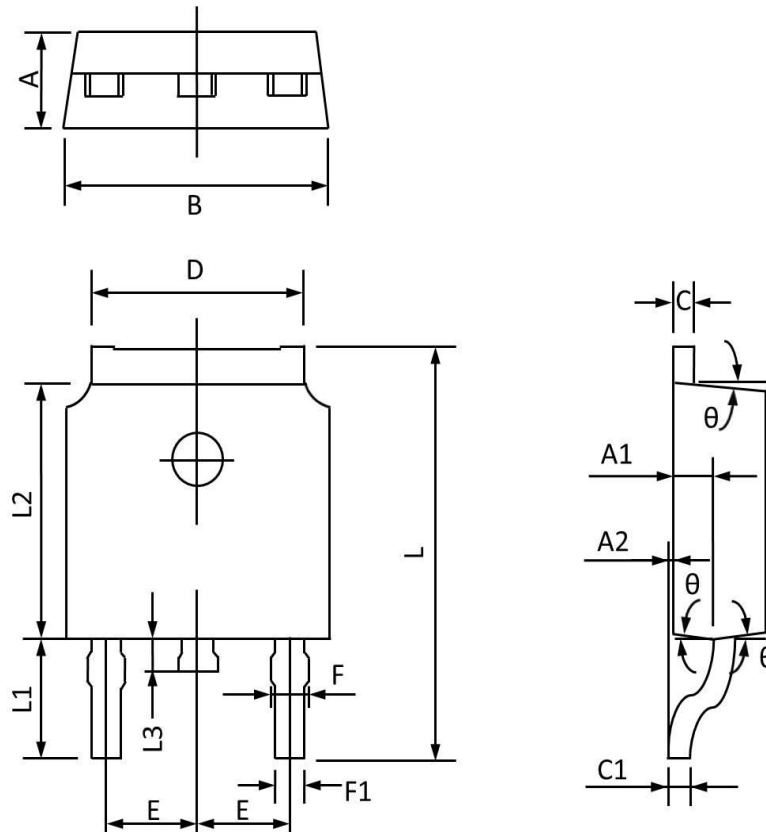


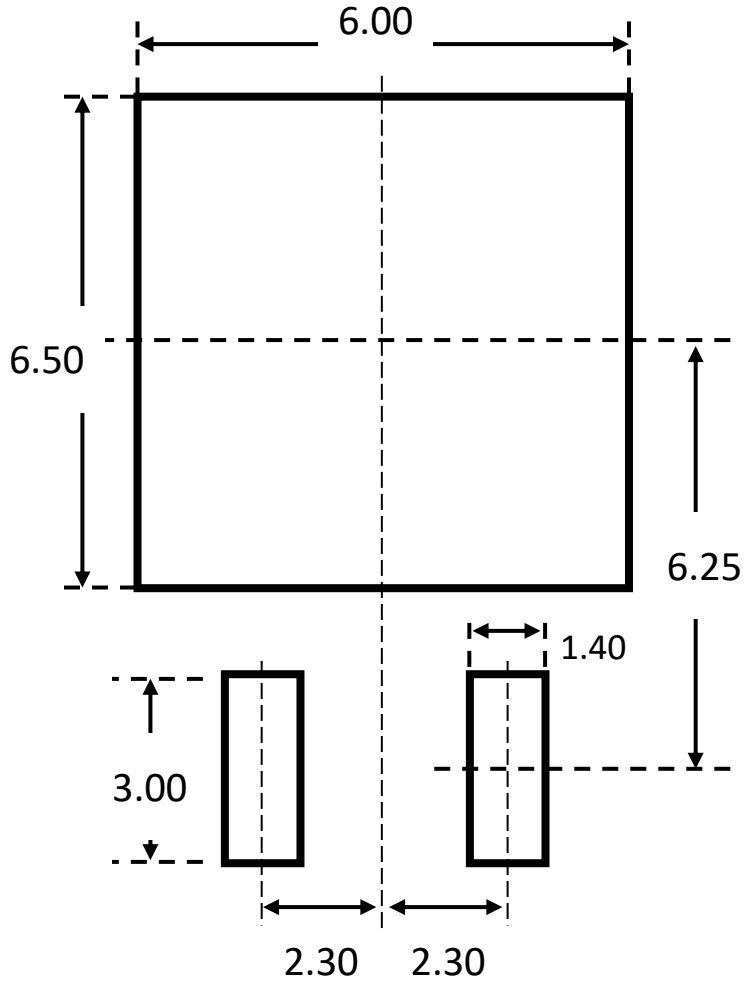
Fig.12 Gate Charge Waveform

TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.900	0.047	0.035
A2	0.250	0.000	0.010	0.000
B	6.800	6.300	0.268	0.248
C	0.600	0.350	0.024	0.014
C1	0.600	0.380	0.024	0.015
D	5.500	5.100	0.217	0.201
E	2.400	2.000	0.094	0.079
F	1.150	0.600	0.045	0.024
F1	0.900	0.500	0.035	0.020
L	10.400	9.400	0.409	0.370
L1	3.100	2.400	0.122	0.094
L2	6.300	5.300	0.248	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°

TO252 RECOMMENDED LAND PATTERN



unit : mm