

30V N-Channel MOSFETs

General Description

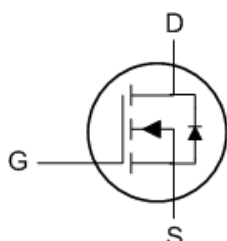
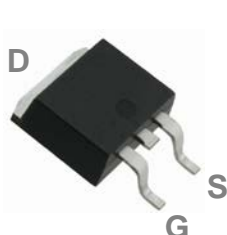
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$ Typ.	I_D
30V	4.8m Ω	60A

Features

- 30V, 60 A, $R_{DS(ON)}$ Typ. = 4.8m Ω @ $V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

TO-252 Pin Configuration



Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_C=25^\circ\text{C}$)	60	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	38	A
I_{DM}	Drain Current – Pulsed ¹	240	A
E_{AS}	Single Pulse Avalanche Energy ²	88	mJ
I_{AS}	Single Pulse Avalanche Current ²	42	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	63	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Note 1: Exceed these limits to damage to the device.

Note 2: Exposure to absolute maximum rating conditions may affect device reliability.

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V , I _D = 250uA	30			V
I _{DSS}	Drain-Source Leakage Current	V _{DS} = 30V , V _{GS} = 0V , T _J = 25°C			1	μA
		V _{DS} = 24V , V _{GS} = 0V , T _J = 125°C			10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ± 20V , V _{DS} = 0V			± 100	nA
R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} = 10V , I _D = 20A		4.8	6	mΩ
		V _{GS} = 4.5V , I _D = 10A		6.5	9	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 250uA	1	1.6	2.5	V
△V _{GS(th)}	V _{GS(th)} Temperature Coefficient			-4		mV/°C
gfs	Forward Transconductance	V _{DS} = 5V , I _D = 20A		106		S

Dynamic Characteristics

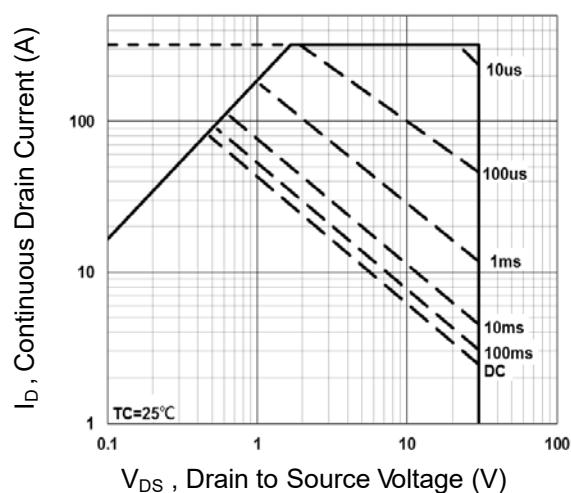
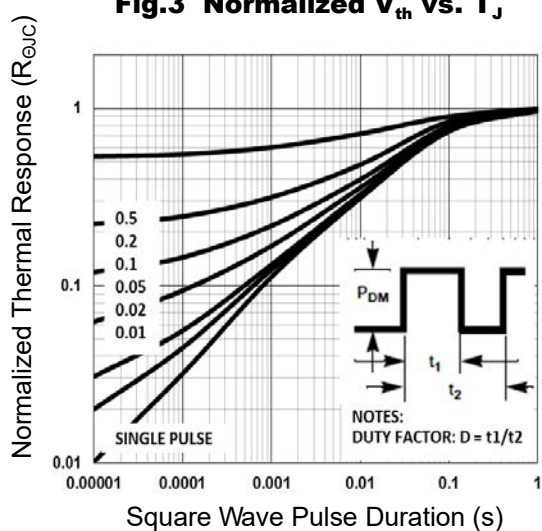
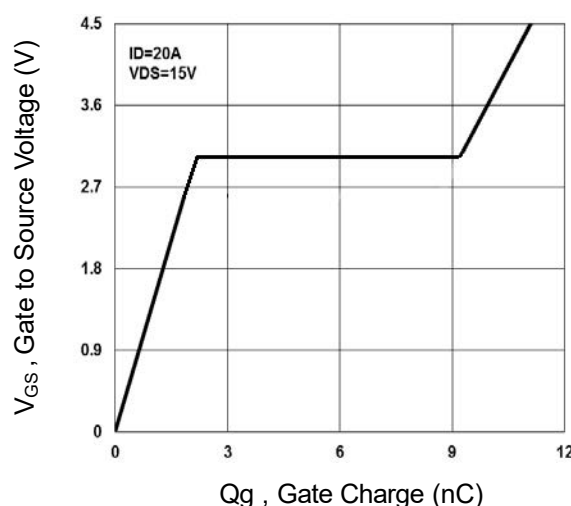
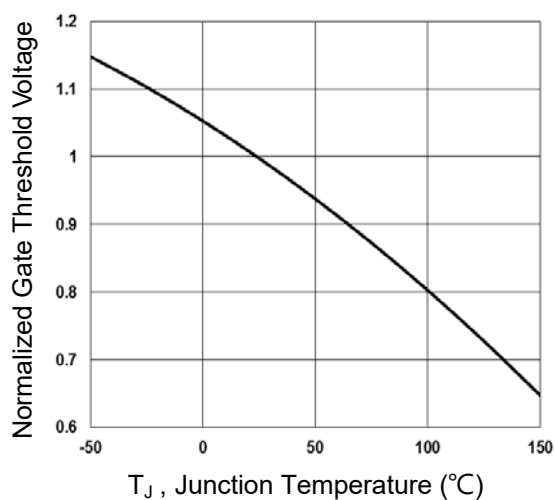
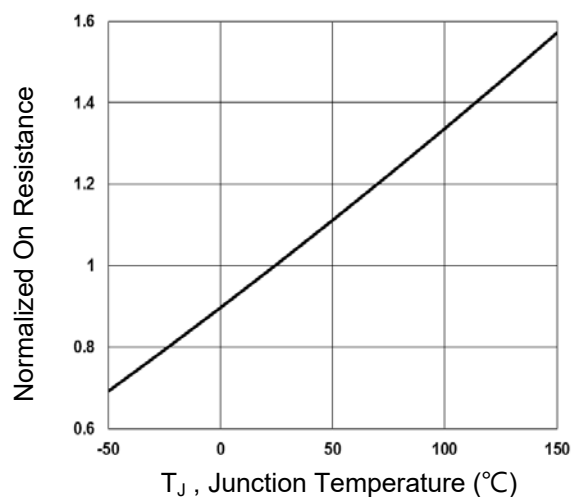
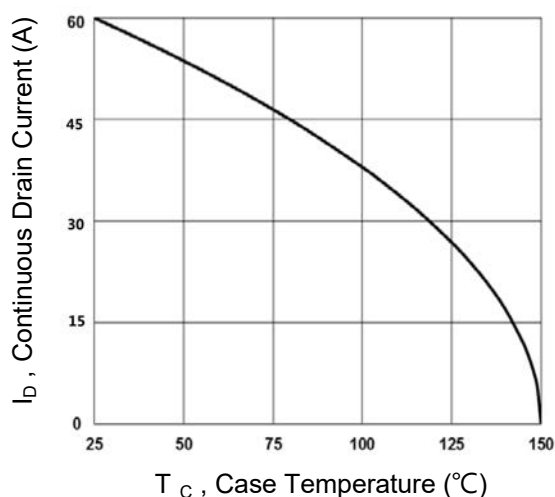
Q _g	Total Gate Charge ^{3, 4}	V _{DS} =15V , V _{GS} =4.5V , I _D =20A		11.1		nC
Q _{gs}	Gate-Source Charge ^{3, 4}			1.85		
Q _{gd}	Gate-Drain Charge ^{3, 4}			6.8		
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =15V , V _{GS} =10V , R _G =3.3Ω I _D =15A		7.5		ns
T _r	Rise Time ^{3, 4}			14.5		
T _{d(off)}	Turn-Off Delay Time ^{3, 4}			35.2		
T _f	Fall Time ^{3, 4}			9.6		
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , F=1MHz		1160		pF
C _{oss}	Output Capacitance			200		
C _{rss}	Reverse Transfer Capacitance			180		
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		2.5		Ω

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current			60	A
I _{SM}	Pulsed Source Current ³				120	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V , I _S =1A , T _J =25°C			1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=42A., R_G=25Ω, Starting T_J=25°C.
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.



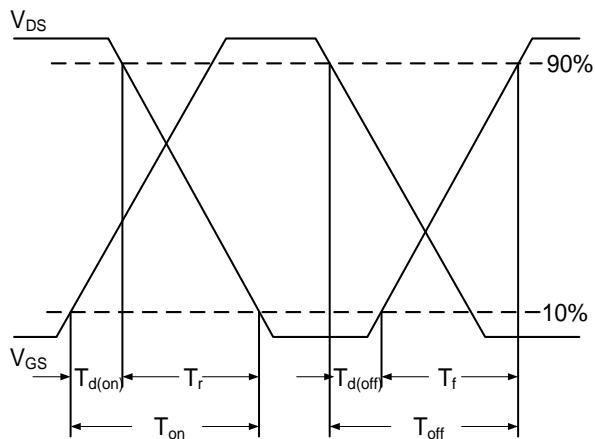


Fig.7 Switching Time Waveform

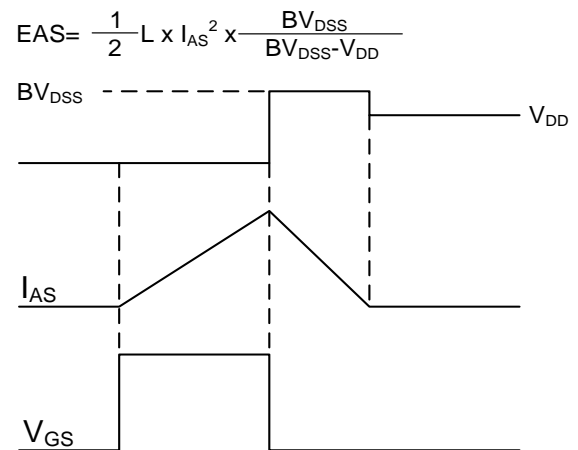
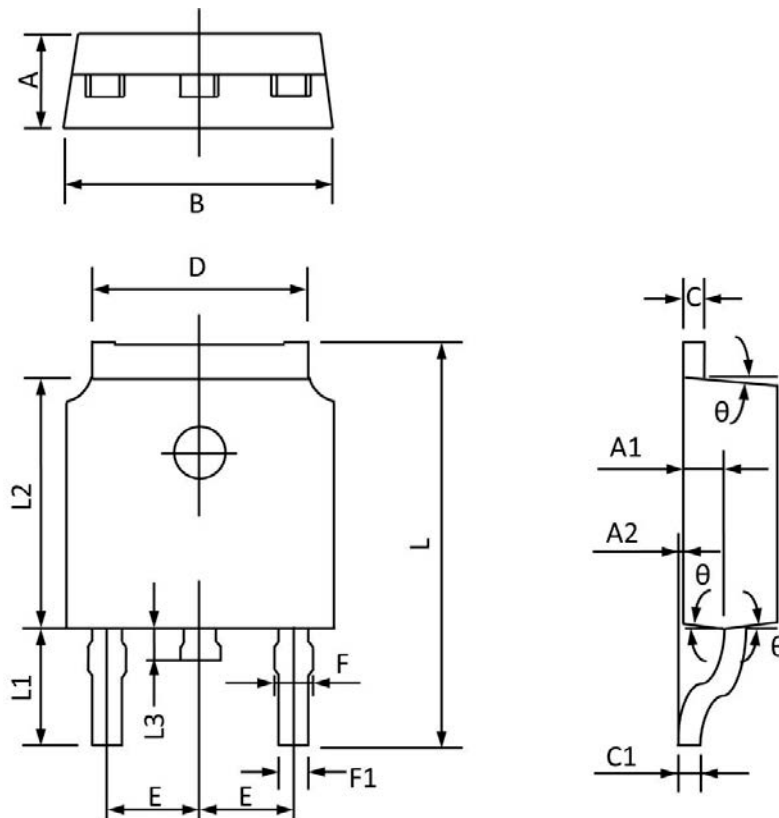


Fig.8 EAS Waveform

TO-252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
θ	3°	9°	3°	9°