

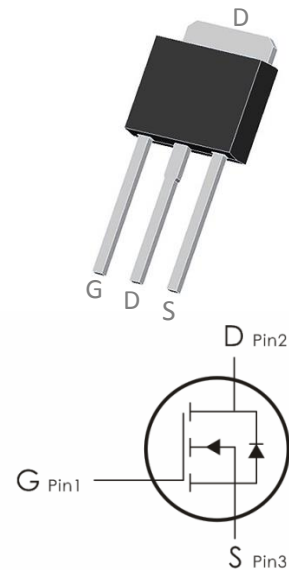
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=60V, I_D=11A, R_{DS(ON)}<75m\Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	11	A
	Continuous Drain Current- $T_C=100^\circ C$	7	
	Pulsed Drain Current ¹	44	
E_{AS}	Single Pulse Avalanche Energy	25	mJ
P_D	Power Dissipation, $T_C=25^\circ C$	25	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOU10N06	10N06	TO-251

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μA	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μA	1.2	1.8	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =6A	---	60	75	mΩ
		V _{GS} =4.5V, I _D =3A	---	70	90	
G _{FS}	Forward Transconductance	V _{DS} =10V, I _D =3A	---	4	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	500	725	pF
C _{oss}	Output Capacitance		---	45	65	
C _{rss}	Reverse Transfer Capacitance		---	16	30	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ³	V _{DD} =30V, I _D =1A, V _{GS} =10V, R _{GEN} =3.3Ω	---	2.9	---	ns
t _r	Rise Time ^{2,3}		---	9.5	---	ns
t _{d(off)}	Turn-Off Delay Time		---	18.4	---	ns
t _f	Fall Time ^{2,3}		---	5.3	---	ns
Q _g	Total Gate Charge ³	V _{GS} =10V, V _{DS} =48V, I _D =6A	---	9.3	13	nC
Q _{gs}	Gate-Source Charge		---	2.1	3	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	1.8	4	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =1A	---	---	1	V

Is	Continuous Source Current	$V_g=V_d=0V$	---	---	11	A
Ism	Pulsed Source Current		---	---	44	A
Qrr	Reverse Recovery Charge	$V_{GS}=30V, I_S=1A$, $dI/dt=100A/\mu s$	---	14.3	---	NS
Trr	Reverse Recovery Time		---	23.2	---	NC

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=7A, R_G=25\Omega$, Starting $T_J=25^\circ C$
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

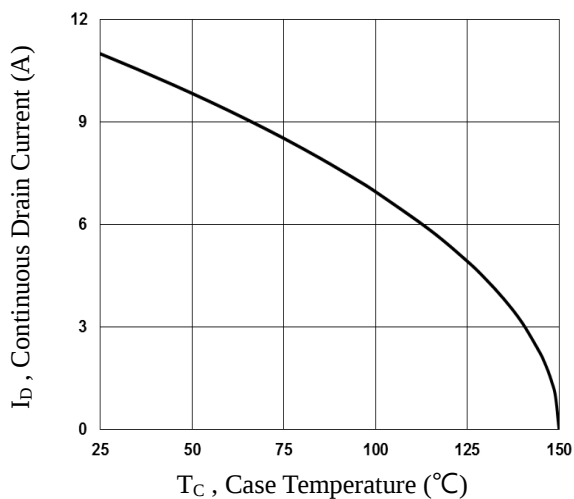


Fig.1 Continuous Drain Current vs. T_C

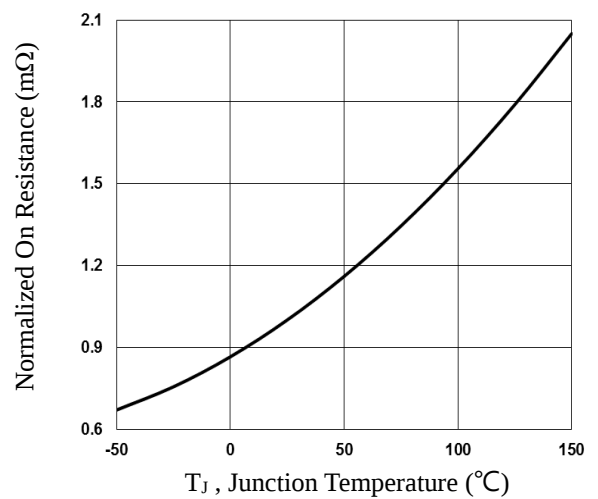


Fig.2 Normalized RDSON vs. T_J

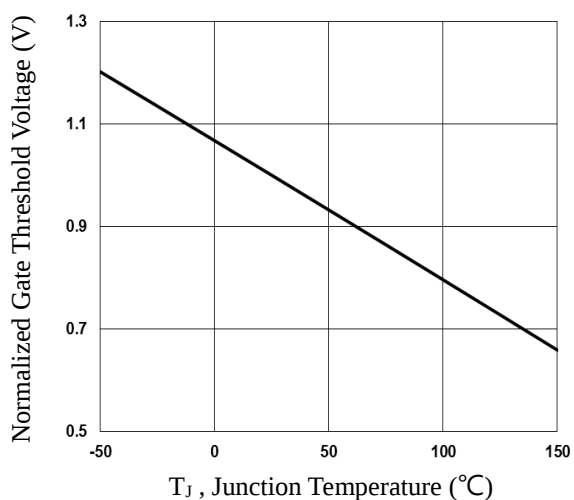


Fig.3 Normalized V_{th} vs. T_J

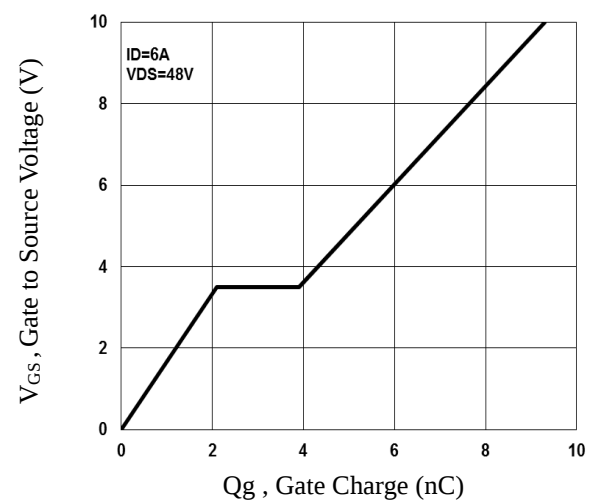


Fig.4 Gate Charge Characteristics

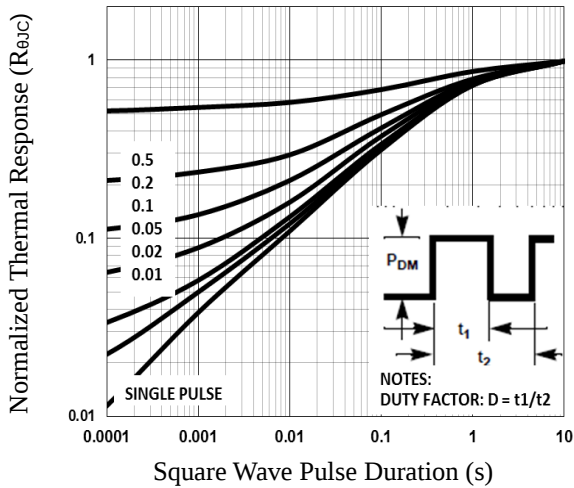


Fig.5 Normalized Transient Impedance

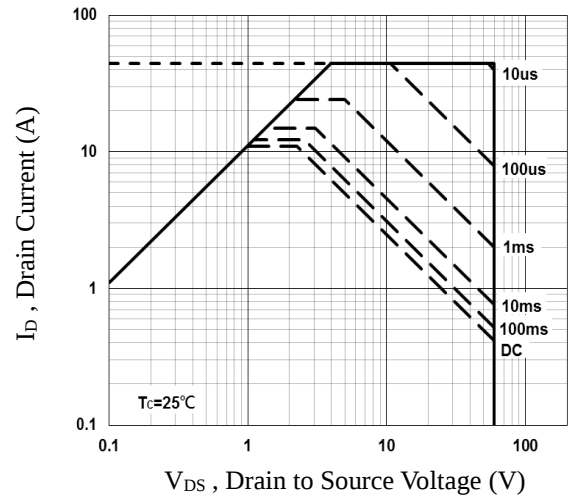


Fig.6 Maximum Safe Operation Area

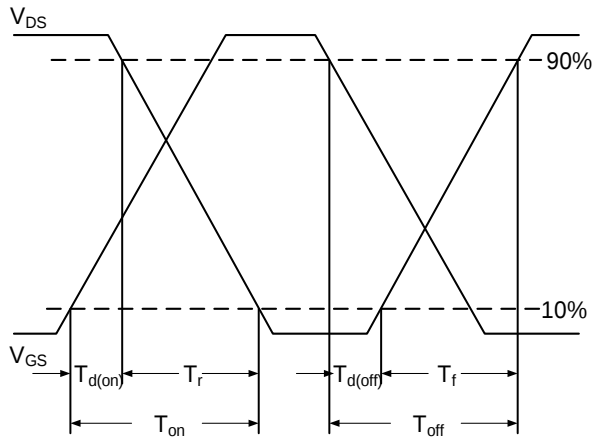


Fig.7 Switching Time Waveform

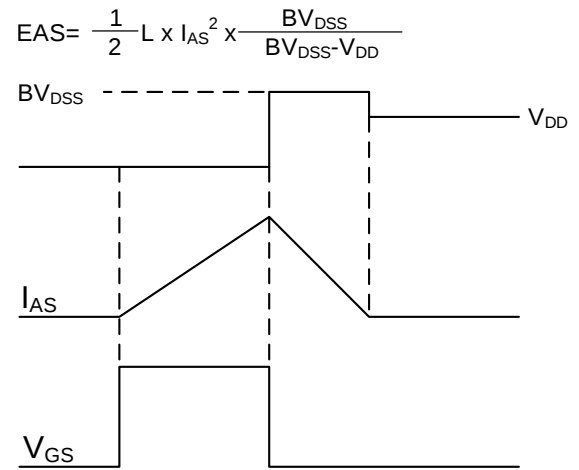


Fig.8 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$