

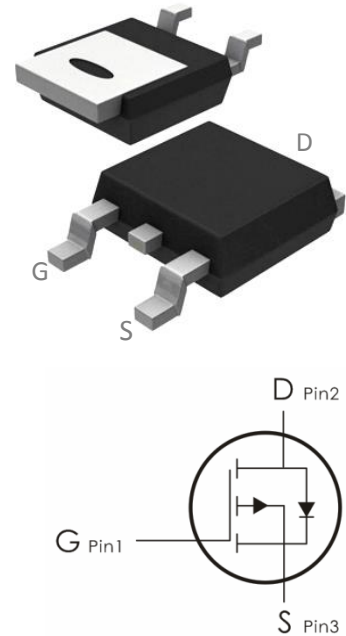
Description:

This P-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) $V_{DS}=-60V, I_D=-30A, R_{DS(on)}<35m\Omega @ V_{GS}=-10V$
- 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	-30	A
	Continuous Drain Current- $T_C=100^{\circ}C$	-19	
	Pulsed Drain Current ¹	---	
E_{AS}	Single Pulse Avalanche Energy	225	mJ
P_D	Power Dissipation	50	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^{\circ}C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	42	

Package Marking and Ordering Information:

Part NO.	Marking	Package
DOD409	D409	TO-252

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 μ A	-60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-60V	---	---	-1	μ A
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 μ A	-1	-1.8	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance②	V _{GS} =-10V, I _D =-15A	---	26	35	m Ω
		V _{GS} =-4.5V, I _D =-10A	---	32	40	
G _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-15A	---	---	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	---	2535	---	pF
C _{oss}	Output Capacitance		---	130		
C _{rss}	Reverse Transfer Capacitance		---	75		
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =-30V, I _D =-10A, R _{GEN} =6.8 Ω , V _{GS} =-10V	---	14	---	ns
t _r	Rise Time		---	18	---	ns
t _{d(off)}	Turn-Off Delay Time		---	42	---	ns
t _f	Fall Time		---	15	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-10A	---	46	---	nC
Q _{gs}	Gate-Source Charge		---	11	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =-15A, T _J =25℃	---	-0.88	-1.2	V

t_{rr}	Reverse Recovery Time	$I_{sd} = -20A, V_{GS} = 0V$ $.di/dt = -500A/\mu s$	---	28	---	ns
Q_{rr}	Reverse Recovery Charge		---	165	---	nc

Notes:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. Pulse width $\leq 300 \mu s$; duty cycle $\leq 2\%$.
3. Limited by T_{Jmax} , starting $T_J = 25^\circ C$, $L = 0.5mH$, $R_G = 25 \Omega$, $I_{AS} = -32A$, $V_{GS} = -10V$. Part not recommended for use above this value

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

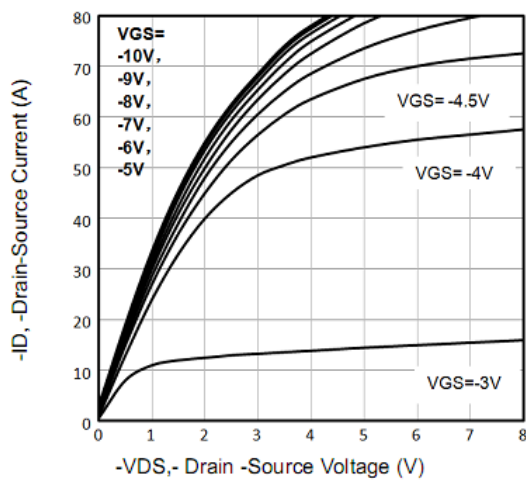


Fig1. Typical Output Characteristics

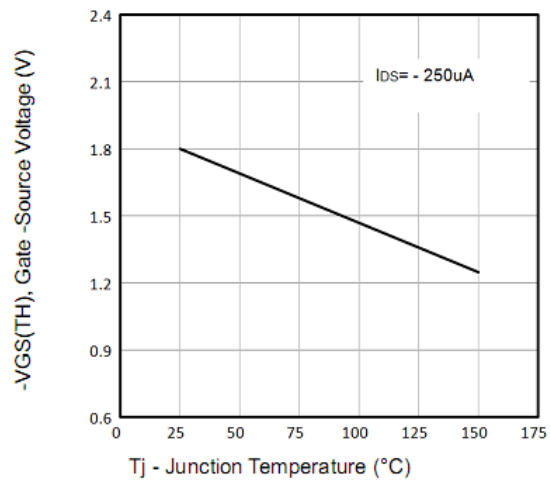


Fig2. -VGS(TH) Gate -Source Voltage Vs. T_j

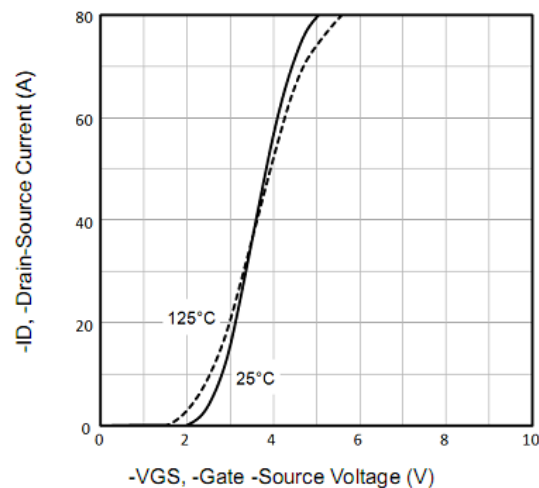


Fig3. Typical Transfer Characteristics

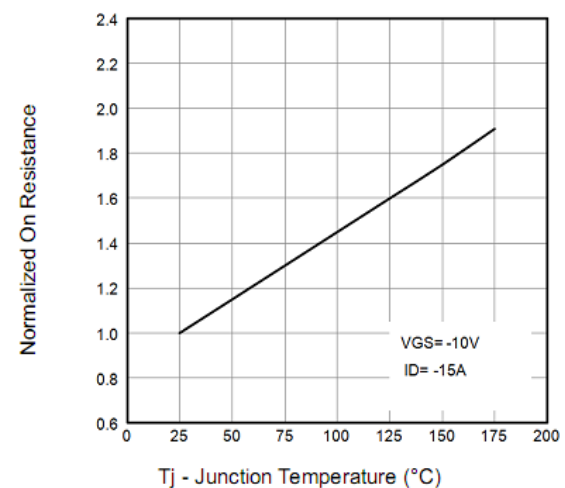


Fig4. Normalized On-Resistance Vs. T_j

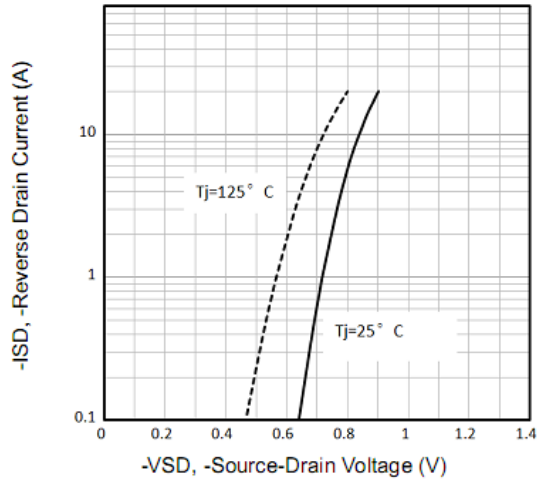


Fig5. Typical Source-Drain Diode Forward Voltage

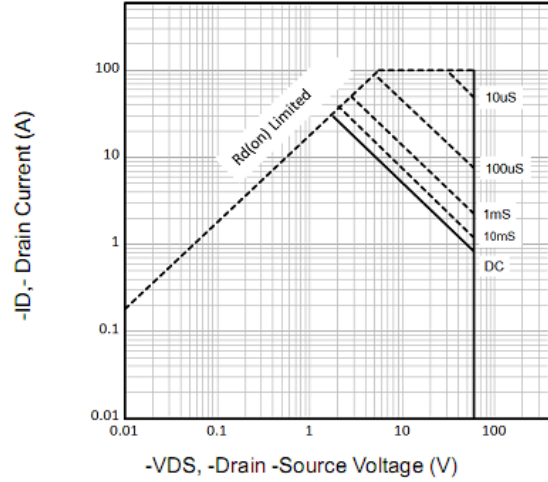


Fig6. Maximum Safe Operating Area

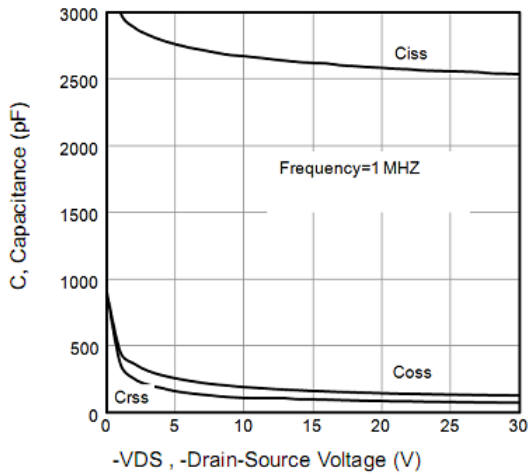


Fig7. Typical Capacitance Vs. Drain-Source Voltage

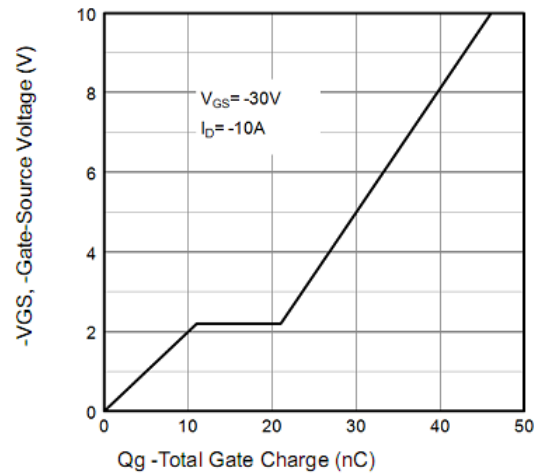


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

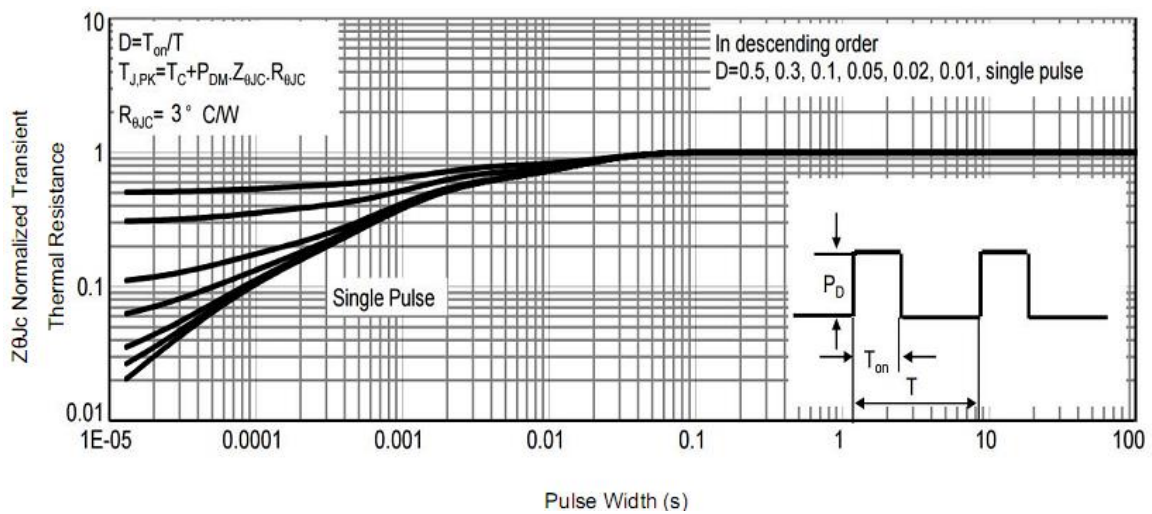


Fig9. Normalized Maximum Transient Thermal Impedance

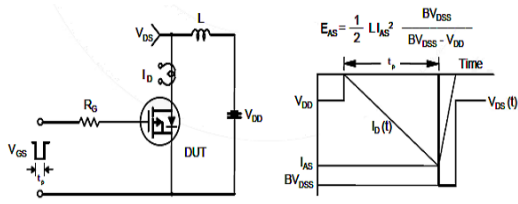


Fig10. Unclamped Inductive Test Circuit and Waveforms

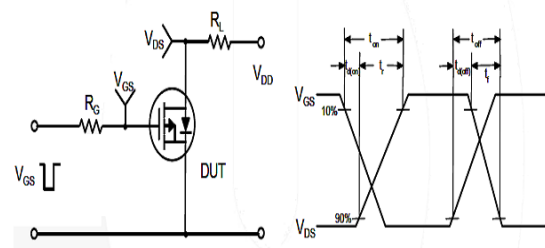


Fig11. Switching Time Test Circuit and waveforms