

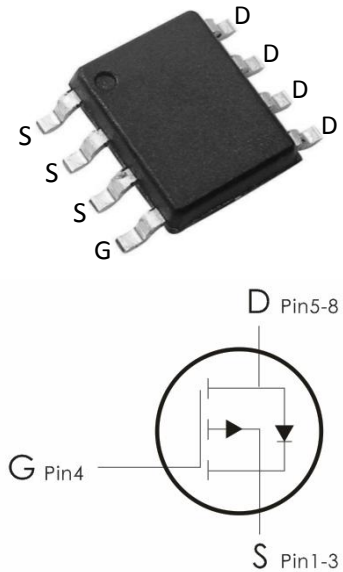
Description:

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) $V_{DS}=-30V, I_D=-15A, R_{DS(on)} < 10m\Omega @ V_{GS}=-10V$ (typ: $7.5m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 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	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	-15	A
	Continuous Drain Current- $T_C=100^\circ C$	-10	
I_{DM}	Drain Current-Pulsed ¹	-60	A
E_{AS}	Single Pulse Avalanche Energy ²	121	mJ
P_D	Power Dissipation	25.6	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	4.9	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DO4413	4413	SOP-8

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V,	---	---	-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	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-8A	---	7.5	10	m Ω
		V _{GS} =-4.5V, I _D =-6A	---	11.6	16	
		Dynamic Characteristics				
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	3550	---	pF
C _{OSS}	Output Capacitance		---	400	---	
C _{rSS}	Reverse Transfer Capacitance		---	360	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DD} =-15V, V _{GS} =-10V I _D =-20A, R _{GEN} =2.5 Ω	---	14	---	ns
t _r	Rise Time ^{3,4}		---	19	---	ns
t _{d(off)}	Turn-Off Delay Time ^{3,4}		---	65	---	ns
t _f	Fall Time ^{3,4}		---	50	---	ns
Q _g	Total Gate Charge ^{3,4}	V _{DS} =-15V , V _{GS} =-10V , I _D =-20A	---	35	---	nC
Q _{gs}	Gate-Source Charge ^{3,4}		---	6.2	---	nC
Q _{gd}	Gate-Drain “Miller” Charge ^{3,4}		---	9.2	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	-40	A
I _{SM}	Pulsed Source Current		---	---	-160	A

V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-30A$	---	-0.8	-1.2	V
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Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J=25^{\circ}C$, $V_{DD}=-15V$, $V_G=-10V$, $L=0.5mH$, $R_G=25\Omega$, $I_{AS}=-22A$
3. PulseTest: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

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

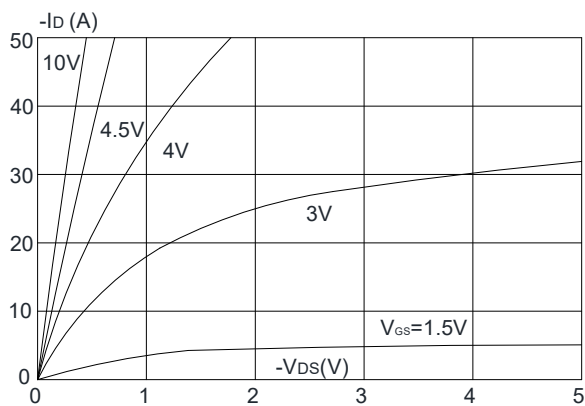


Figure1: Output Characteristics

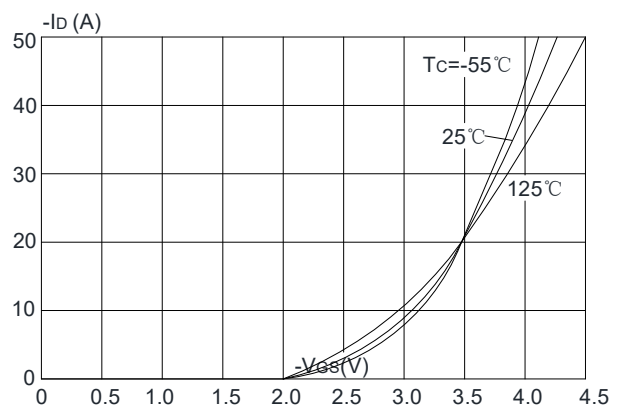


Figure 2: Typical Transfer Characteristics

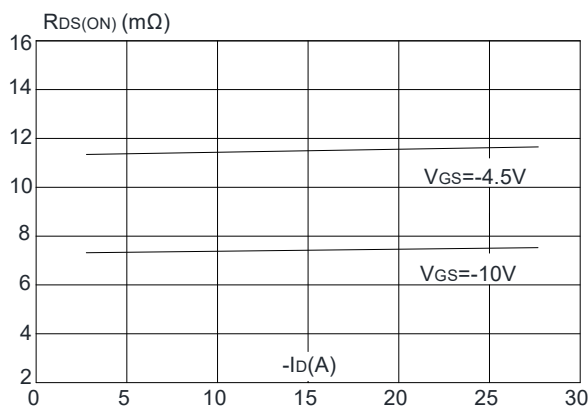


Figure 3: On-resistance vs. Drain Current

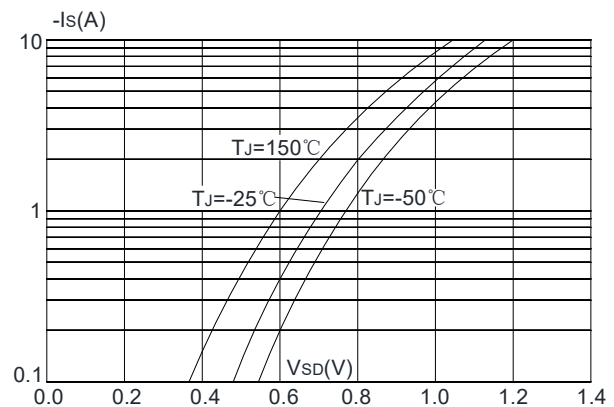


Figure 4: Body Diode Characteristics

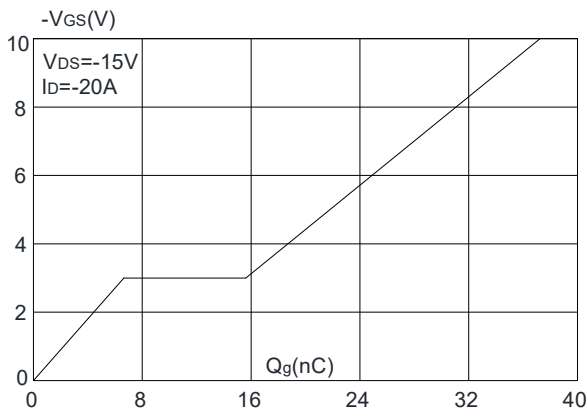


Figure 5: Gate Charge Characteristics

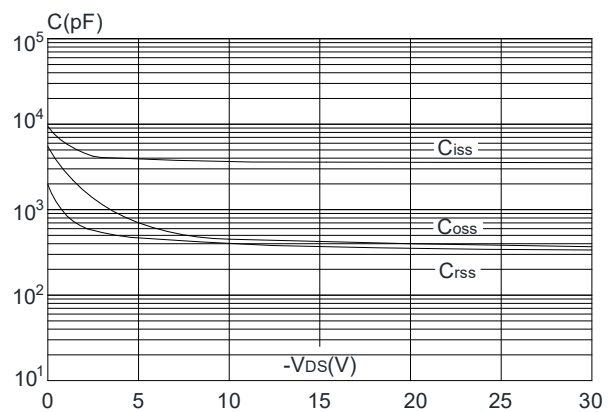


Figure 6: Capacitance Characteristics

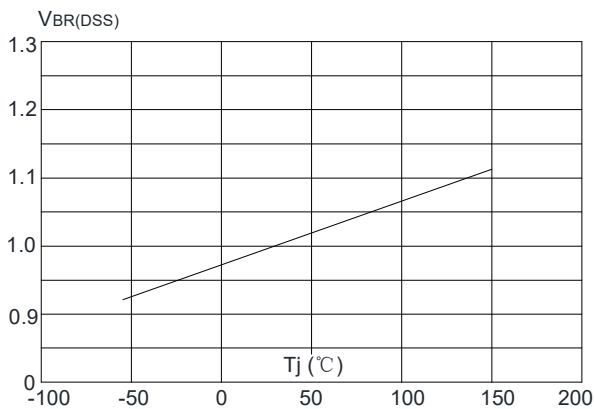


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

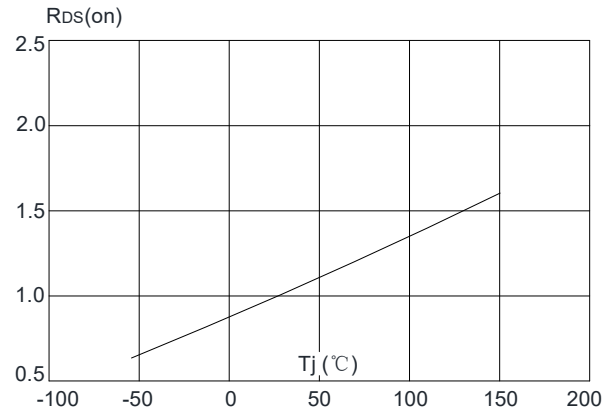


Figure 8: Normalized on Resistance vs. Junction Temperature

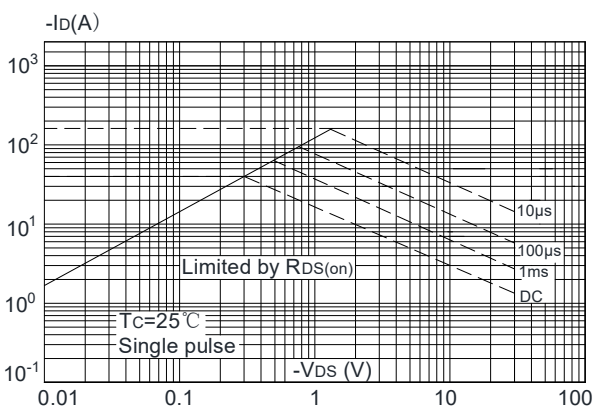


Figure 9: Maximum Safe Operating Area

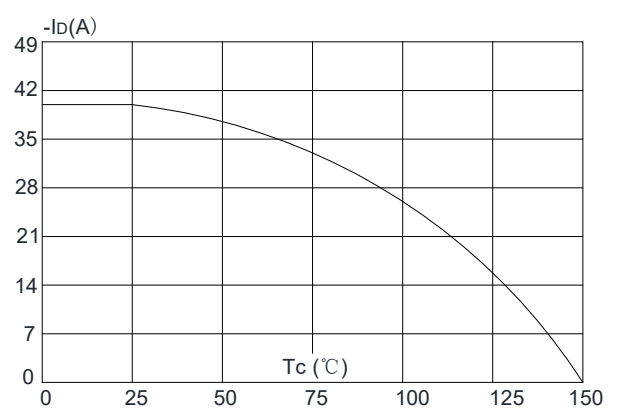


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

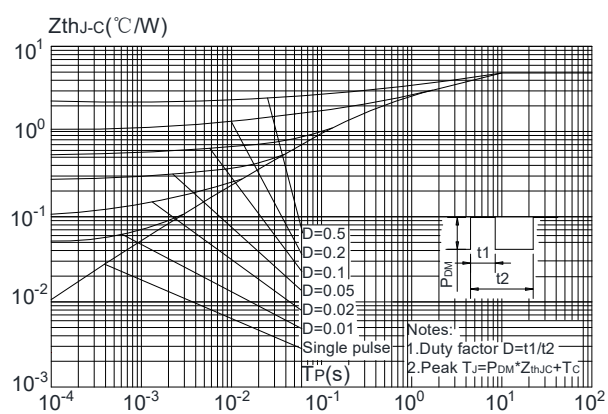


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case