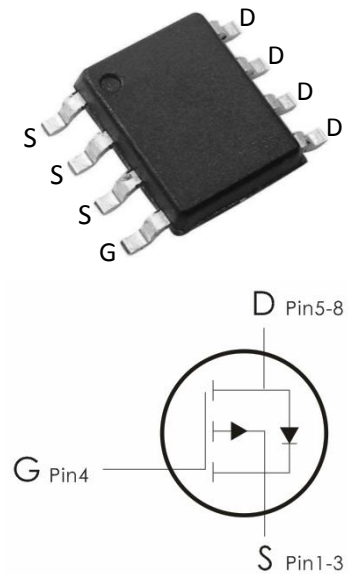


Description:

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) $V_{DS}=-30V, I_D=-15A, R_{DS(ON)}<10m\ \Omega$ @ $V_{GS}=-10V$
- 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: ($T_C=25^\circ\text{C}$ 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- $T_C=25^\circ\text{C}$	-15	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	-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	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction to Case	4.9	$^\circ\text{C}/\text{W}$

Package Marking and Ordering Information:

Part NO.	Marking	Package
DO4409	4409	SOP-8

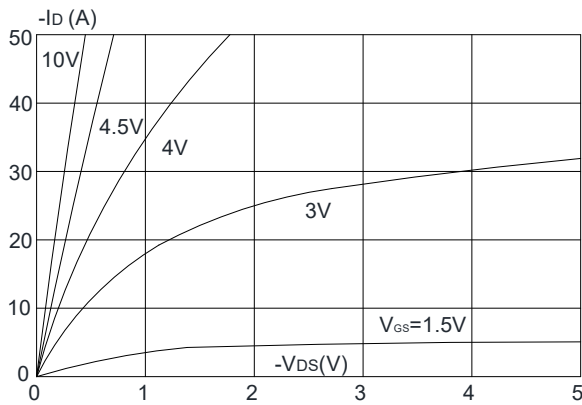
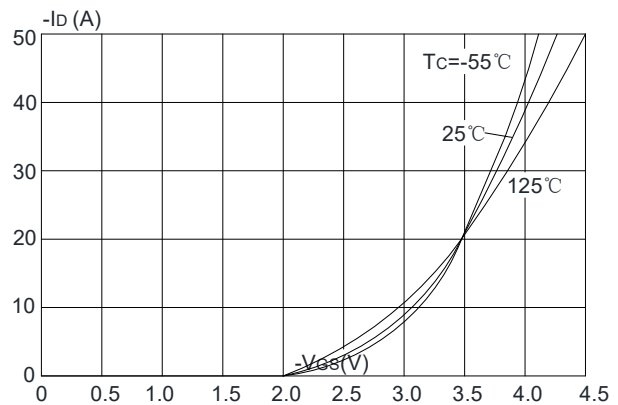
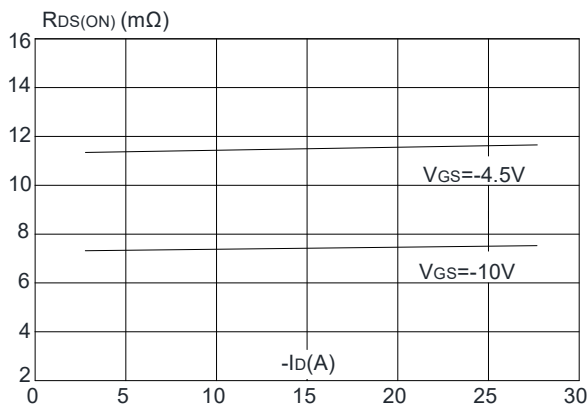
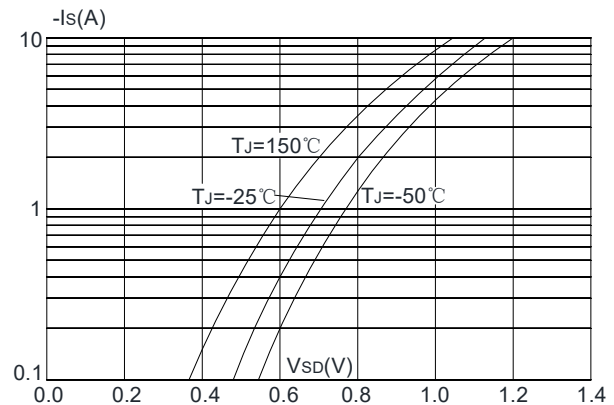
Electrical Characteristics: ($T_C=25^\circ\text{C}$ unless otherwise noted)

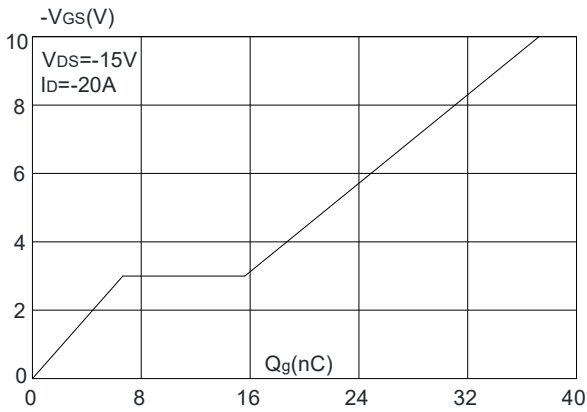
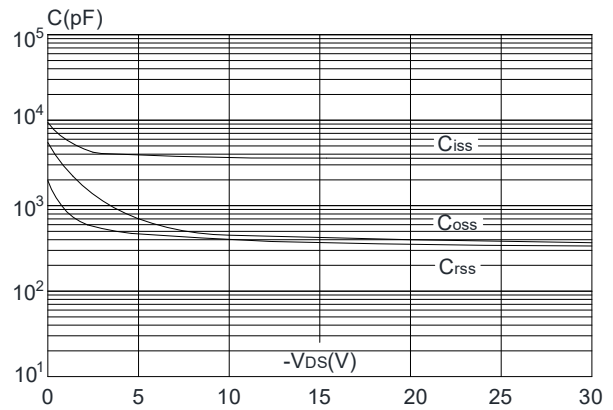
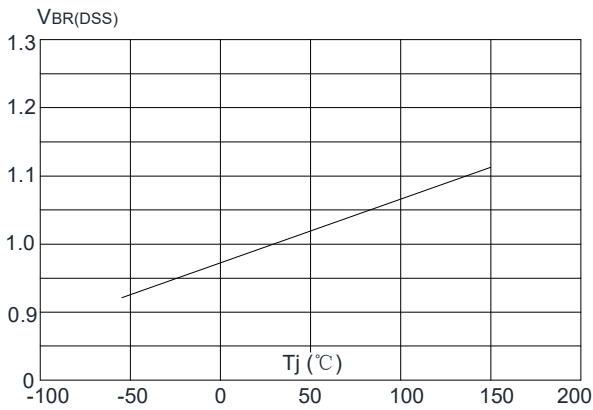
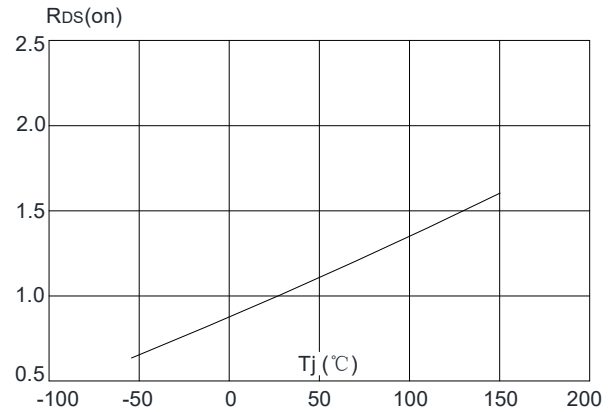
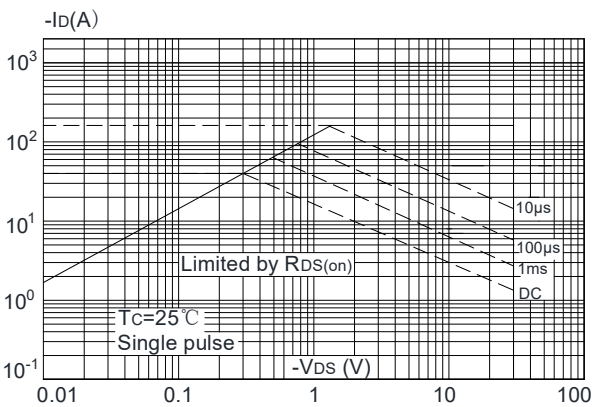
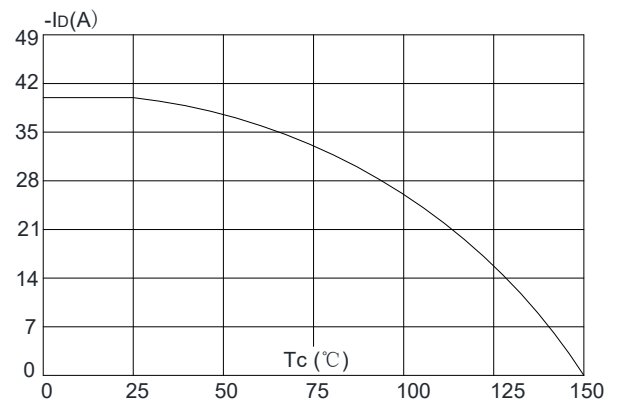
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V,$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-1.6	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=-10V, I_D=-8A$	---	7.5	10	$m\ \Omega$
		$V_{GS}=-4.5V, I_D=-6A$	---	11.6	16	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	3550	---	μF
C_{oss}	Output Capacitance		---	400	---	
C_{rss}	Reverse Transfer Capacitance		---	360	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ^{3,4}	$V_{DD}=-15V, V_{GS}=-10V$ $I_D=-20A, R_{GEN}=2.5\ \Omega$	---	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	$V_G=V_D=0V, \text{Force Current}$	---	---	-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°C, VDD=-15V, V_G=-10V, L=0.5mH, R_G=25Ω, I_{AS}=-22A
3. PulseTest: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%

Typical Characteristics: (T_c=25°C unless otherwise noted)

Figure 1: 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

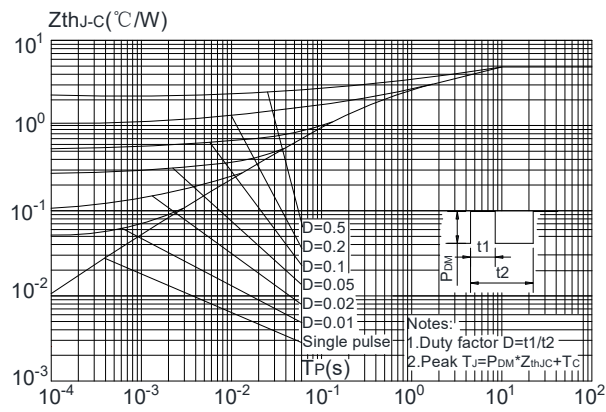


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case