

N-Channel Enhancement Mode MOSFET

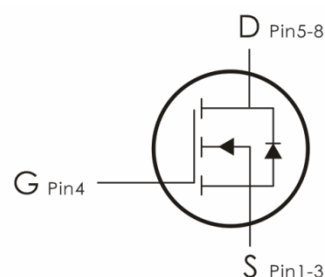
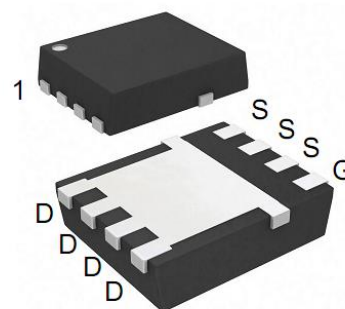
Description:

This N-Channel MOSFET uses advanced SGT 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) $V_{DS}=60V, I_D=55A, R_{DS(on)} < 10m\Omega @ V_{GS}=10V$
- 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: ($T_C=25^\circ C$ 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- $T_C=25^\circ C^1$	55	A
	Pulsed Drain Current ²	138	
E_{AS}	Single Pulse Avalanche Energy ⁴	30	mJ
P_D	Power Dissipation	60	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	2.1	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to ambient	62	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
CSD18534Q5A	D18534	DFN5*6-8

Electrical Characteristics: (T_C=25°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	---	2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =20A	---	7.5	10	m Ω
		V _{GS} =4.5V, I _D =10A	---	10	13	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	1122	---	pF
C _{OSS}	Output Capacitance		---	139	---	
C _{rss}	Reverse Transfer Capacitance		---	3.8	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =50V , V _{GS} =10V , R _G =2 Ω , I _D =10A	---	17.9	---	ns
t _r	Rise Time		---	4	---	ns
t _{d(off)}	Turn-Off Delay Time		---	34.9	---	ns
t _f	Fall Time		---	5.5	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =10A	---	18.4	---	nC
Q _{gs}	Gate-Source Charge		---	3.3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2.8	---	nC
Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _{SD}	Source-Drain Diode Forward Voltage ³	V _{GS} =0V, I _S =20A	---	---	1.3	V
I _S	Diode forward current	V _{GS} <V _{th}	---	---	60	A

I_{SP}	Pulsed source current	$V_{GS} < V_{th}$	---	---	180	A
trr	Continuous Source Current	$I_S = 10\text{ A},$ $di/dt = 100\text{ A}/\mu\text{s}$	---	41.8	---	ns
qrr	Pulsed Source Current		---	36.1	---	nC

Notes:

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4) $V_{DD} = 50\text{ V}$, $R_G = 50\ \Omega$, $L = 0.3\text{ mH}$, starting $T_J = 25\text{ }^\circ\text{C}$.
- 5) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a = 25\text{ }^\circ\text{C}$.

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

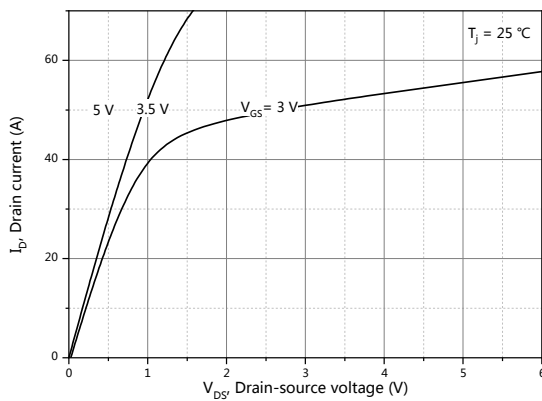


Figure 1, Typ. output characteristics

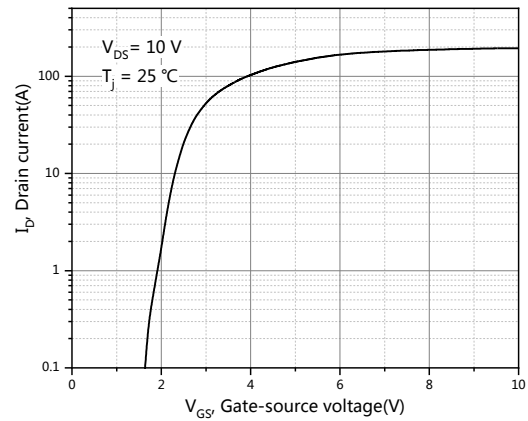


Figure 2, Typ. transfer characteristics

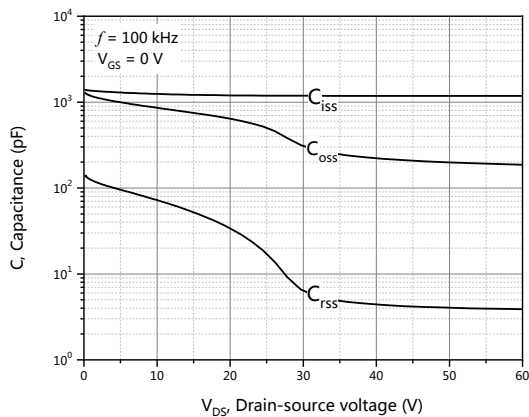


Figure 3, Typ. capacitances

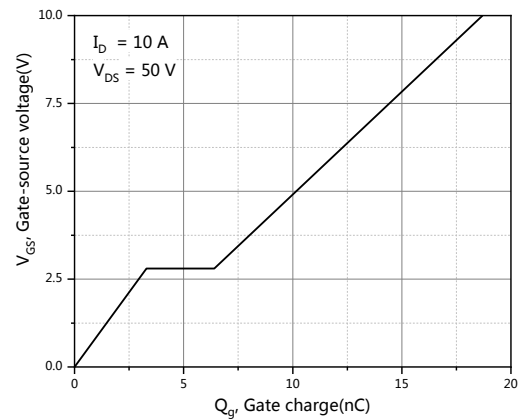


Figure 4, Typ. gate charge

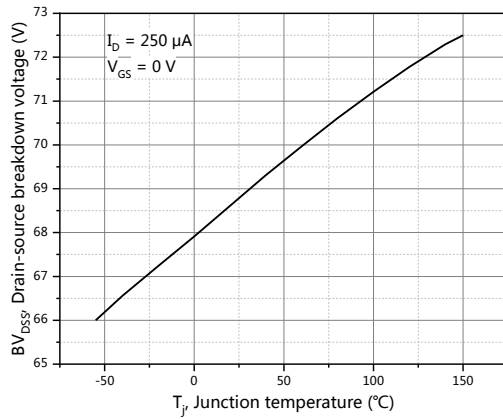


Figure 5, Drain-source breakdown voltage

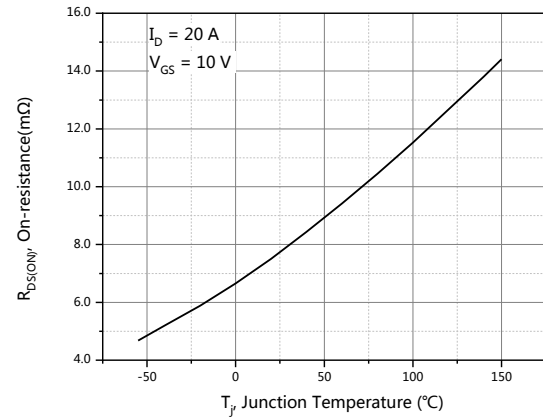


Figure 6, Drain-source on-state resistance

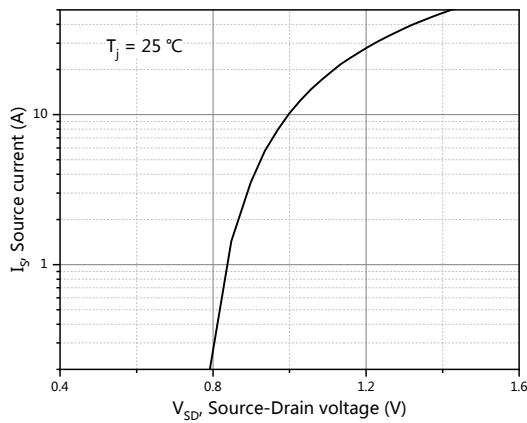


Figure 7, Forward characteristic of body diode

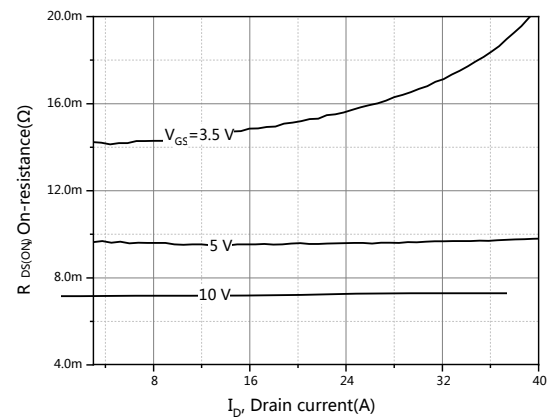


Figure 8, Drain-source on-state resistance

