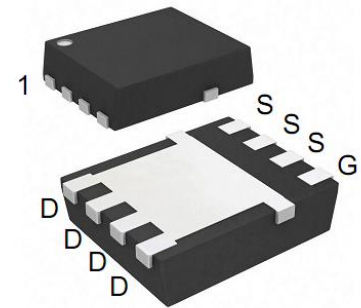


## N-Channel Enhancement Mode MOSFET

### Description:

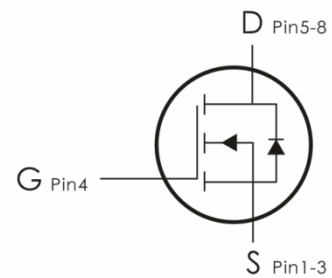
This N-Channel MOSFET uses advanced SGT technology and design to provide excellent  $R_{DS(on)}$  with low gate charge.

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	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C^1$	55	A
	Pulsed Drain Current <sup>2</sup>	138	
$E_{AS}$	Single Pulse Avalanche Energy <sup>4</sup>	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 mbient	62	$^\circ C/W$

### Package Marking and Ordering Information:

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

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	60	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=60V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	---	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=20A$	---	7.5	10	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	10	13	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	1122	---	pF
$C_{oss}$	Output Capacitance		---	139	---	
$C_{rss}$	Reverse Transfer Capacitance		---	3.8	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=2\ \Omega, I_D=10A$	---	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
<b>Drain-Source Diode Characteristics</b>						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
$V_{SD}$	Source-Drain Diode Forward Voltage <sup>3</sup>	$V_{GS}=0V, I_S=20A$	---	---	1.3	V
$I_S$	Diode forward current	$V_{GS}<V_{th}$	---	---	60	A

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

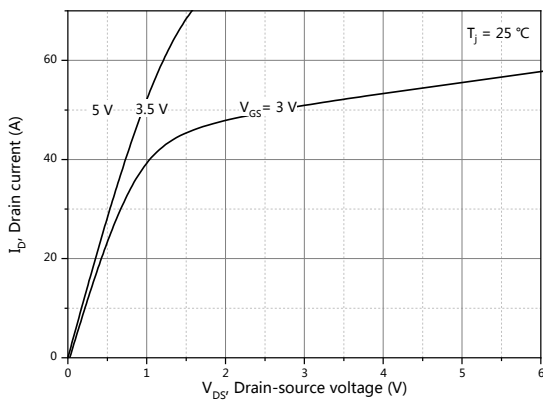


Figure 1, Typ. output characteristics

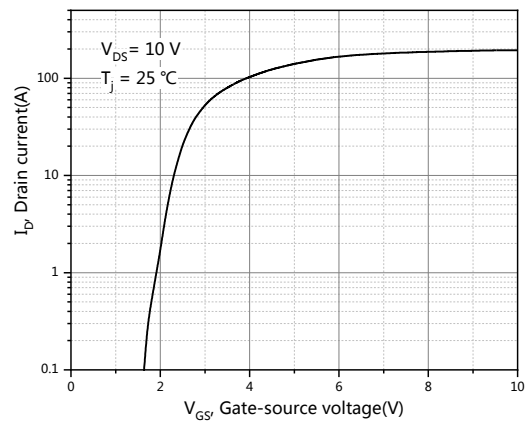


Figure 2, Typ. transfer characteristics

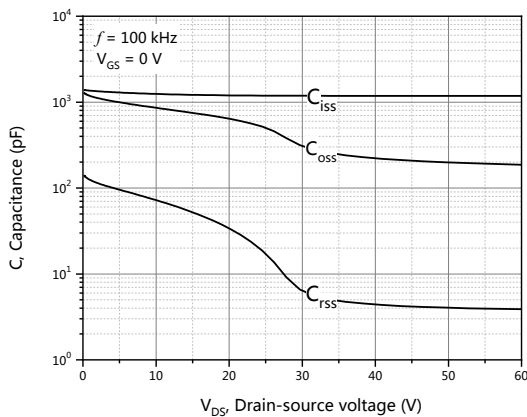


Figure 3, Typ. capacitances

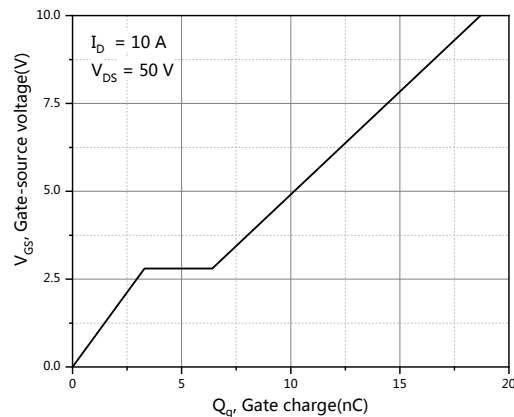


Figure 4, Typ. gate charge

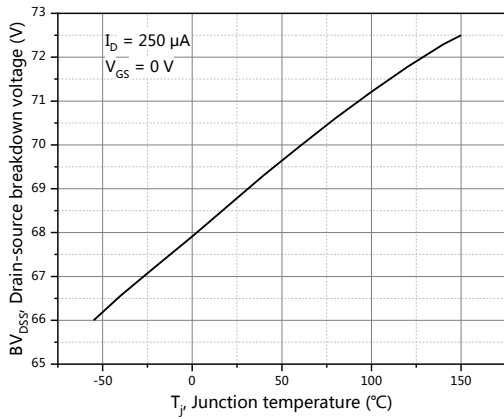


Figure 5, Drain-source breakdown voltage

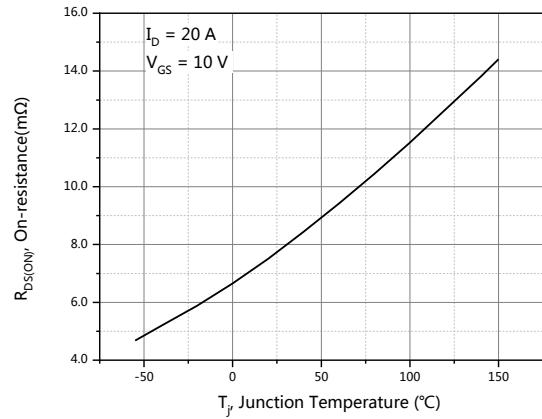


Figure 6, Drain-source on-state resistance

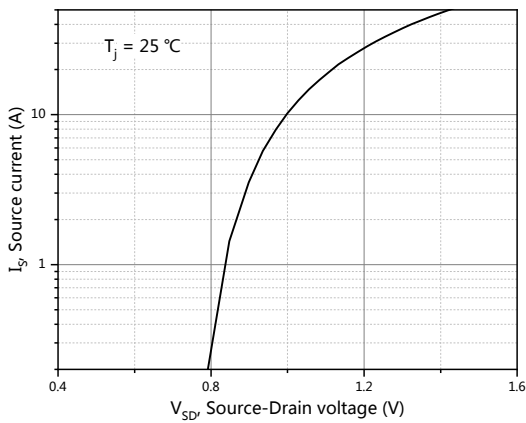


Figure 7, Forward characteristic of body diode

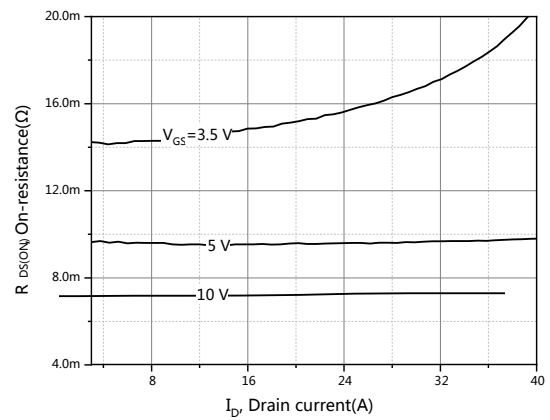


Figure 8, Drain-source on-state resistance

