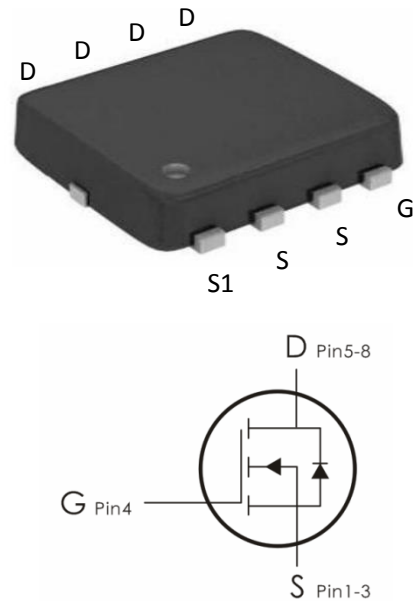


## Description:

This N-Channel MOSFET uses advanced SGT to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

## Features:

- 1)  $V_{DS}=30V, I_D=40A, R_{DS(ON)} < 2.9m\Omega @ V_{GS}=10V$
- 2) Improved dv/dt capability
- 3) Fast switching
- 4) 100% EAS Guaranteed
- 5) Green Device Available.



## 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	$\pm 20$	V
$I_D$	Continuous Drain Current-Continuous ( $T_C=25^\circ C$ ) <sup>1</sup>	40	A
$I_{DM}$	Drain Current – Pulsed	160	A
$E_{AS}$	Single Pulse Avalanche Energy	78	mJ
$I_{AS}$	Avalanche Current	28	A
$P_D$	Power Dissipation ( $T_C=25^\circ C$ )	56.8	W/ $^\circ C$
$T_J, T_{STG}$	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	3.4	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	

## Package Marking and Ordering Information:

Part NO.	Marking	Package
ZC004TG	C004T	DFN3*3-8

## 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	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{GS}=0V, V_{DS}=30V, T_J=25^\circ\text{C}$	---	---	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	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=20A$	---	2.3	2.9	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	---	3.3	4.2	
$G_{FS}$	Forward Transconductance	$V_{DS}=5V, I_D=20A$	---	90	---	S
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	2225	---	pF
$C_{oss}$	Output Capacitance		---	986	---	
$C_{rss}$	Reverse Transfer Capacitance		---	100	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_G=3\ \Omega, I_D=20A$	---	15	---	ns
$t_r$	Rise Time		---	5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	35	---	ns
$t_f$	Fall Time		---	9	---	ns
$Q_g$	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V, I_D=20A$	---	6	---	nC
$Q_{gs}$	Gate-Source Charge		---	5.5	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	29.5	---	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=10A, T_J=25^\circ\text{C}$	---	0.8	---	V

<b>Trr</b>	Reverse Recovery Time	$I_S=20A, V_{GS}=0V,$	---	24	---	nS
			---	30	---	nC
<b>Qrr</b>	Reverse Recovery Charge	$di/dt=100A/\mu S$	---	30	---	nC

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

