

Features

- 1) Low on-resistance
- 2) Fast switching speed
- 3) Fast reverse recovery
- 4) Easy to parallel
- 5) Simple to drive
- 6) Pb-free lead plating ; RoHS compliant

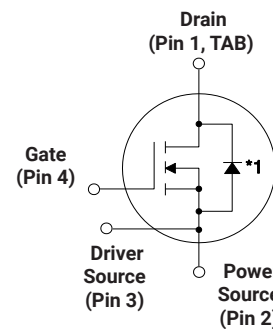
Applications

- Solar inverters
- DC/DC converters
- Switch mode power supplies
- Induction heating



TO-247-4
Package

Inner circuit



- (1) Drain
- (2) Power Source
- (3) Driver Source
- (4) Gate

*1 Body Diode

Part Number	Marking	Package	V_{DS}	$I_D @ 25^\circ C$	$R_{DS(on)}$
GC3M0065100K	GC3M0065100	T0247-4	1000 V	32 A	65 mΩ

Maximum Ratings ($T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions
V_{DSmax}	Drain - Source Voltage	1000	V	$V_{GS} = 0 V, I_D = 100 \mu A$
V_{GSmax}	Gate - Source Voltage (dynamic)	-8/+19	V	AC (f > 1 Hz)
V_{GSop}	Gate - Source Voltage (static)	-4/+15	V	Static
I_D	Continuous Drain Current	32	A	$V_{GS} = 15 V, T_C = 25^\circ C$
		21		$V_{GS} = 15 V, T_C = 100^\circ C$
$I_{D(pulse)}$	Pulsed Drain Current	90	A	Pulse width t_p limited by T_{jmax}
E_{AS}	Avalanche energy, Single pulse	110	mJ	$I_D = 22A, V_{DD} = 50V$
P_D	Power Dissipation	113.5	W	$T_C = 25^\circ C, T_J = 150^\circ C$
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +150	$^\circ C$	
T_L	Solder Temperature	260	$^\circ C$	1.6mm (0.063") from case for 10s

Note (1): When using MOSFET Body Diode $V_{GSmax} = -4V/+19V$

Note (2): MOSFET can also safely operate at 0/+15 V

Electrical Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	1000			V	$V_{GS} = 0\text{ V}, I_D = 100\ \mu\text{A}$
$V_{GS(th)}$	Gate Threshold Voltage	1.8	2.1	3.5	V	$V_{DS} = V_{GS}, I_D = 5\ \text{mA}$
			1.6		V	$V_{DS} = V_{GS}, I_D = 5\ \text{mA}, T_J = 150^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current		1	100	μA	$V_{DS} = 1000\ \text{V}, V_{GS} = 0\ \text{V}$
I_{GSS}	Gate-Source Leakage Current		10	250	nA	$V_{GS} = 15\ \text{V}, V_{DS} = 0\ \text{V}$
$R_{DS(on)}$	Drain-Source On-State Resistance		65	78	m Ω	$V_{GS} = 15\ \text{V}, I_D = 20\ \text{A}$
			95			$V_{GS} = 15\ \text{V}, I_D = 20\ \text{A}, T_J = 150^\circ\text{C}$
g_{fs}	Transconductance		14		S	$V_{DS} = 20\ \text{V}, I_{DS} = 20\ \text{A}$
			12			$V_{DS} = 20\ \text{V}, I_{DS} = 20\ \text{A}, T_J = 150^\circ\text{C}$
C_{iss}	Input Capacitance		760		pF	$V_{GS} = 0\ \text{V}, V_{DS} = 600\ \text{V}$ $f = 1\ \text{MHz}$ $V_{AC} = 25\ \text{mV}$
C_{oss}	Output Capacitance		70			
C_{rss}	Reverse Transfer Capacitance		5			
E_{oss}	C_{oss} Stored Energy		15			
E_{ON}	Turn-On Switching Energy (Body Diode FWD)		127		μJ	$V_{DS} = 700\ \text{V}, V_{GS} = -4\ \text{V}/15\ \text{V}, I_D = 20\ \text{A},$ $R_{G(ext)} = 2.5\ \Omega, L = 130\ \mu\text{H}, T_J = 150^\circ\text{C}$
E_{OFF}	Turn Off Switching Energy (Body Diode FWD)		36			
$t_{d(on)}$	Turn-On Delay Time		7		ns	$V_{DD} = 700\ \text{V}, V_{GS} = -4\ \text{V}/15\ \text{V}$ $I_D = 20\ \text{A}, R_{G(ext)} = 2.5\ \Omega,$ Timing relative to V_{DS} Inductive load
t_r	Rise Time		9			
$t_{d(off)}$	Turn-Off Delay Time		13			
t_f	Fall Time		7			
$R_{G(int)}$	Internal Gate Resistance		3.5		Ω	$f = 1\ \text{MHz}, V_{AC} = 25\ \text{mV}$
Q_{gs}	Gate to Source Charge		9		nC	$V_{DS} = 700\ \text{V}, V_{GS} = -4\ \text{V}/15\ \text{V}$ $I_D = 20\ \text{A}$ Per IEC60747-8-4 pg 21
Q_{gd}	Gate to Drain Charge		16			
Q_g	Total Gate Charge		37			

Reverse Diode Characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	4.5		V	$V_{GS} = -4\ \text{V}, I_{SD} = 10\ \text{A}$
		4.2		V	$V_{GS} = -4\ \text{V}, I_{SD} = 10\ \text{A}, T_J = 150^\circ\text{C}$
I_S	Continuous Diode Forward Current		22	A	$V_{GS} = -4\ \text{V}$
$I_{S, pulse}$	Diode pulse Current		90	A	$V_{GS} = -4\ \text{V},$ pulse width t_p limited by T_{jmax}
t_{rr}	Reverse Recover time	18		ns	$V_{GS} = -4\ \text{V}, I_{SD} = 20\ \text{A}, V_R = 700\ \text{V}$ $\text{dif}/\text{dt} = 4500\ \text{A}/\mu\text{s}, T_J = 150^\circ\text{C}$
Q_{rr}	Reverse Recovery Charge	251		nC	
I_{rrm}	Peak Reverse Recovery Current	24		A	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.94	1.1	$^\circ\text{C}/\text{W}$	
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient		40		

Package Dimensions

Package TO-247-4L

Unit: mm

