

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



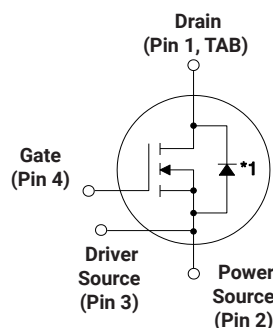
T0-247-4
Package



Applications

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

Inner circuit



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

*1 Body Diode

Part Number	Marking	Package	V_{DS}	$I_D @ 25^\circ C$	$R_{DS(on)}$
GC3M0075120K	GC3M0075120	T0247-4	1200 V	32 A	75 mΩ

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

Symbol	Parameter	Value	Unit	Test Conditions
V_{DSmax}	Drain - Source Voltage	1200	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	$V_{GS} = 15 V, T_C = 25^\circ C$
		23		$V_{GS} = 15 V, T_C = 100^\circ C$
$I_{D(pulse)}$	Pulsed Drain Current	80	A	Pulse width t_p limited by T_{jmax}
P_D	Power Dissipation	136	W	$T_c = 25^\circ C, T_j = 175^\circ C$
T_J, T_{stg}	Operating Junction and Storage Temperature	-40 to +175	$^\circ C$	
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	1200			V	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$
$V_{GS(th)}$	Gate Threshold Voltage	1.8	2.5	3.6	V	$V_{DS} = V_{GS}, I_D = 5\text{ mA}$
			2.2		V	$V_{DS} = V_{GS}, I_D = 5\text{ mA}, T_J = 175^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current		1	50	μA	$V_{DS} = 1200\text{ V}, V_{GS} = 0\text{ V}$
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		75	90	m Ω	$V_{GS} = 15\text{ V}, I_D = 20\text{ A}$
			120			$V_{GS} = 15\text{ V}, I_D = 20\text{ A}, T_J = 175^\circ\text{C}$
g_{fs}	Transconductance		12		S	$V_{DS} = 20\text{ V}, I_{DS} = 20\text{ A}$
			13			$V_{DS} = 20\text{ V}, I_{DS} = 20\text{ A}, T_J = 175^\circ\text{C}$
C_{iss}	Input Capacitance		1396		pF	$V_{GS} = 0\text{ V}, V_{DS} = 1000\text{ V}$ $f = 1\text{ MHz}$ $V_{AC} = 25\text{ mV}$
C_{oss}	Output Capacitance		60			
C_{rss}	Reverse Transfer Capacitance		2			
E_{oss}	C_{oss} Stored Energy		33			
E_{ON}	Turn-On Switching Energy (Body Diode FWD)		270		μJ	$V_{DS} = 800\text{ V}, V_{GS} = -4\text{ V}/15\text{ V}, I_D = 20\text{ A},$ $R_{G(ext)} = 0\text{ }\Omega, L = 156\text{ }\mu\text{H}, T_J = 150^\circ\text{C}$
E_{OFF}	Turn-Off Switching Energy (Body Diode FWD)		77			
$t_{d(on)}$	Turn-On Delay Time		30		ns	$V_{DD} = 800\text{ V}, V_{GS} = -4\text{ V}/15\text{ V}$ $I_D = 20\text{ A}, R_{G(ext)} = 0\text{ }\Omega,$ Timing relative to V_{DS} Inductive load
t_r	Rise Time		14			
$t_{d(off)}$	Turn-Off Delay Time		38			
t_f	Fall Time		10			
$R_{G(int)}$	Internal Gate Resistance		9.0		Ω	$f = 1\text{ MHz}, V_{AC} = 25\text{ mV}$
Q_{gs}	Gate to Source Charge		17		nC	$V_{DS} = 800\text{ V}, V_{GS} = -4\text{ V}/15\text{ V}$ $I_D = 20\text{ A}$ Per IEC60747-8-4 pg 21
Q_{gd}	Gate to Drain Charge		18			
Q_g	Total Gate Charge		53			

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	$V_{GS} = -4\text{ V}, I_{SD} = 10\text{ A}$
		4.0		V	$V_{GS} = -4\text{ V}, I_{SD} = 10\text{ A}, T_J = 175^\circ\text{C}$
I_S	Continuous Diode Forward Current		26	A	$V_{GS} = -4\text{ V}, T_J = 25^\circ\text{C}$
$I_{S, pulse}$	Diode pulse Current	80		A	$V_{GS} = -4\text{ V},$ pulse width t_p limited by T_{jmax}
t_{rr}	Reverse Recover time	20		ns	$V_{GS} = -4\text{ V}, I_{SD} = 20\text{ A}, V_R = 800\text{ V}$ $dif/dt = 3600\text{ A}/\mu\text{s}, T_J = 150^\circ\text{C}$
Q_{rr}	Reverse Recovery Charge	254		nC	
I_{rrm}	Peak Reverse Recovery Current	18		A	

Thermal Characteristics

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

Package Dimensions

Unit: mm

