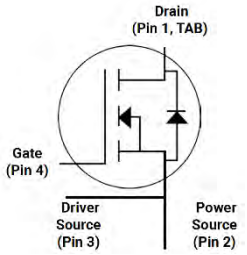
LGE3M35065Q

Silicon Carbide Power MOSFET

V_{DS}	= 650	V
$R_{DS}(on)$	= 35	mΩ
I_D@25°C	= 55	A



TO-247-4L

Pin definition

Features

- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Easy to Parallel and Simple to Drive
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Increased Power Density
- Increased System Switching Frequency

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power applications

Part Number	Package
LGE3M35065Q	**TO-247-4L**

Maximum Ratings (T_c = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{DSmax}	Drain - Source Voltage	650	V	V_{GS}=0V, I_D=100μA	
V_{GSmax}	Gate - Source Voltage	-8/+22	V	Absolute maximum values	
V_{GSop}	Gate - Source Voltage	-5/+18	V	Recommended operational values	
I_D	Continuous Drain Current	60 40	A	V_{GS}=20V, T_C=25°C V_{GS}=20V, T_C=100°C	
I_{DM}	Pulse Drain Current	130	A	Pulse width limited by T_{jmax}	
P_D	Power Dissipation	370	W	T_C=25°C, T_J=175°C	
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	°C		

Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	650			V	V_{GS}=0V,I_D=100μA	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	3.2	4.0	V	V_{GS}= V_{DS}, I_{DS}=5mA,T_C=25°C	Fig. 6
			2.0			V_{GS}= V_{DS}, I_{DS}=5mA,T_C=175C	
I_{DSS}	Zero Gate Voltage Drain Current		2	100	μA	V_{DS}= 650V, V_{GS}=0V	
I_{GSS}	Gate-Source Leakage Current		50	200	nA	V_{GS}=20V, V_{DS}= 0V	
$R_{DS(on)}$	Drain-Source on-state Resistance		35	55	mΩ	V_{GS}=18V, I_D=20A, T_C=25°C	Fig. 4
			50			V_{GS}=18V, I_D=20A, T_C=175°C	
g_{fs}	Transconductance		9.4		S	V_{GS} = 18 V, I_D = 20A, T_J = 25 °C	Fig. 5
			11.9			V_{GS} = 18 V, I_D = 20A,T_J = 175 °C	
Ciss	Input Capacitance		2200		pF	V_{GS}=0V, V_{DS}=1000 V, f=1MHz V_{AC}=25 mV	Fig. 8
Coss	Output Capacitance		240				
Crss	Reverse Transfer Capacitance		30				
E_{ON}	Turn-OnSwitching Energy		1.6		μJ	V_{DS}=400V, V_{GS}=-5/+18V,I_D= 20A, $R_{G(ext)}$ = 5Ω, L= 142 μH	
E_{OFF}	Turn-Off Switching Energy		0.8				
$t_{d(on)}$	Turn-On Delay Time		15		ns	V_{DD}=400V, V_{GS}=-5/18 V , I_D = 20A, $R_{G(ext)}$ = 5 Ω , Timing relative to VDS	
t_r	Rise Time		45				
$t_{d(off)}$	Turn-Off Delay Time		13				
t_f	Fall Time		10				
$R_{G(int)}$	Internal Gate Resistance		1.5		Ω	f=1 MHz, V_{AC}=25mV	
Q_{gs}	Gate to Source Charge		30		nC	V_{DD}=400V, V_{GS}=-5/18 V I_D = 20A	Fig. 9
Q_{gd}	Gate to Drain Charge		20				
Q_g	Total Gate Charge		70				

Reverse Diode Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode Forward Voltage	5.5		V	V_{GS} =-5V, I_{SD} = 15 A, T_J = 25 ℃	Fig. 7
		5.2		V	V_{GS} =-5V, I_{SD} = 15 A, T_J = 175 ℃	
I_S	Continuous Diode Forward Current		60	A	T_C = 25°C	
t_{rr}	Reverse Recovery time	30		ns	V_{GS} =-5V, I_{SD} = 15 A, V_R= 400V, dif/dt=1200A/μs;	
Q_{rr}	Reverse Recovery Charge	120		nC		
I_{rrm}	Peak Reverse Recovery Current	10		A		

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.40	℃/W		Fig. 11
$R_{\theta JA}$	Thermal Resistance From Junction to Ambient	35			

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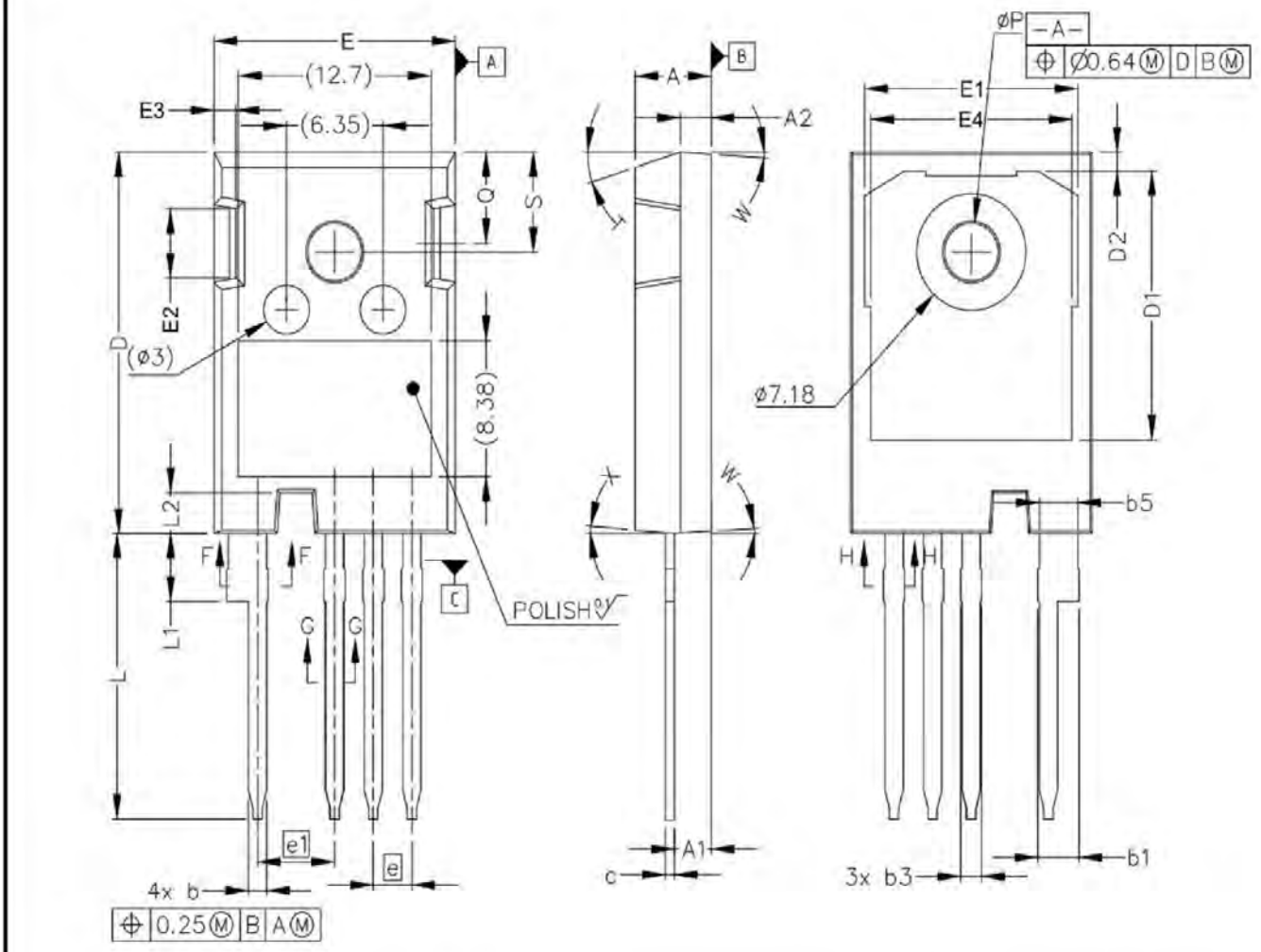
Package Dimensions: TO-247-4L



SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX						MIN	NOM	MAX
A	4.83	5.00	5.21	D	23.30	23.45	23.60	L1	3.97	4.13	4.37
A1	2.29	2.41	2.54	D1	16.25	16.55	17.65	ø P	3.51	3.6	3.65
A2	1.91	2.00	2.16	E	15.75	15.90	16.13	W	-	3.5	-
b	1.07	1.20	1.33	E1	13.10	13.65	14.15	X	-	4	-
b1	2.39	2.60	2.94	E2	3.68	5.0	5.1	Q	5.49	5.8	6.0
b2	2.39	-	2.84	e		2.54		S	6.04	6.15	6.30
c	0.55	0.60	0.68	L	17.31	17.45	17.82	T	-	17.5	-

NOTE:
1The plastic package is not marked as smooth surfaceRa=0.1;Subglossy surfaceRa=0.8
2.Undeclared tolerance ±0.15,Unmarked filletRmax=0.25

NAME	TO-247-4L OUTLINE	UNIT	mm	DESIGNED	Shawn	THIRD ANGLE SYSTEM
DWGNO		PAGE	1 OF 1	CHECKED		
VERSION	Ver1.0	ISSUE DATE		APPROVED		