ShinDengen

P24LF4QMK

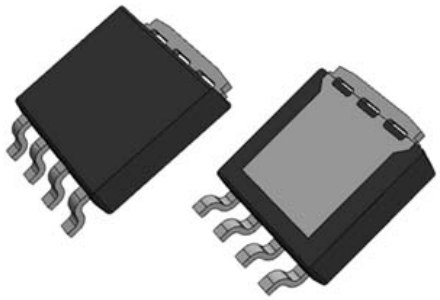
Power MOSFETs
40V, 24A, N-channel

Feature

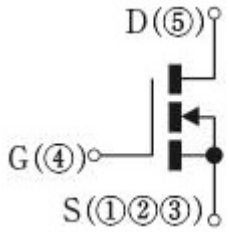
- N-channel
- Small SMD
- Low Ron
- Low Vth
- Low Capacitance
- Based on AEC-Q101
- Halogen free
- Pb free terminal
- RoHS:Yes

OUTLINE

Package (House Name): LF
Package (JEDEC Code): MO-235B similar



Equivalent circuit



Absolute Maximum Ratings (unless otherwise specified : Tc=25℃)

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 175	℃
Channel tempertature	Tch		-55 to 175	℃
Drain-source voltage	V_{DSS}		40	V
Gate-source voltage	V_{GSS}		±20	V
Continuous drain current(DC)	I_D		24	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, duty=1/100	72	A
Total power dissipation	P_T		50	W
Single avalanche current	I_{AS}	Starting Tch=25℃ Tch≦150℃	13	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	19	mJ

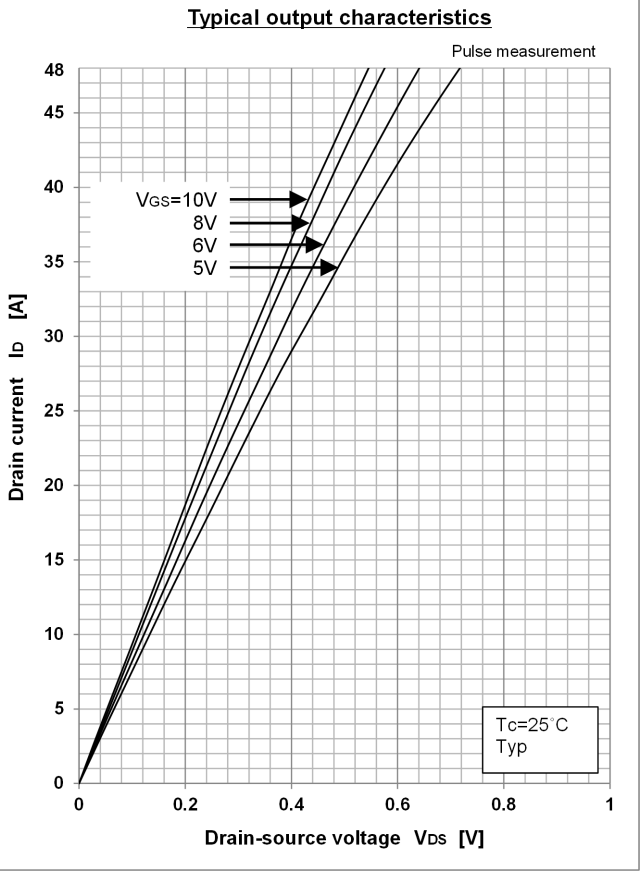
※ ：See the original Specifications

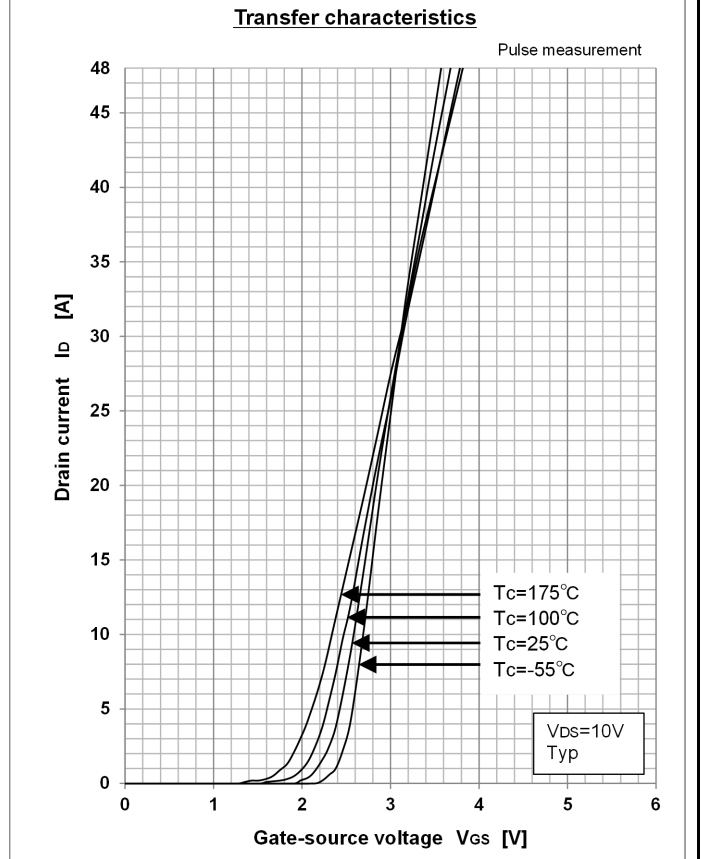
Electrical Characteristics (unless otherwise specified : Tc=25°C)

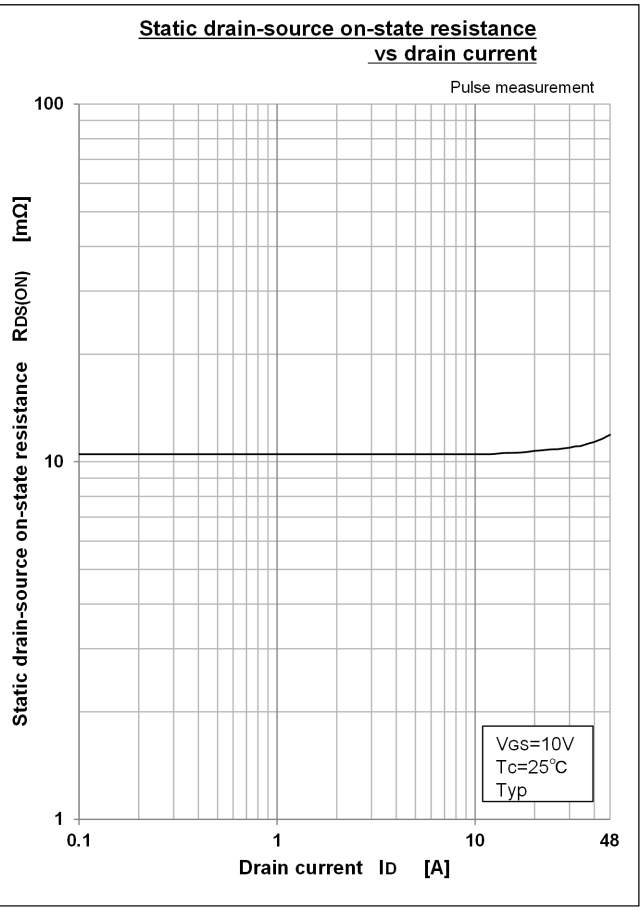
Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	40			V
Zero gate voltage drain current	I_{DSS}	VDS=40V, VGS=0V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=12A, VDS=10V	6			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=12A, VGS=10V		0.0105	0.0132	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=10A, VGS=4V		0.0154	0.022	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	1.2	1.6	2	V
Source-drain diode forward voltage	V_{SD}	IS=24A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink			3	°C/W
Total gate charge	Qg	VDD=32V, VGS=10V, ID=24A		22		nC
Gate to source charge	Qgs	VDD=32V, VGS=10V, ID=24A		4.5		nC
Gate to drain charge	Qgd	VDD=32V, VGS=10V, ID=24A		5		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		856		pF
Reverce transfer capacitnce	Crss	VDS=25V, VGS=0V, f=1MHz		63		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		129		pF
Turn-on delay time	td(on)	ID=12A, RL=1.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		3		ns
Rise time	tr	ID=12A, RL=1.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		7		ns
Turn-off delay time	td(off)	ID=12A, RL=1.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		14		ns
Fall time	tf	ID=12A, RL=1.67Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		4.5		ns
Diode reverse recovery time	trr	IF=24A, VGS=0V, di/dt=100A/μs		32		ns
Diode reverse recovery charge	Qrr	IF=24A, VGS=0V, di/dt=100A/μs		26		nC

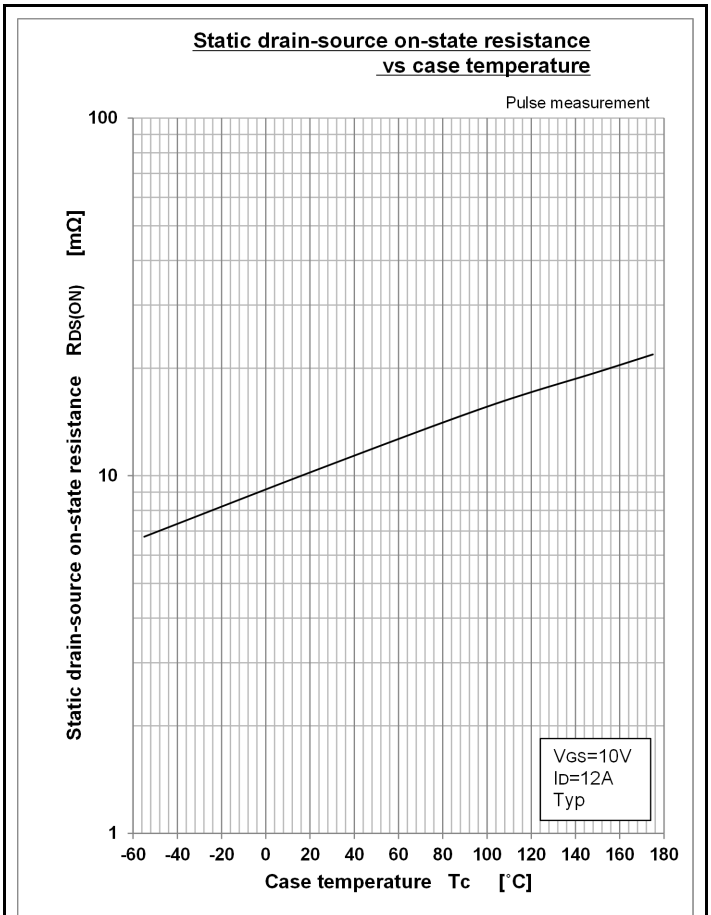
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

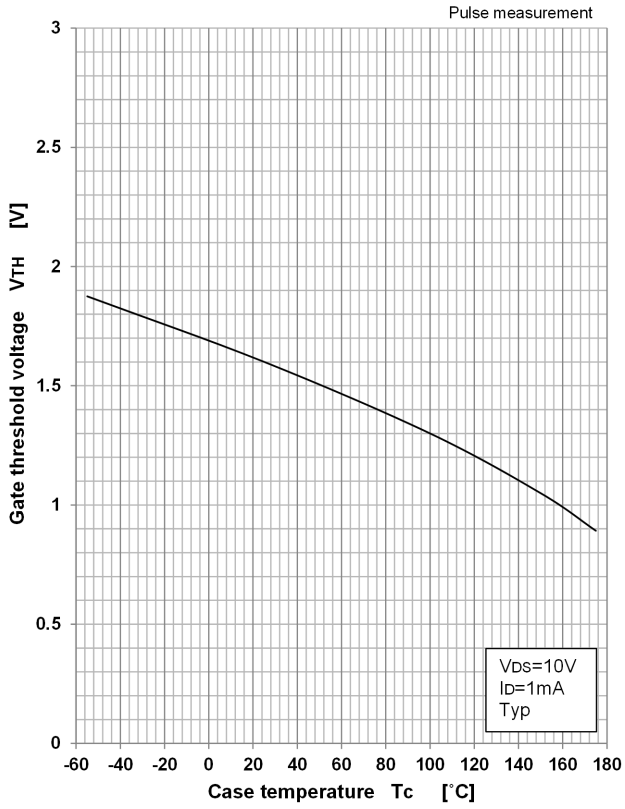




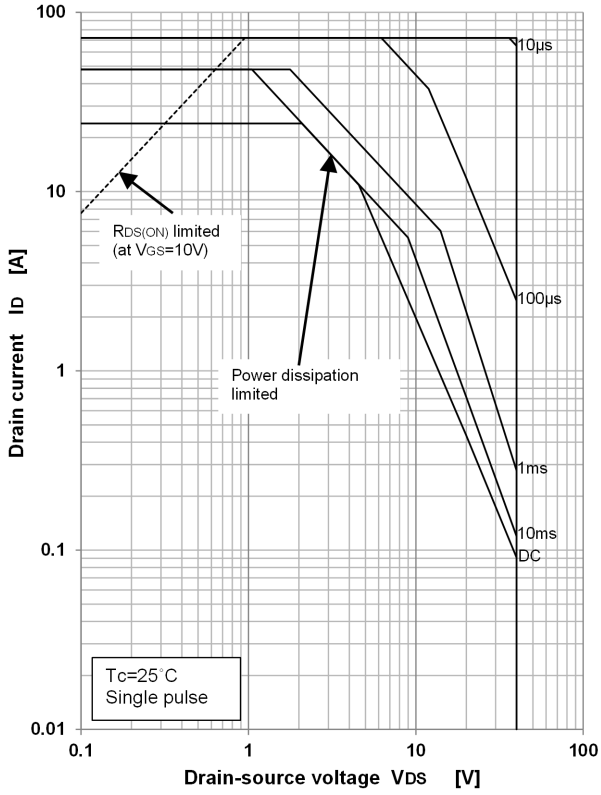


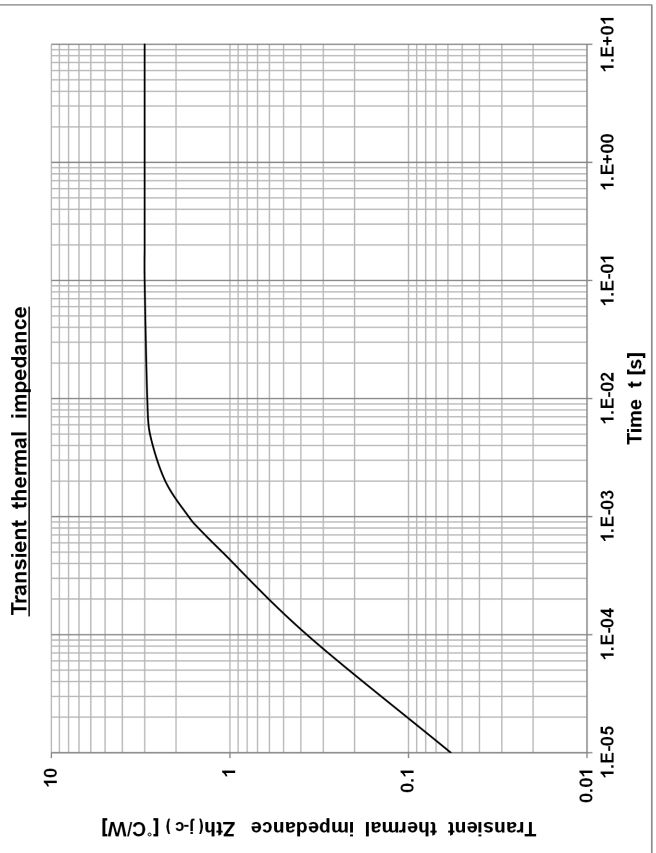


Gate threshold voltage vs case temperature

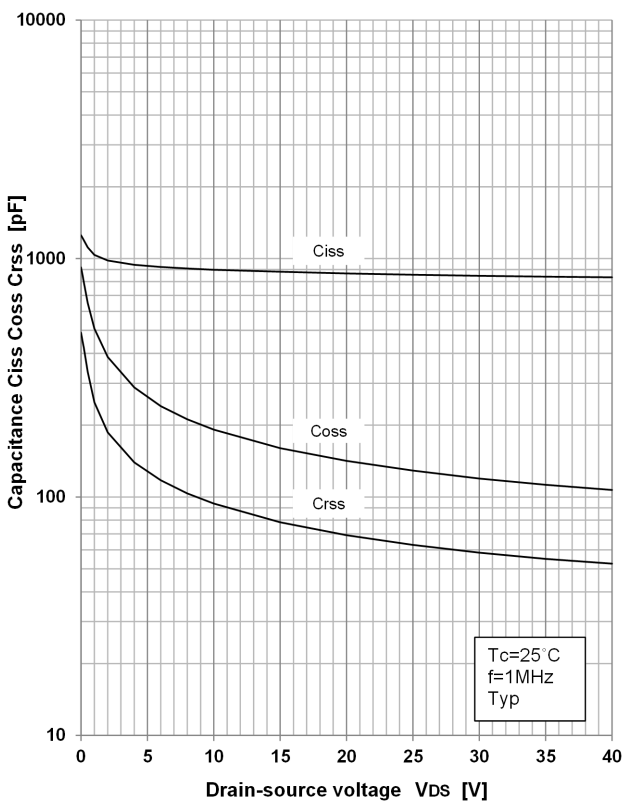


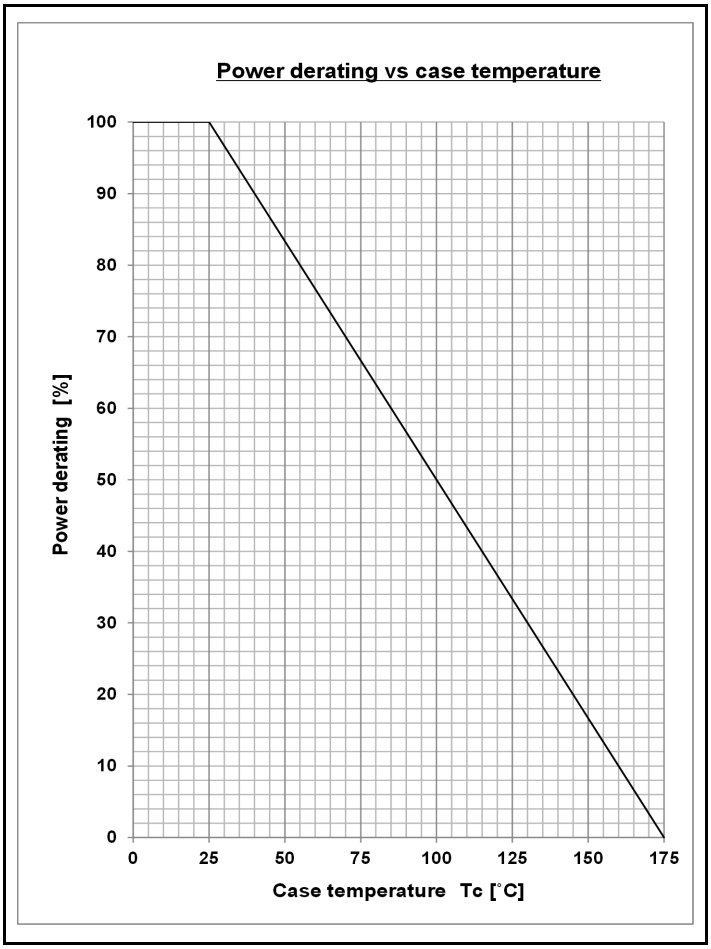
Safe operating area

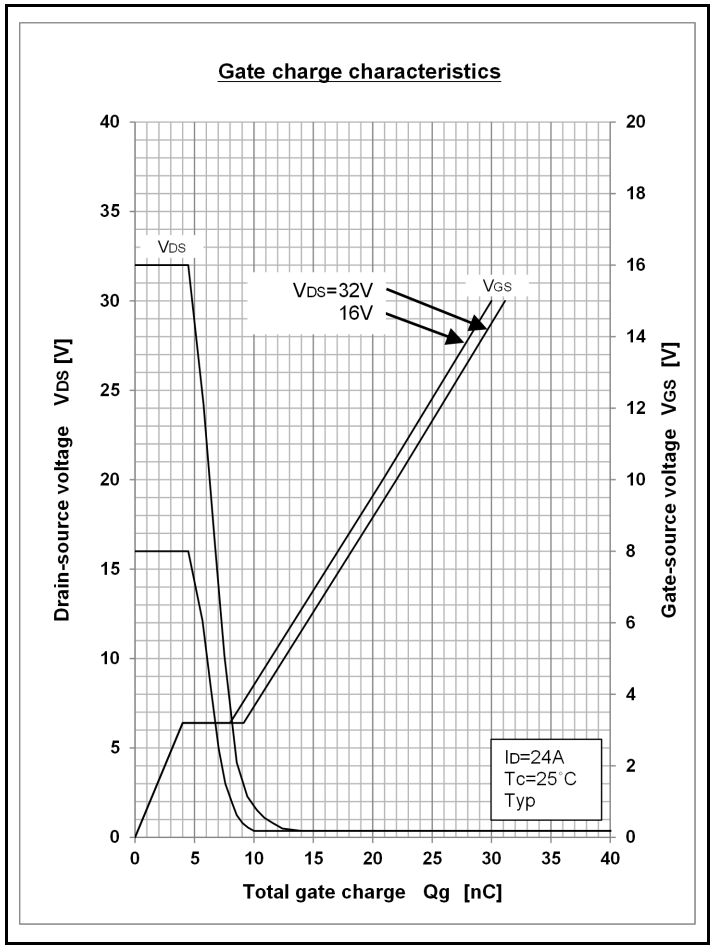


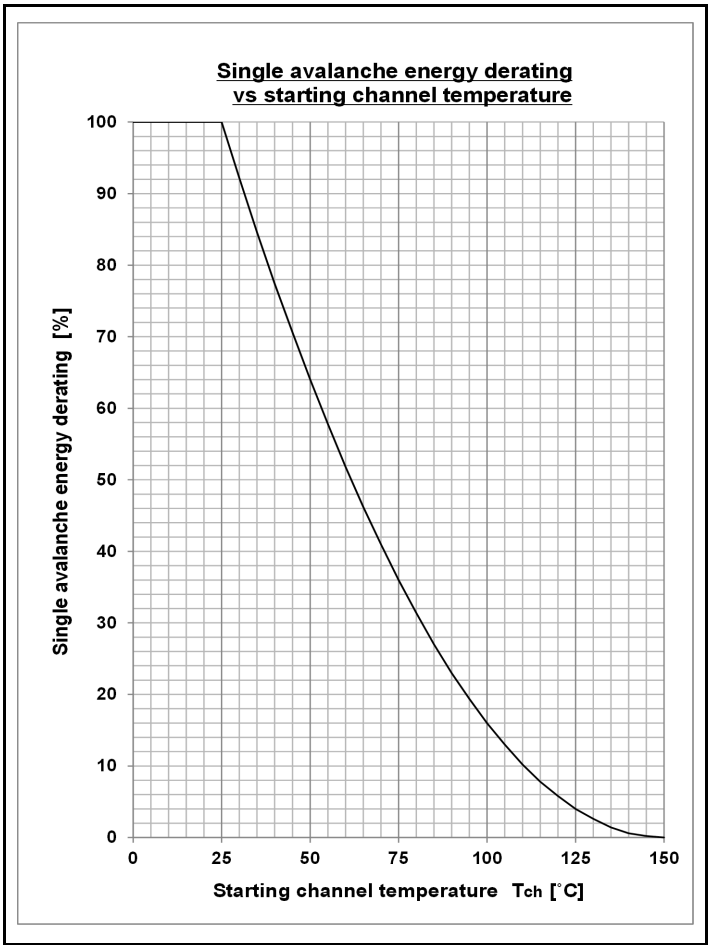


Capacitance characteristics




Power derating vs case temperature
Power derating [%]
Case temperature Tc [°C]
0
10
20
30
40
50
60
70
80
90
100
0
25
50
75
100
125
150
175


Gate charge characteristics
Drain-source voltage VDS [V]
Gate-source voltage VGS [V]
Total gate charge Qg [nC]
VDS
VDS=32V
16V
VGS
ID=24A
Tc=25°C
Typ
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
0
5
10
15
20
25
30
35
40

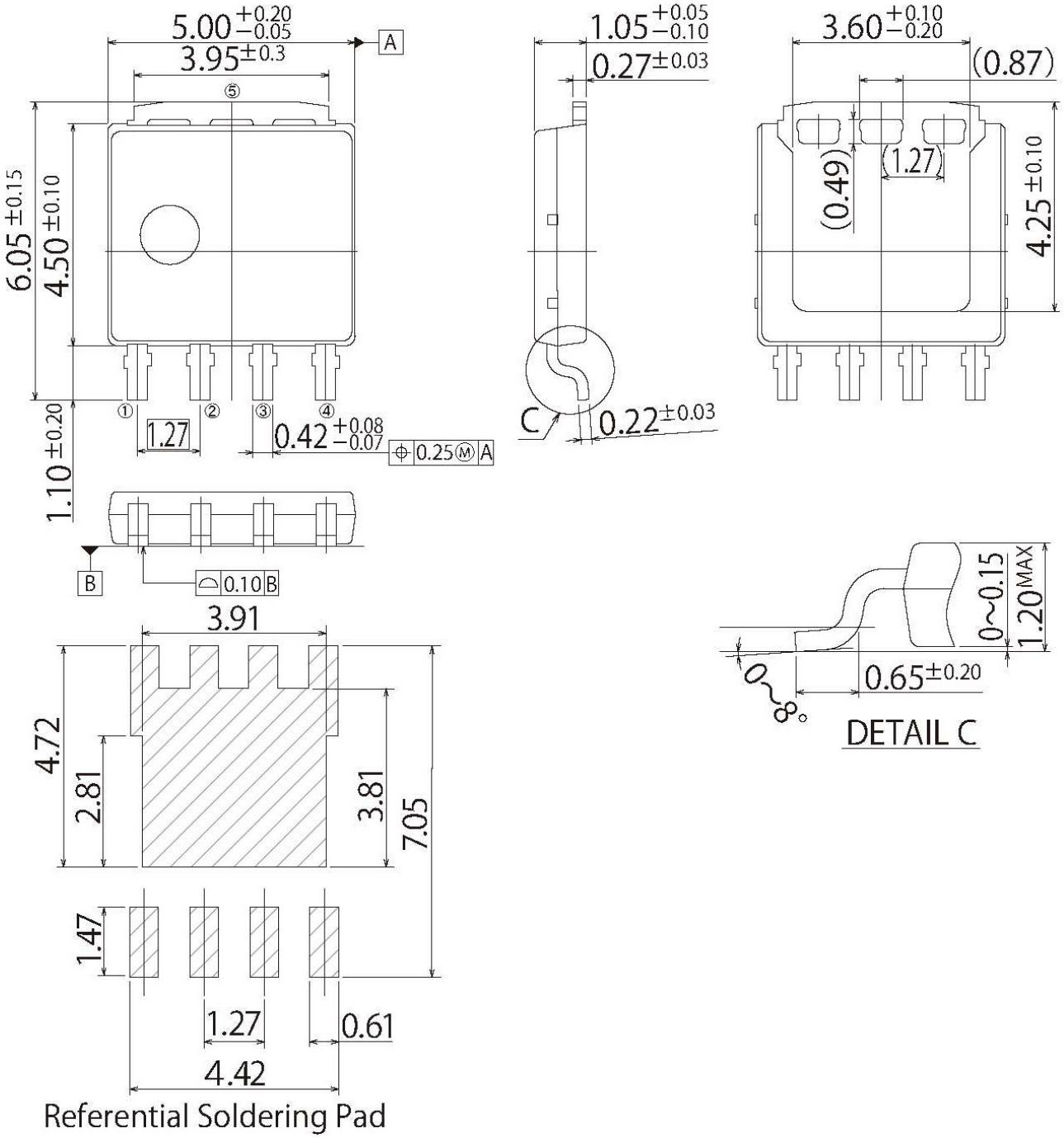

Single avalanche energy derating
vs starting channel temperature
Single avalanche energy derating [%]
Starting channel temperature Tch [°C]
0
10
20
30
40
50
60
70
80
90
100
0
25
50
75
100
125
150

Outline Dimensions

unit:mm

G7

JEDEC Code	MO-235B similar
JEITA Code	–
House Name	LF



Notes

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