ShinDengen

P46LF7R5SNK

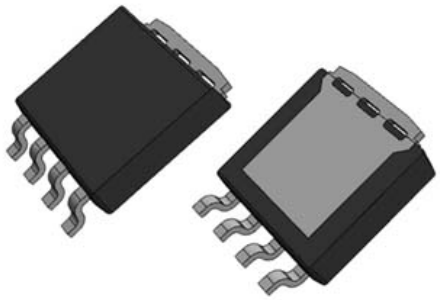
Power MOSFETs
75V, 46A, N-channel

Feature

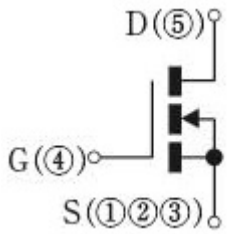
- N-channel
- Small SMD
- Large Current
- Low Ron
- 10V Gate Drive
- Low Capacitance
- Based on AEC-Q101
- Halogen free
- Pb free terminal
- RoHS:Yes

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}		75	V
Gate-source voltage	V_{GSS}		±20	V
Continuous drain current(DC)	I_D		46	A
Continuous drain current(Peak)	I_{DP}	Pulse width 10μs, duty=1/100	138	A
Total power dissipation	P_T		168	W
Single avalanche current	I_{AS}	Starting Tch=25℃ Tch≦150℃	28	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	88	mJ

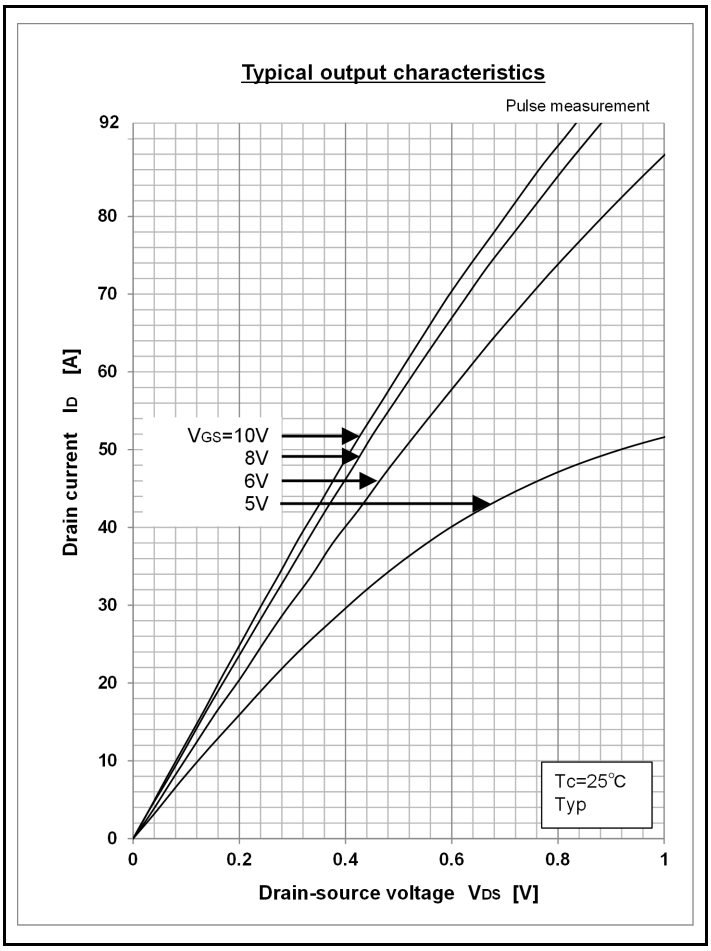
※ ：See the original Specifications

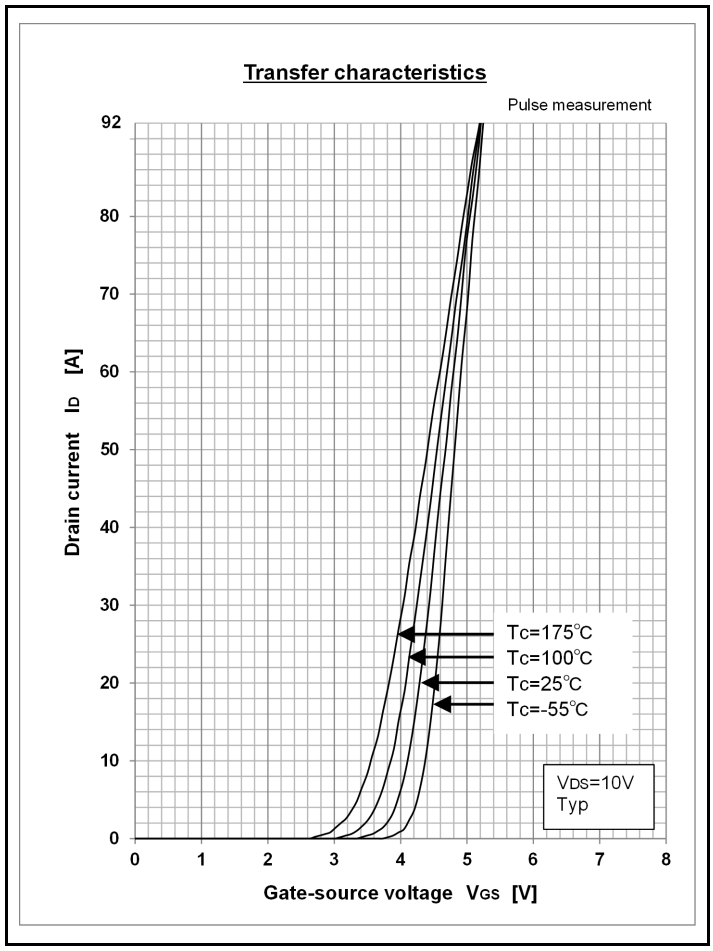
Electrical Characteristics (unless otherwise specified : Tc=25℃)

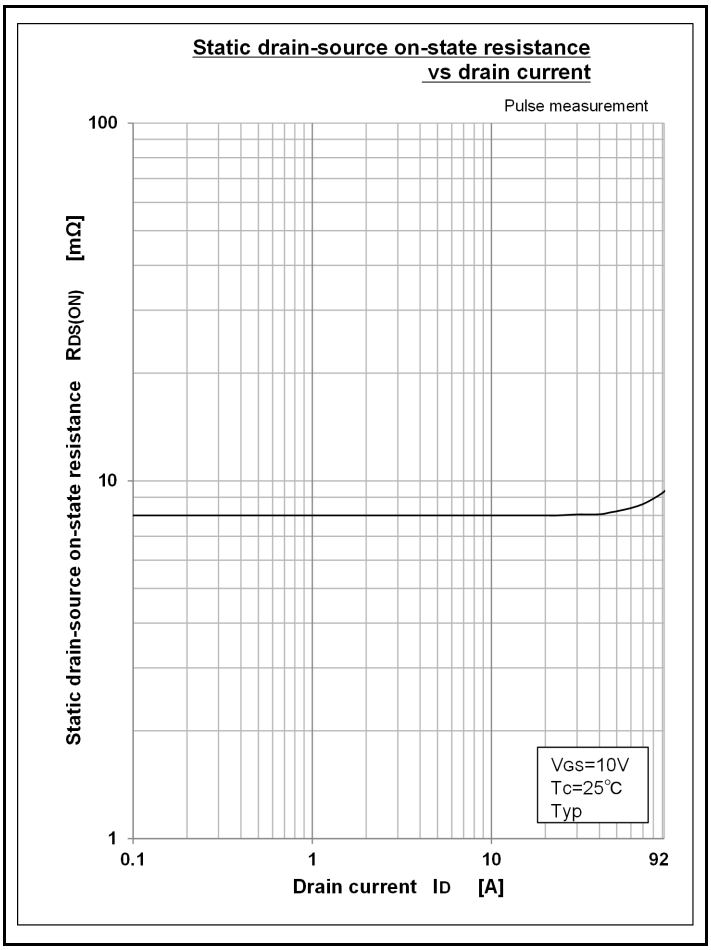
Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	75			V
Zero gate voltage drain current	I_{DSS}	VDS=75V, VGS=0V			1	μA
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	g_{fs}	ID=23A, VDS=10V	10			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=23A, VGS=10V		0.008	0.01	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	2	3	4	V
Source-drain diode forward voltage	V_{SD}	IS=46A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink			0.89	℃/W
Total gate charge	Qg	VDD=60V, VGS=10V, ID=46A		48		nC
Gate to source charge	Qgs	VDD=60V, VGS=10V, ID=46A		13.5		nC
Gate to drain charge	Qgd	VDD=60V, VGS=10V, ID=46A		17		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		2380		pF
Reverce transfer capacitnce	Crss	VDS=25V, VGS=0V, f=1MHz		132		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		272		pF
Turn-on delay time	td(on)	ID=23A, RL=1.63Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		5.7		ns
Rise time	tr	ID=23A, RL=1.63Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		10.5		ns
Turn-off delay time	td(off)	ID=23A, RL=1.63Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		29		ns
Fall time	tf	ID=23A, RL=1.63Ω, VDD=37.5V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		10.5		ns
Diode reverse recovery time	trr	IF=46A, VGS=0V, di/dt=100A/μs		46		ns
Diode reverse recovery charge	Qrr	IF=46A, VGS=0V, di/dt=100A/μs		67		nC

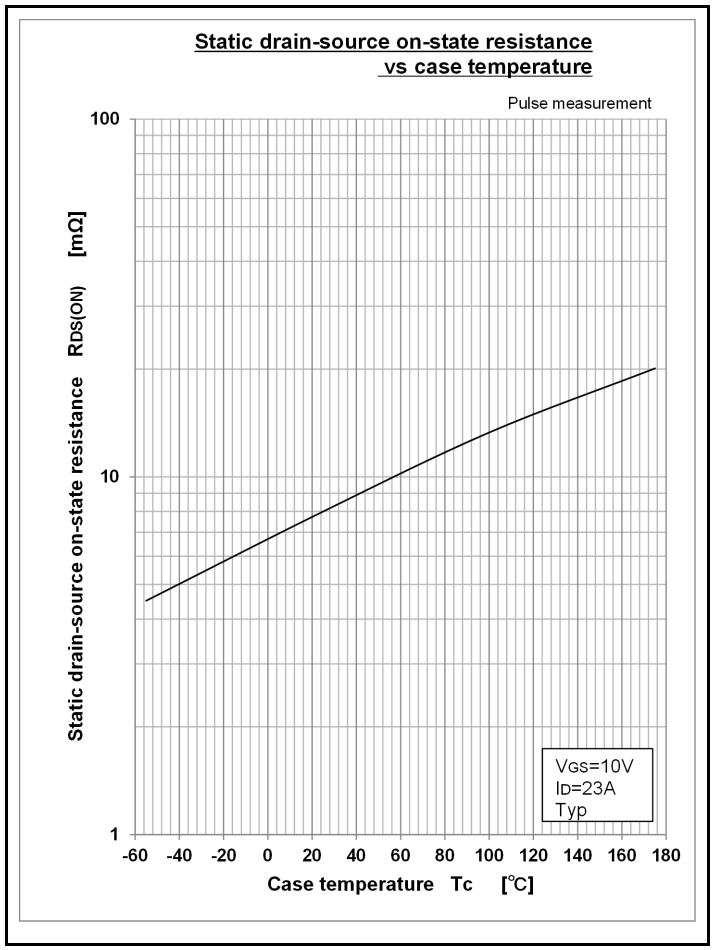
※ ：See the original Specifications

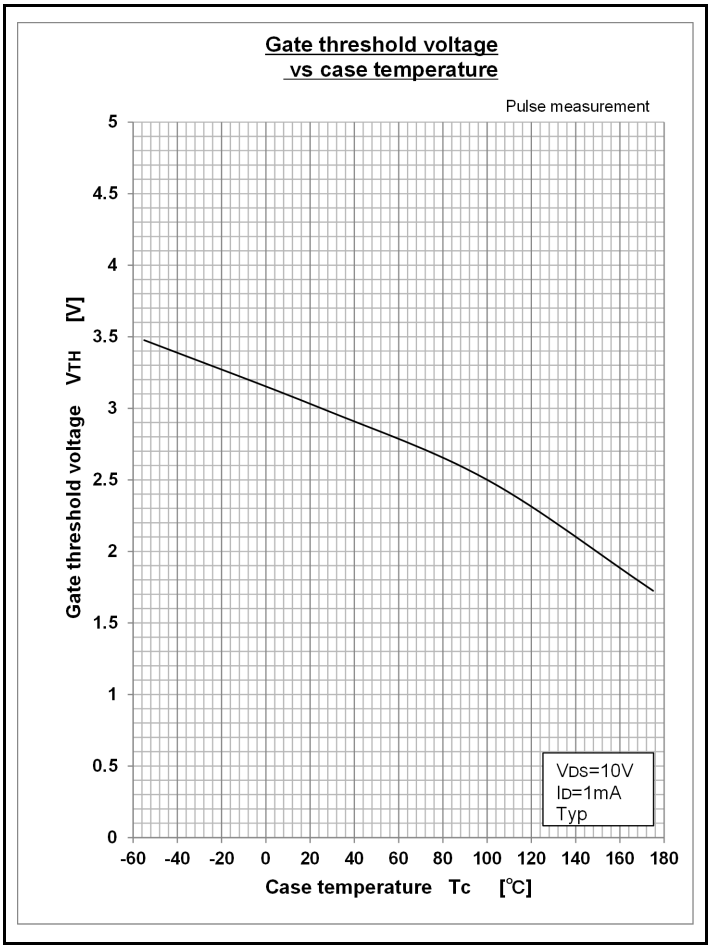
CHARACTERISTIC DIAGRAMS

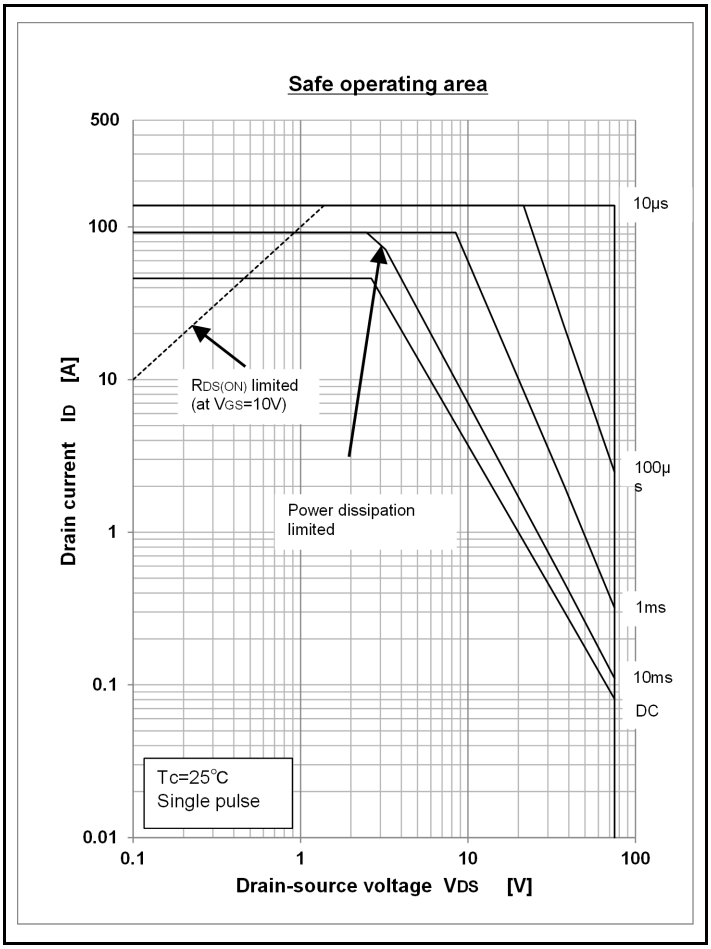


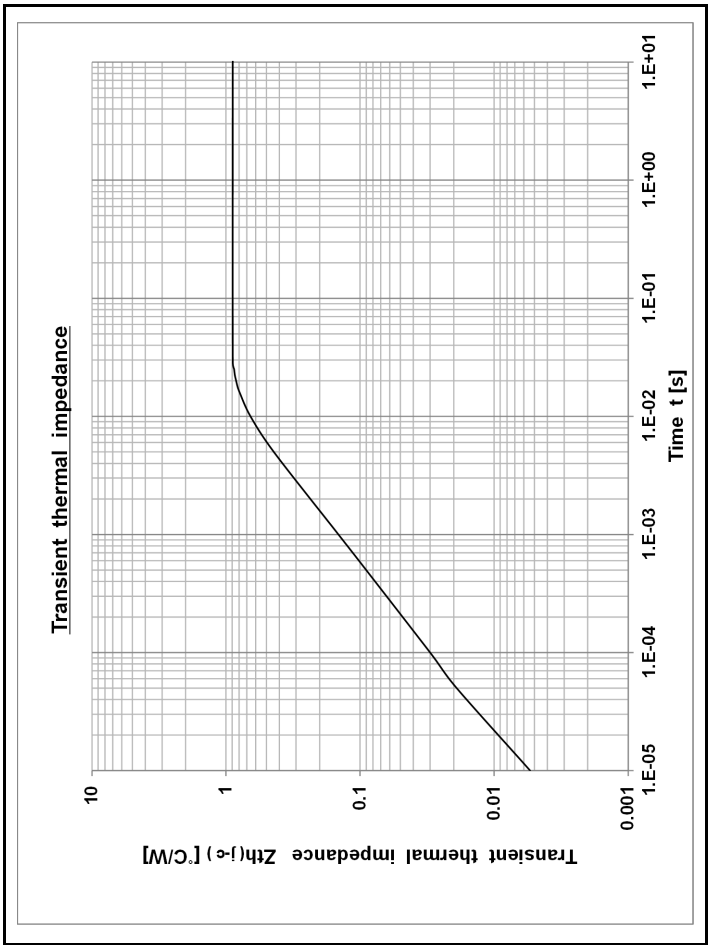


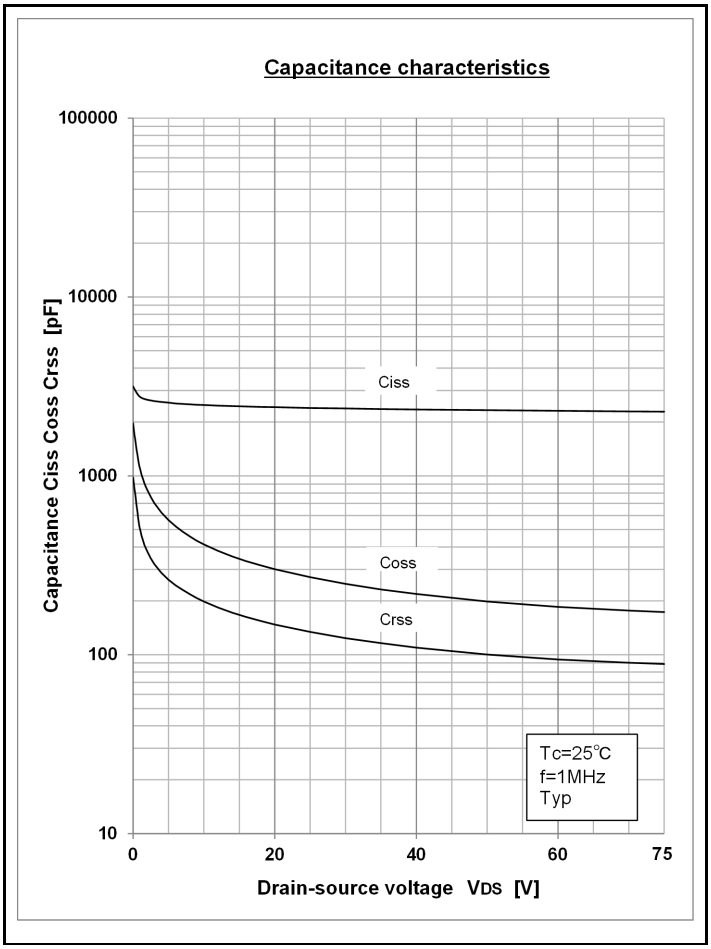


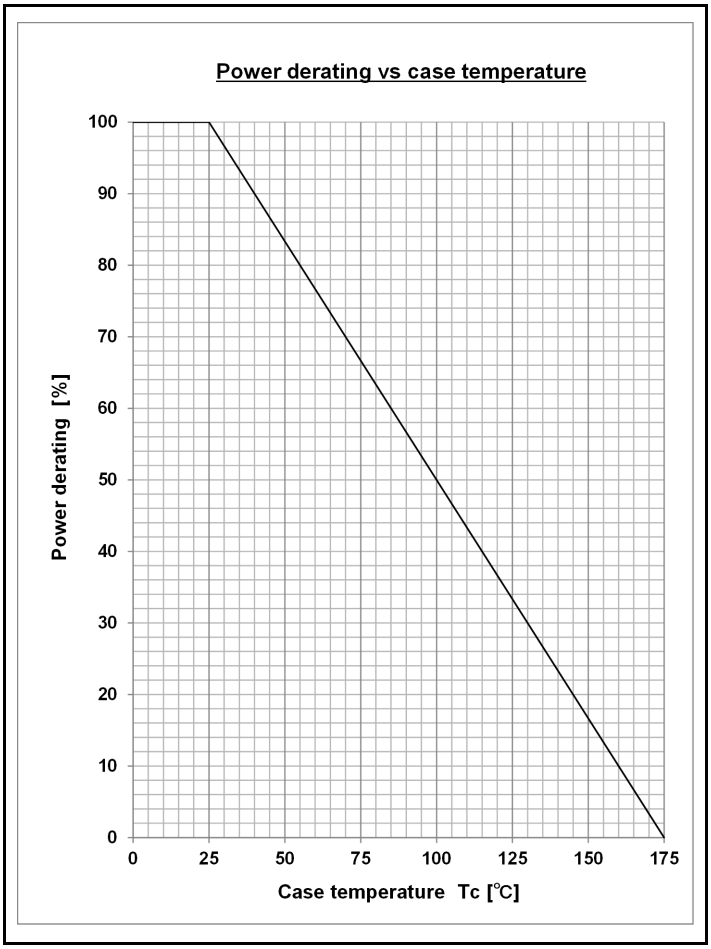


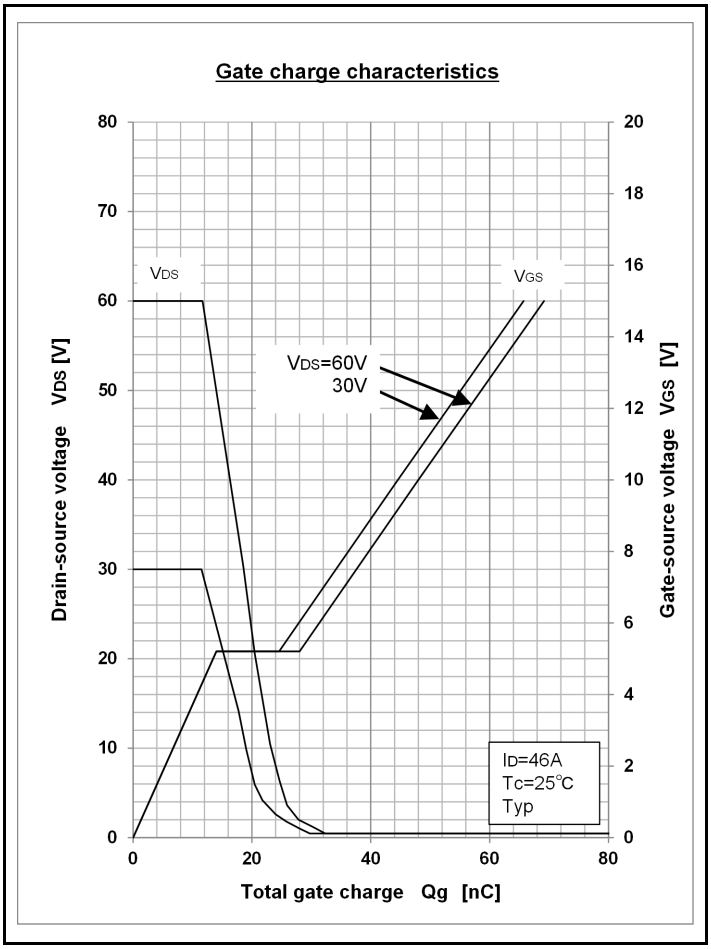

Gate threshold voltage
vs case temperature
Pulse measurement
Gate threshold voltage VTH [V]
Case temperature Tc [℃]
VDS=10V
ID=1mA
Typ

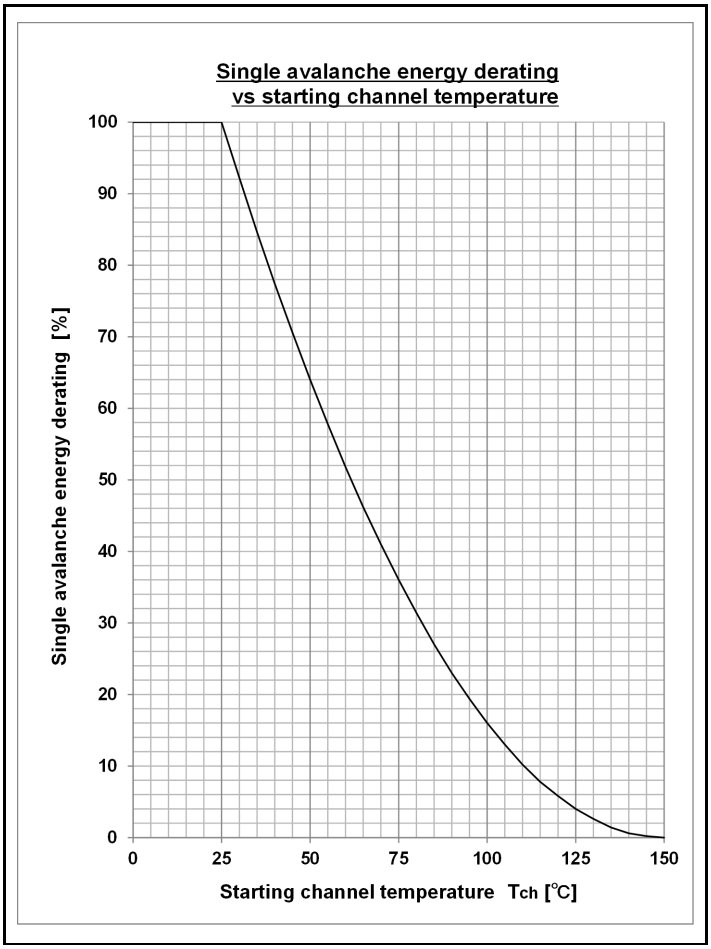

Safe operating area
Drain current ID [A]
Drain-source voltage VDS [V]
RDS(ON) limited
(at VGS=10V)
Power dissipation
limited
10μs
100μs
1ms
10ms
DC
Tc=25℃
Single pulse


Transient thermal impedance
Time t [s]
Transient thermal impedance Zth(j-c) [℃/W]


Capacitance characteristics
Capacitance Ciss Coss Crss [pF]
Drain-source voltage VDS [V]
Ciss
Coss
Crss
Tc=25℃
f=1MHz
Typ


Power derating vs case temperature
Power derating [%]
Case temperature Tc [℃]
100
90
80
70
60
50
40
30
20
10
0
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
VGS
VDS=60V
30V
ID=46A
Tc=25℃
Typ
80
70
60
50
40
30
20
10
0
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80

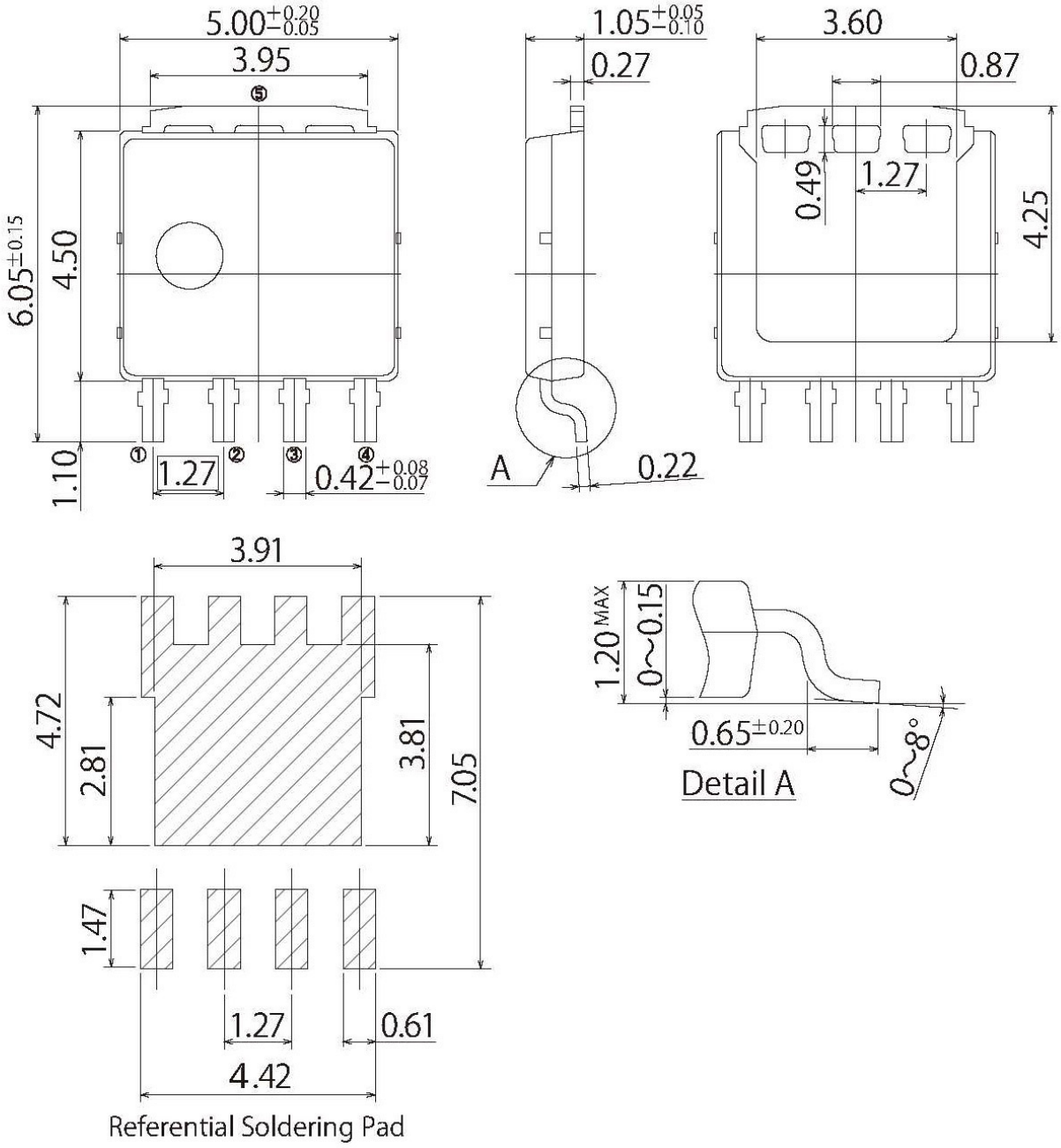

Single avalanche energy derating
vs starting channel temperature
Single avalanche energy derating [%]
Starting channel temperature Tch [℃]
100
90
80
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150

Outline Dimensions

unit:mm

G7

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



• Optimize soldering pad to the board design and soldering condition.

Notes

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   【Special applications】
   Transportation equipment (vehicles, ships, etc.), trunk-line communication equipment, traffic signal control systems, anti-disaster/crime systems, safety equipment, medical equipment, etc.
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   Nuclear reactor control systems, aircraft, aerospace equipment, submarine repeaters, life support equipment and systems, etc.
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