

# P40LF12SN

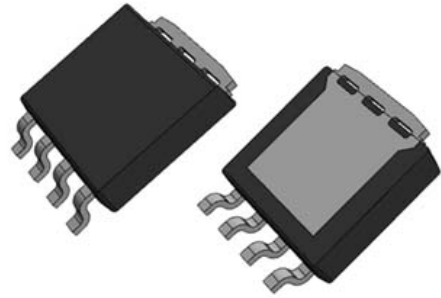
Power MOSFETs  
120V, 40A, N-channel

### Feature

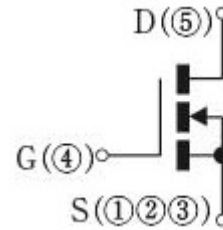
- N-channel
- Small SMD
- Large Current
- Low Ron
- 10V Gate Drive
- Low Capacitance
- Halogen free
- Pb free terminal
- RoHS:Yes

### OUTLINE

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



### Equivalent circuit



### Absolute Maximum Ratings (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 175	°C
Channel temperature	Tch		-55 to 175	°C
Drain-source voltage	V <sub>DSS</sub>		120	V
Gate-source voltage	V <sub>GSS</sub>		±20	V
Continuous drain current(DC)	I <sub>D</sub>		40	A
Continuous drain current(Peak)	I <sub>DP</sub>	Pulse width 10μs, duty=1/100	160	A
Total power dissipation	P <sub>T</sub>		217	W
Single avalanche current	I <sub>AS</sub>	Starting Tch=25°C Tch≤150°C	30	A
Single avalanche energy	E <sub>AS</sub>	Starting Tch=25°C Tch≤150°C	109	mJ

\* : See the original Specifications

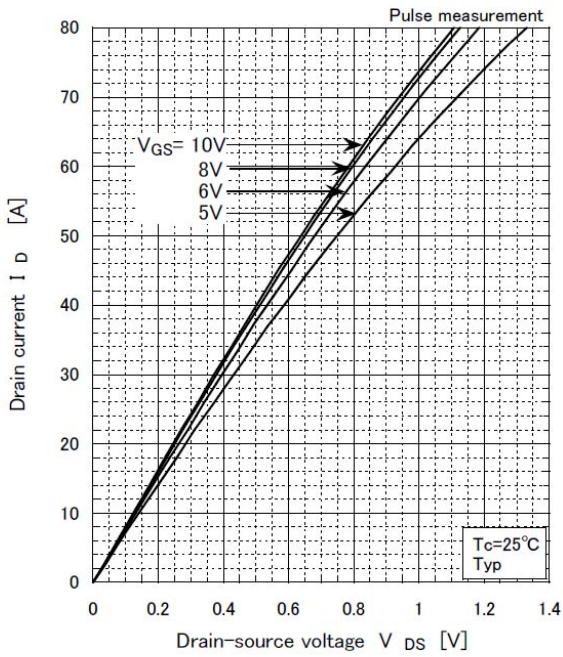
**Electrical Characteristics** (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	120			V
Zero gate voltage drain current	$I_{DSS}$	VDS=120V, VGS=0V			1	μA
Gate-source leakage current	$I_{GSS}$	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	$g_{fs}$	ID=20A, VDS=10V	15			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=20A, VGS=10V		0.0123	0.0154	Ω
Gate threshold voltage	$V_{th}$	ID=1mA, VDS=10V	2	3	4	V
Source-drain diode forward voltage	$V_{SD}$	IS=40A, VGS=0V			1.5	V
Thermal resistance	$R_{th(j-c)}$	Junction to case, with heatsink			0.69	°C/W
Total gate charge	$Q_g$	VDD=96V, VGS=10V, ID=40A		80		nC
Gate to source charge	$Q_{gs}$	VDD=96V, VGS=10V, ID=40A		20		nC
Gate to drain charge	$Q_{gd}$	VDD=96V, VGS=10V, ID=40A		26		nC
Input capacitance	$C_{iss}$	VDS=25V, VGS=0V, f=1MHz		4075		pF
Reverse transfer capacitance	$C_{rss}$	VDS=25V, VGS=0V, f=1MHz		153		pF
Output capacitance	$C_{oss}$	VDS=25V, VGS=0V, f=1MHz		326		pF
Turn-on delay time	$t_{d(on)}$	ID=20A, RL=3.0Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		6.5		ns
Rise time	$t_r$	ID=20A, RL=3.0Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		10		ns
Turn-off delay time	$t_{d(off)}$	ID=20A, RL=3.0Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		64		ns
Fall time	$t_f$	ID=20A, RL=3.0Ω, VDD=60V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		25		ns
Diode reverse recovery time	$t_{rr}$	IF=40A, VGS=0V, di/dt=100A/μs		62		ns
Diode reverse recovery charge	$Q_{rr}$	IF=40A, VGS=0V, di/dt=100A/μs		143		nC

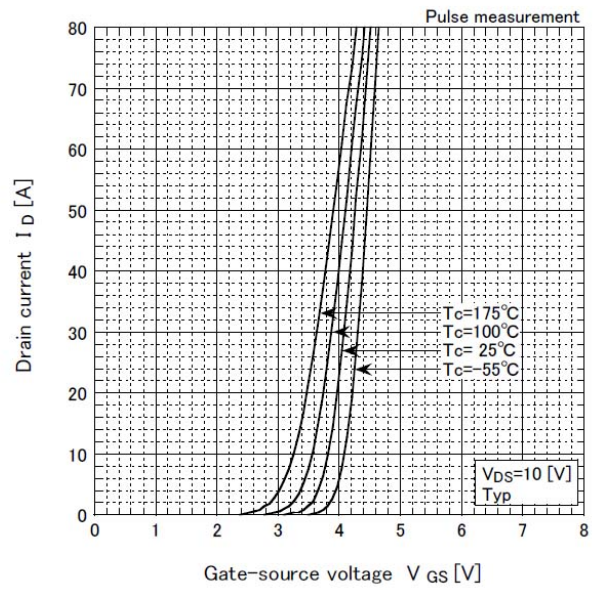
※ : See the original Specifications

# CHARACTERISTIC DIAGRAMS

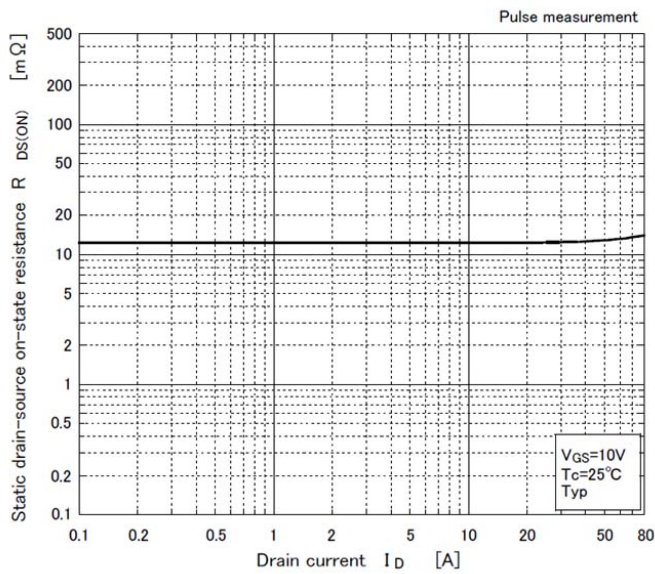
Typical output characteristics



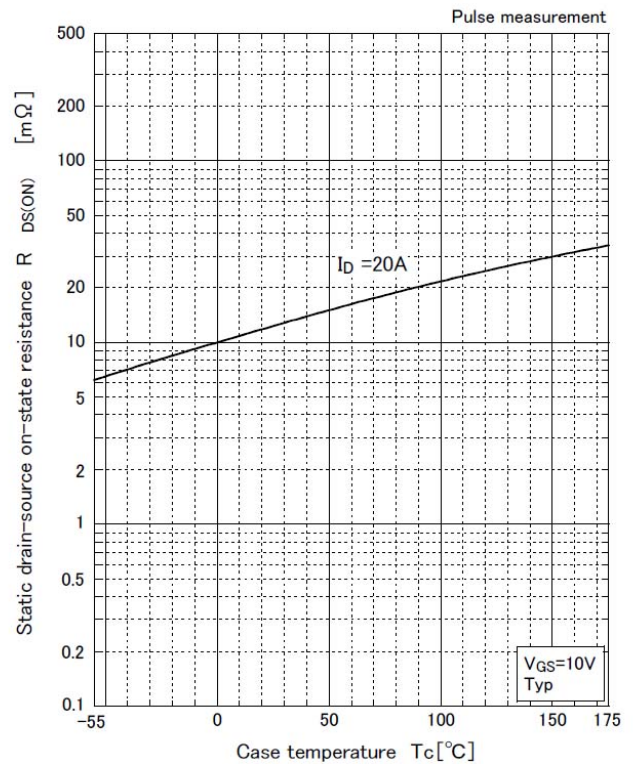
Transfer characteristics

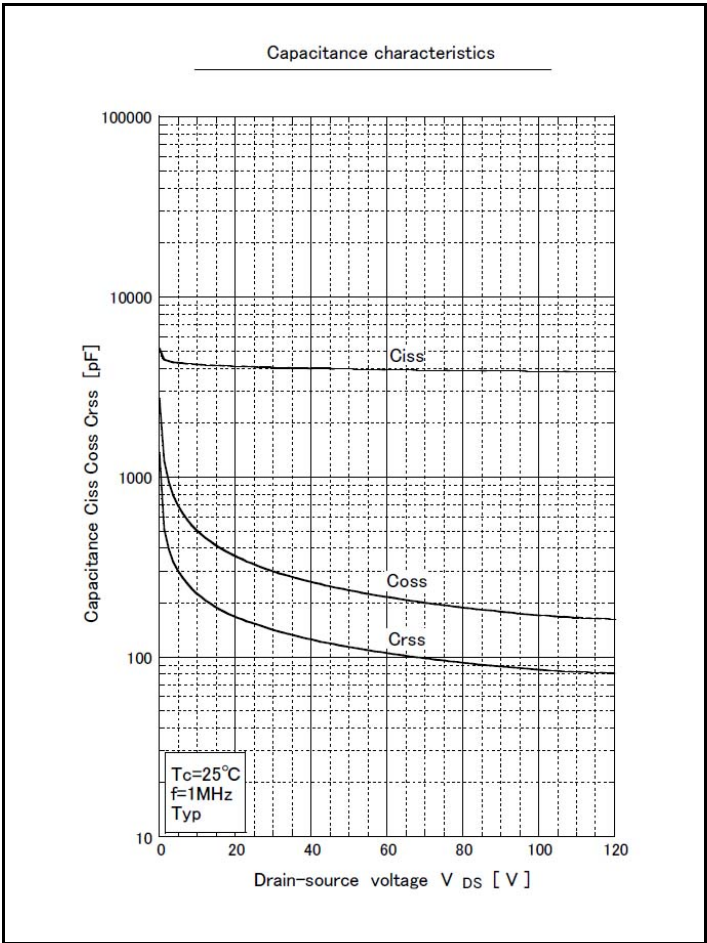
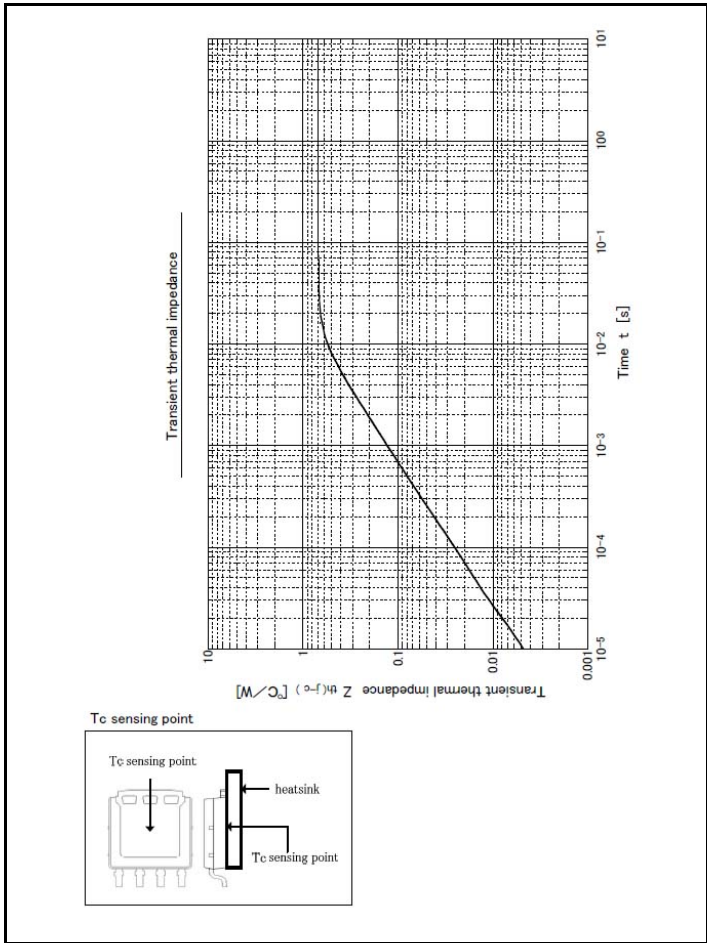
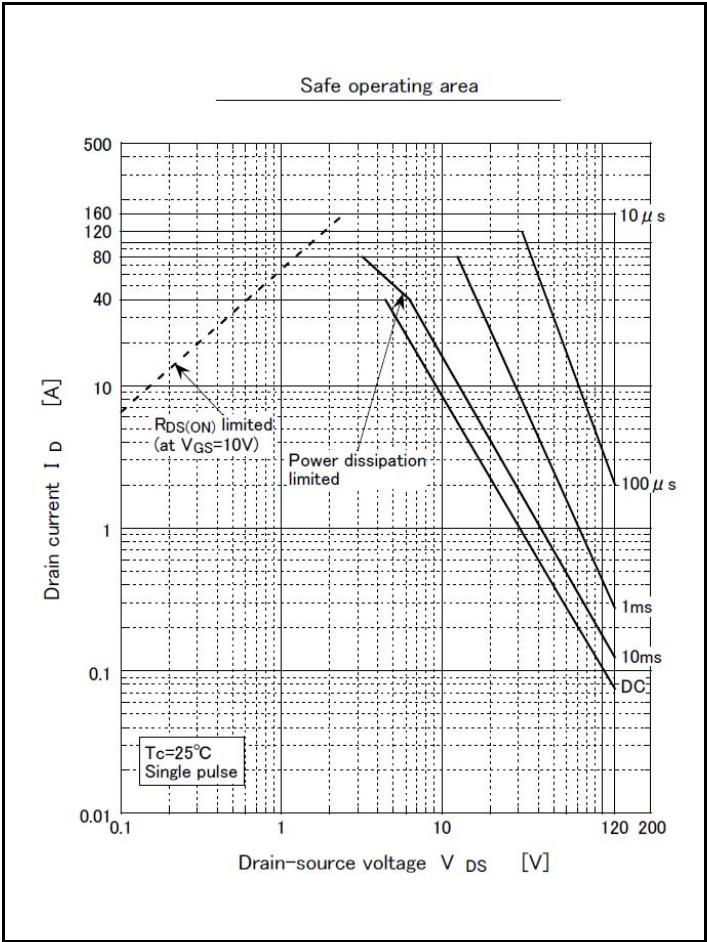
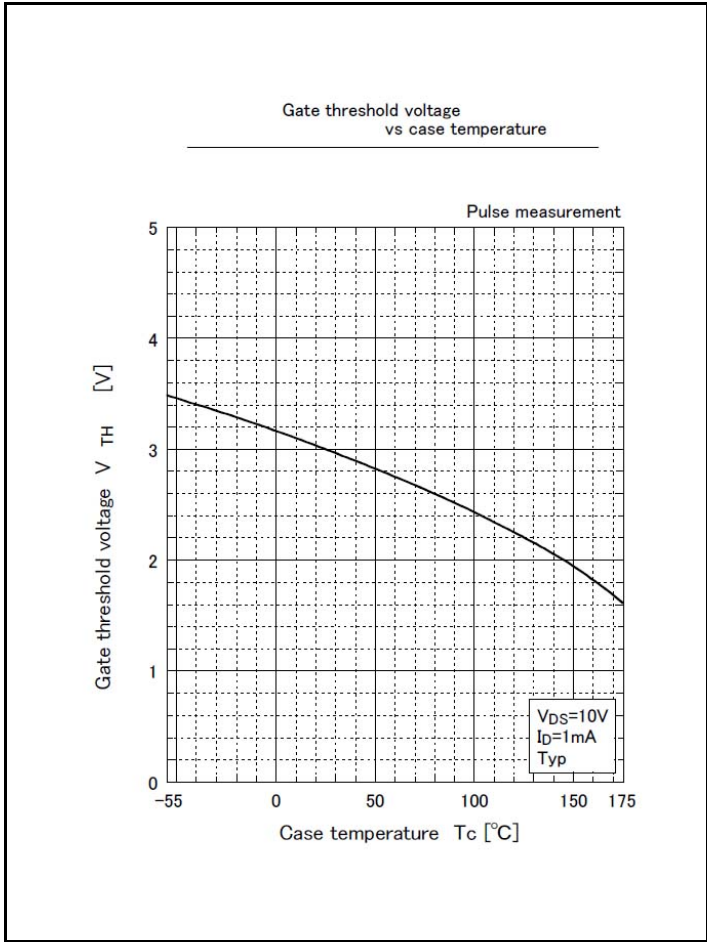


Static drain-source on-state resistance vs drain current



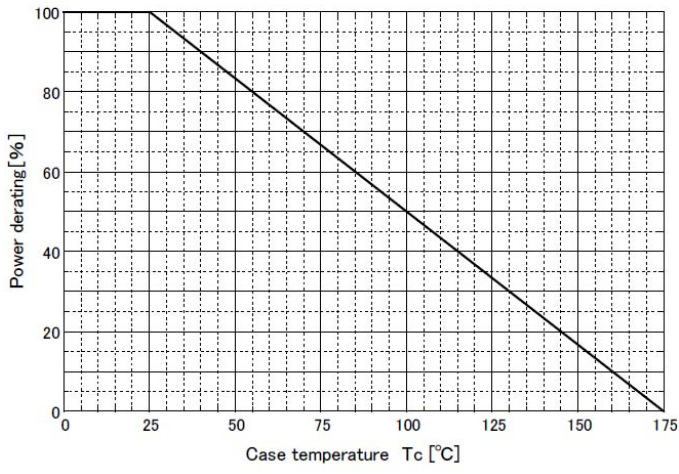
Static drain-source on-state resistance vs case temperature



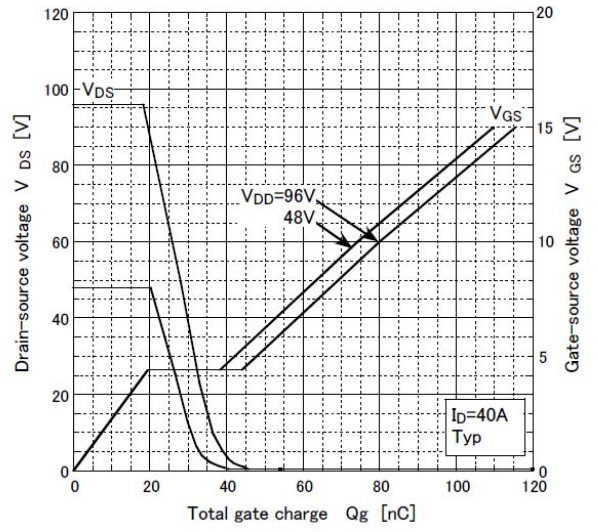




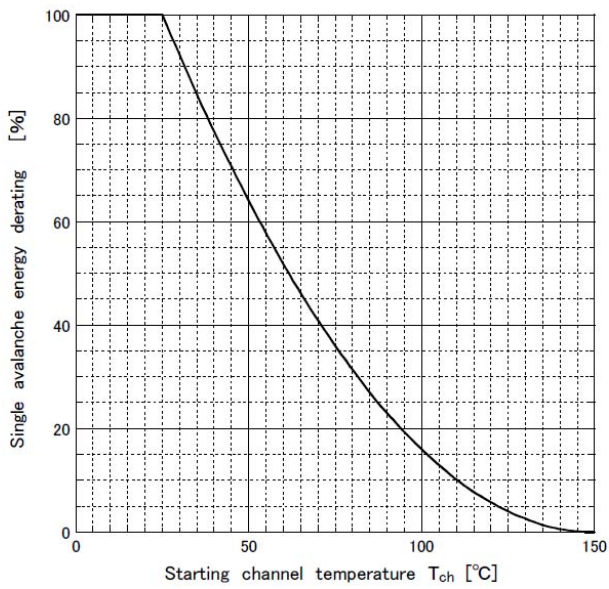
Power derating - case temperature



Gate charge characteristics

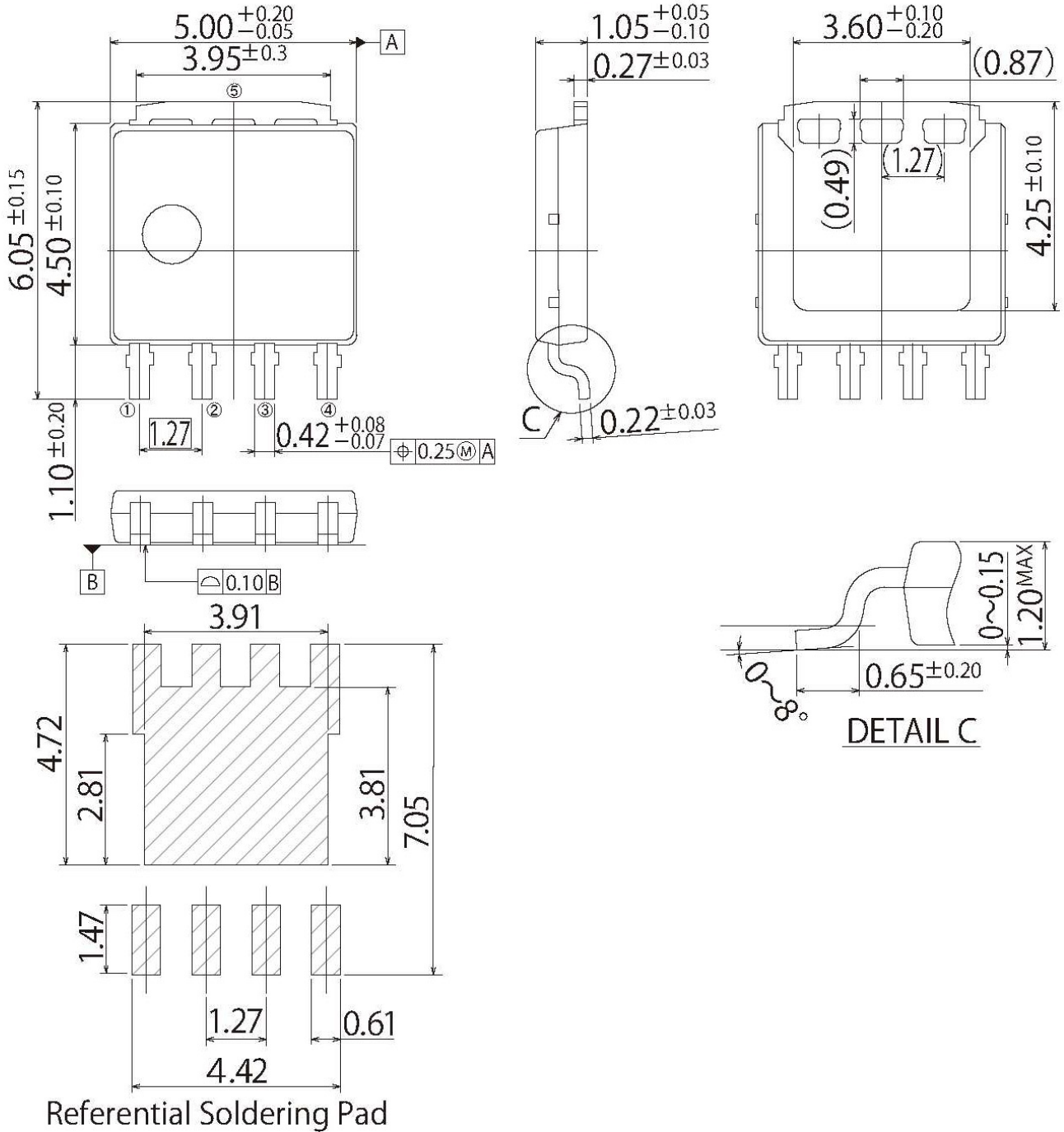


Single avalanche energy derating vs channel temperature



G7

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



## Notes

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