

P140LF4QLK

Power MOSFETs

40V, 140A, N-channel

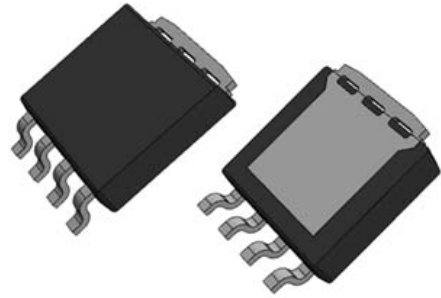
Feature

- N-channel
- Small SMD
- Large Current
- Low Ron
- 4.5V Gate Drive
- Low Capacitance
- Based on AEC-Q101
- Halogen free
- Pb free terminal
- RoHS:Yes

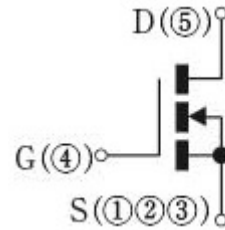
OUTLINE

Package (House Name): LF

Package (JEDEC Code): MO-235B similar



Equivalent circuit



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

Item	Symbol	Conditions	Ratings	Unit
Storage temperature	Tstg		-55 to 175	°C
Channel temperature	Tch		-55 to 175	°C
Drain-source voltage	V _{DSS}		40	V
Gate-source voltage	V _{GSS}		±20	V
Continuous drain current(DC)	I _D		140	A
Continuous drain current(Peak)	I _{DP}	Pulse width 10μs, duty=1/100	560	A
Total power dissipation	P _T		217	W
Single avalanche current	I _{AS}	Starting T _{ch} =25°C T _{ch} ≤150°C	60	A
Single avalanche energy	E _{AS}	Starting T _{ch} =25°C T _{ch} ≤150°C	385	mJ

* : See the original Specifications

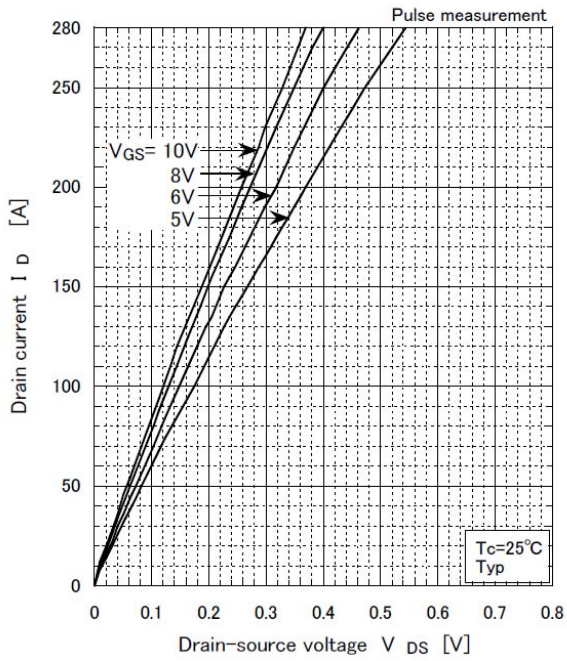
Electrical Characteristics (unless otherwise specified : Tc=25°C)

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	μ A
Gate-source leakage current	I_{GSS}	VGS=±20V, VDS=0V			±0.1	μ A
Forward transconductance	g_{fs}	ID=70A, VDS=10V	30			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=70A, VGS=10V		0.00117	0.00142	Ω
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=70A, VGS=4.5V		0.00185	0.0025	Ω
Gate threshold voltage	V_{th}	ID=1mA, VDS=10V	1.5	2	2.5	V
Source-drain diode forward voltage	V_{SD}	IS=140A, 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=32V, VGS=10V, ID=140A		122		nC
Gate to source charge	Q_{gs}	VDD=32V, VGS=10V, ID=140A		24		nC
Gate to drain charge	Q_{gd}	VDD=32V, VGS=10V, ID=140A		37		nC
Input capacitance	C_{iss}	VDS=25V, VGS=0V, f=1MHz		6630		pF
Reverse transfer capacitance	C_{rss}	VDS=25V, VGS=0V, f=1MHz		405		pF
Output capacitance	C_{oss}	VDS=25V, VGS=0V, f=1MHz		805		pF
Turn-on delay time	$t_{d(on)}$	ID=70A, RL=0.29 Ω , VDD=20V, Rg=0 Ω , VGS(+)=10V, VGS(-)=0V		7.5		ns
Rise time	t_r	ID=70A, RL=0.29 Ω , VDD=20V, Rg=0 Ω , VGS(+)=10V, VGS(-)=0V		18		ns
Turn-off delay time	$t_{d(off)}$	ID=70A, RL=0.29 Ω , VDD=20V, Rg=0 Ω , VGS(+)=10V, VGS(-)=0V		139		ns
Fall time	t_f	ID=70A, RL=0.29 Ω , VDD=20V, Rg=0 Ω , VGS(+)=10V, VGS(-)=0V		51		ns
Diode reverse recovery time	t_{rr}	IF=140A, VGS=0V, di/dt=100A/ μ s		44		ns
Diode reverse recovery charge	Q_{rr}	IF=140A, VGS=0V, di/dt=100A/ μ s		52		nC

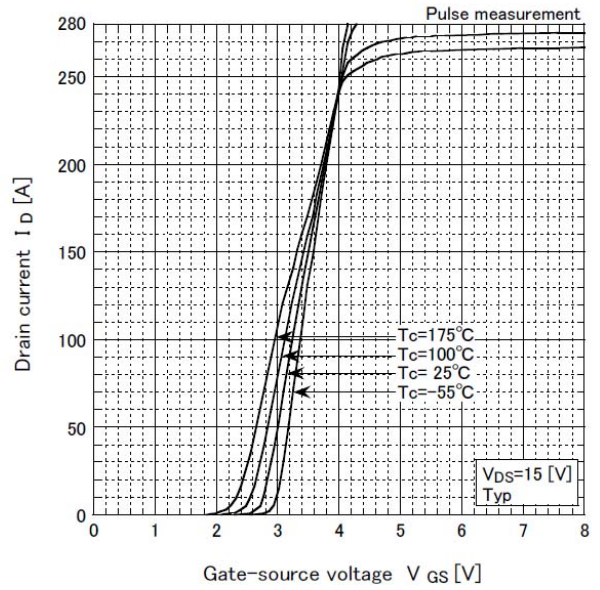
※ : See the original Specifications

CHARACTERISTIC DIAGRAMS

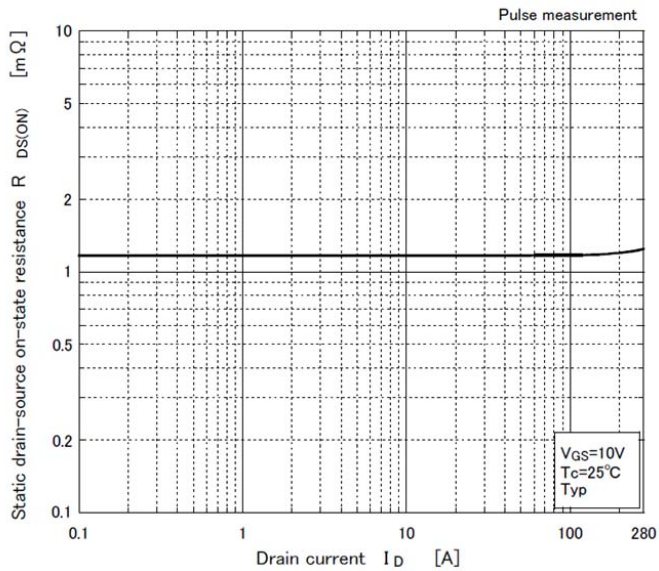
Typical output characteristics



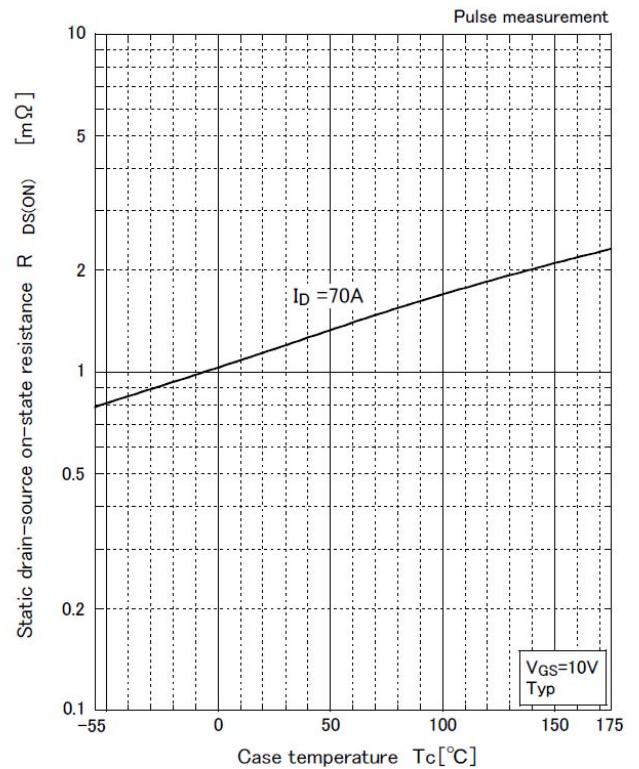
Transfer characteristics

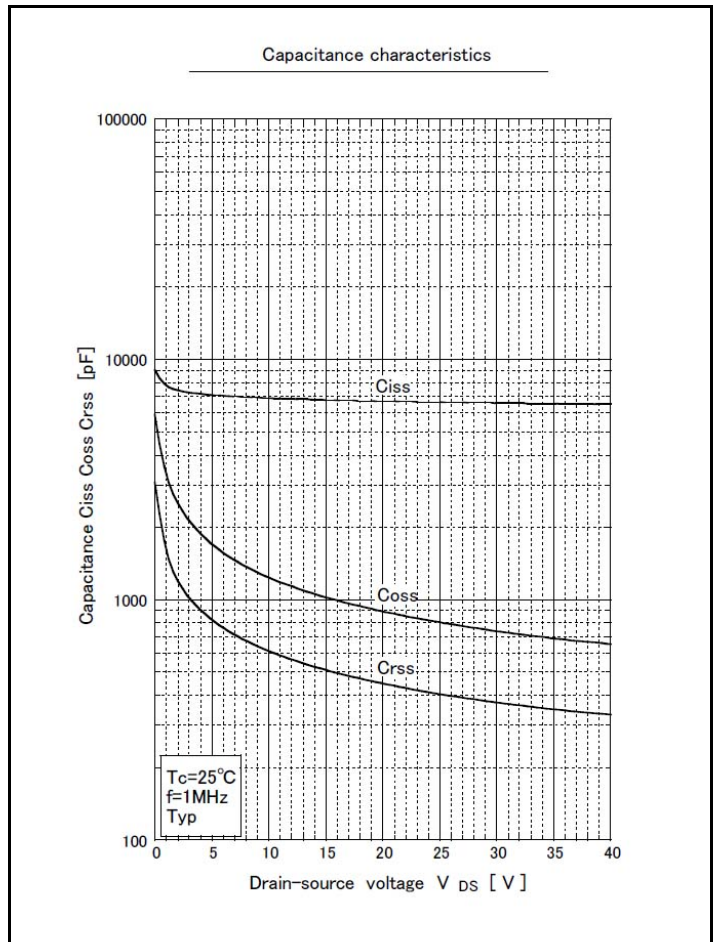
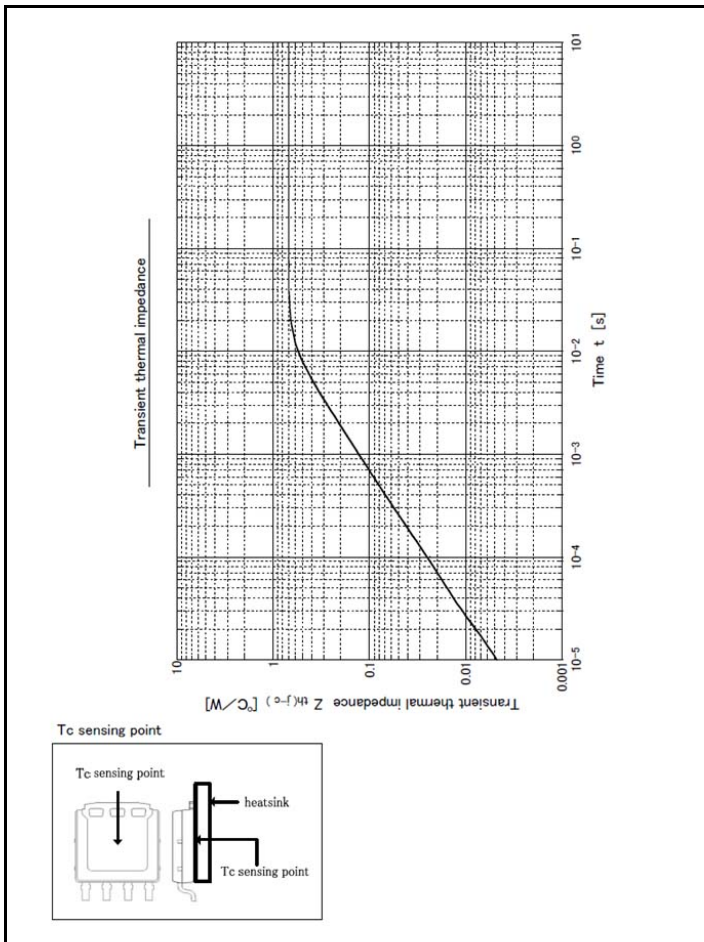
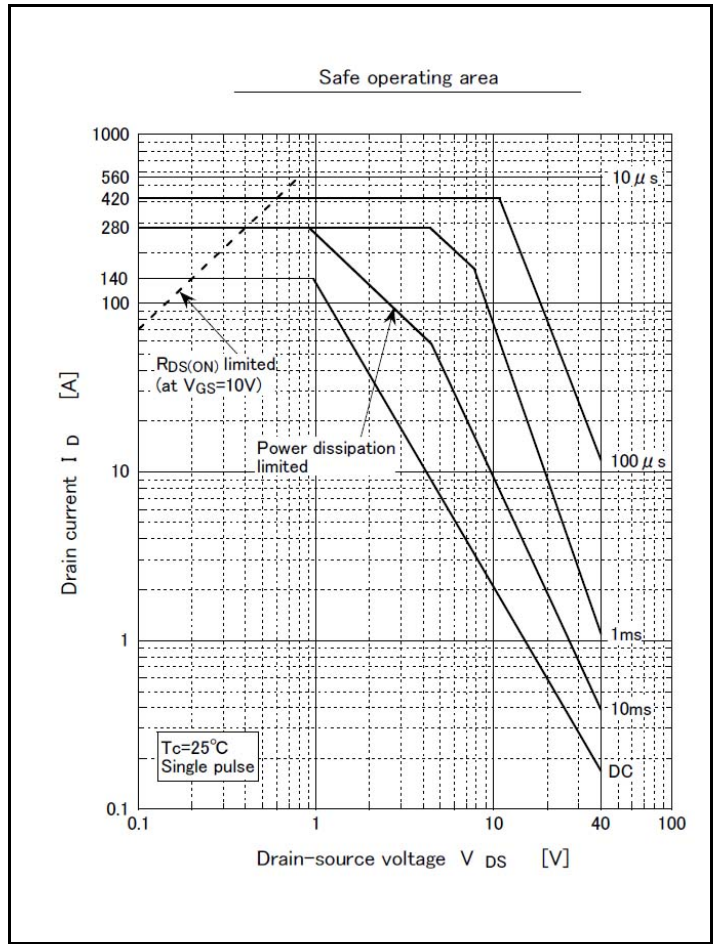
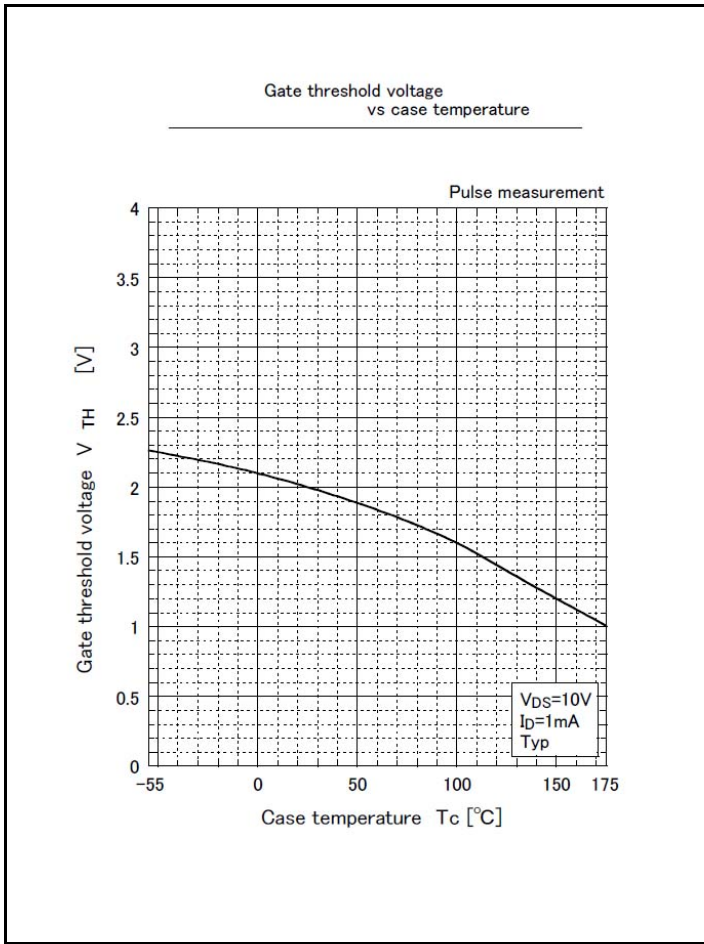


Static drain-source on-state resistance vs drain current

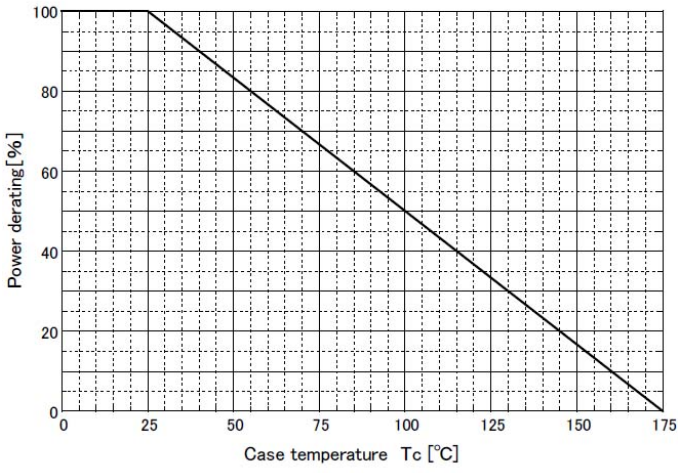


Static drain-source on-state resistance vs case temperature

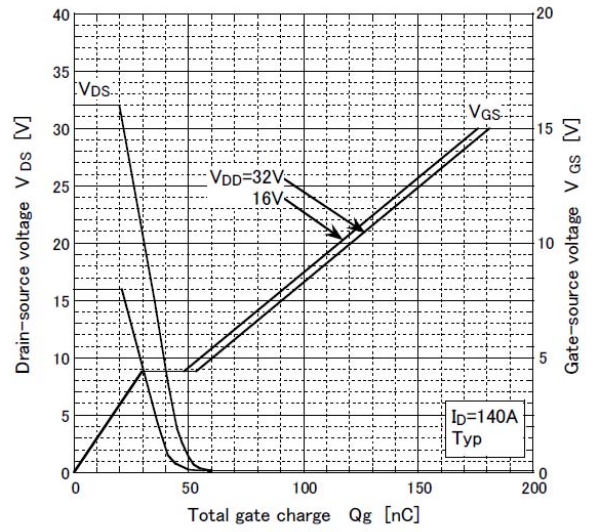




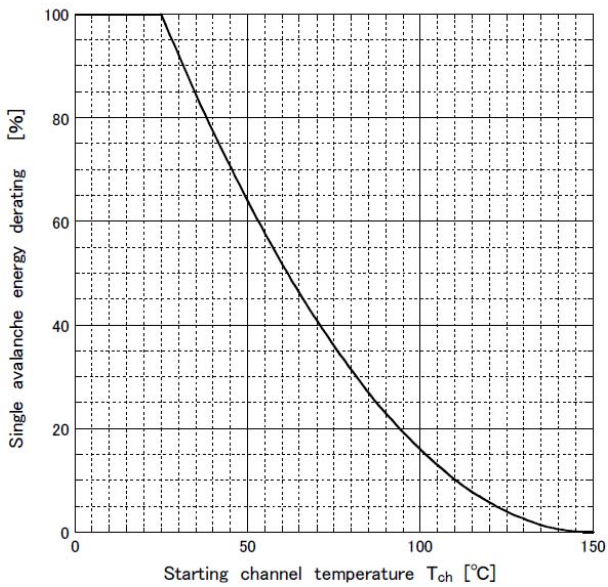
Power derating - case temperature



Gate charge characteristics

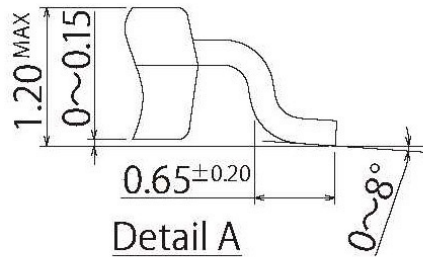
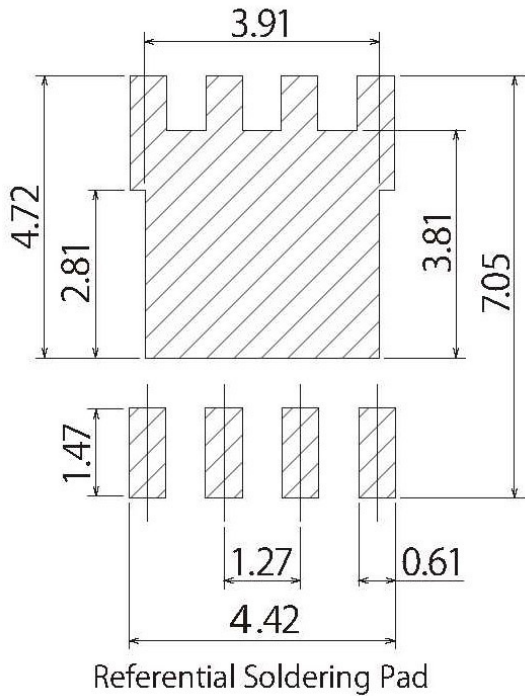
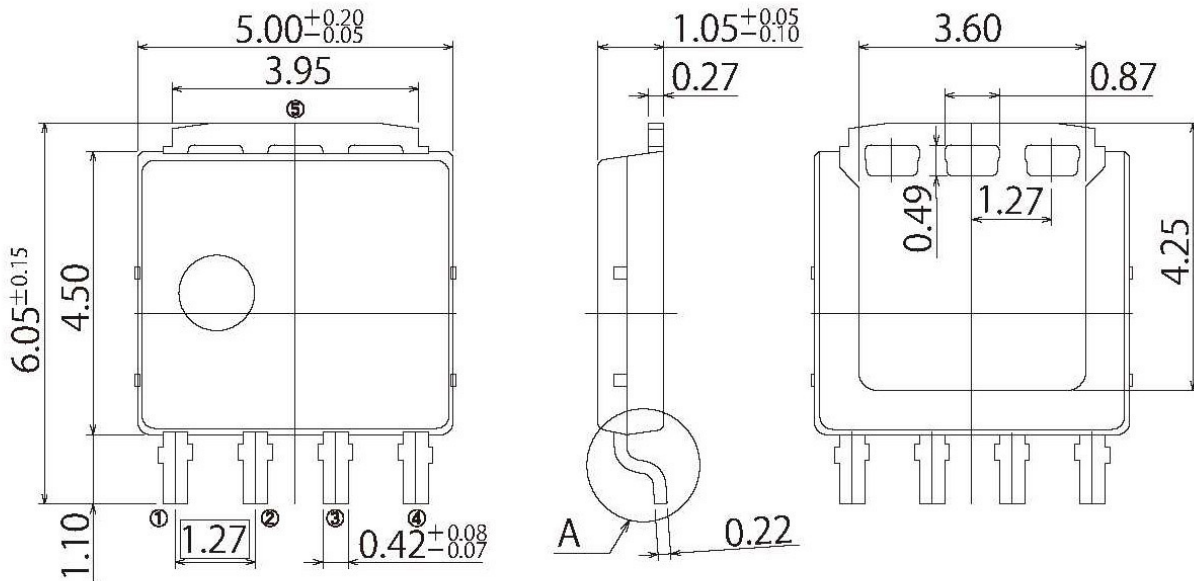


Single avalanche energy derating vs channel temperature



G7

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



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

Notes

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