

# P140LF4QNK

Power MOSFETs  
40V, 140A, N-channel

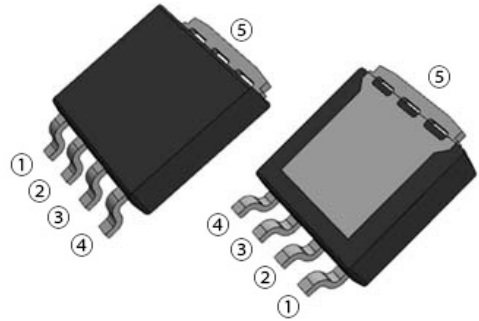
## Feature

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

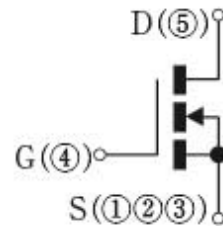
## OUTLINE

Package (House Name): LF

Package (JEDEC Code): MO-235B similar



## Equivalent circuit



## Absolute Maximum Ratings (unless otherwise specified : Tc=25°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>		40	V
Gate-source voltage	V <sub>GSS</sub>		±20	V
Continuous drain current(DC)	I <sub>D</sub>		140	A
Continuous drain current(Peak)	I <sub>DP</sub>	Pulse width 10μs, duty=1/100	560	A
Total power dissipation	P <sub>T</sub>		217	W
Single avalanche current	I <sub>AS</sub>	Starting Tch=25°C Tch ≤ 150°C	60	A
Single avalanche energy	E <sub>AS</sub>	Starting Tch=25°C Tch ≤ 150°C	385	mJ

※ : See the original Specifications

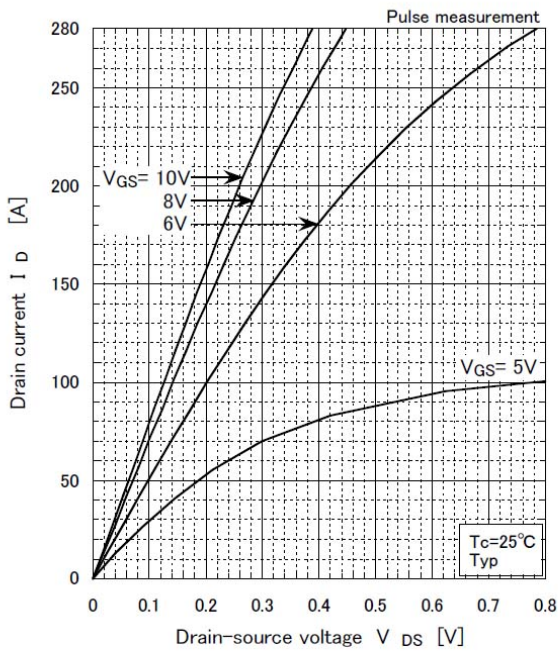
**Electrical Characteristics** (unless otherwise specified : Tc=25°C)

Item	Symbol	Conditions	Ratings			Unit
			MIN	TYP	MAX	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	ID=1mA, VGS=0V	40			V
Gate-source leakage current	$I_{GSS}$	VGS=±20V, VDS=0V			±0.1	μA
Forward transconductance	$g_{fs}$	ID=70A, VDS=10V	20			S
Static drain-source on-state resistance	$R_{DS(ON)}$	ID=70A, VGS=10V		0.00122	0.00148	Ω
Gate threshold voltage	Vth	ID=1mA, VDS=10V	2	3	4	V
Source-drain diode forward voltage	$V_{SD}$	IS=140A, VGS=0V			1.5	V
Thermal resistance	Rth(j-c)	Junction to case, with heatsink			0.69	°C/W
Total gate charge	Qg	VDD=32V, VGS=10V, ID=140A		96		nC
Gate to source charge	Qgs	VDD=32V, VGS=10V, ID=140A		28		nC
Gate to drain charge	Qgd	VDD=32V, VGS=10V, ID=140A		39		nC
Input capacitance	Ciss	VDS=25V, VGS=0V, f=1MHz		5530		pF
Reverse transfer capacitance	Crss	VDS=25V, VGS=0V, f=1MHz		400		pF
Output capacitance	Coss	VDS=25V, VGS=0V, f=1MHz		855		pF
Turn-on delay time	td(on)	ID=70A, RL=0.29Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		8.5		ns
Rise time	tr	ID=70A, RL=0.29Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		20		ns
Turn-off delay time	td(off)	ID=70A, RL=0.29Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		80		ns
Fall time	tf	ID=70A, RL=0.29Ω, VDD=20V, Rg=0Ω, VGS(+)=10V, VGS(-)=0V		40		ns
Diode reverse recovery time	trr	IF=140A, VGS=0V, di/dt=100A/μs		44		ns
Diode reverse recovery charge	Qrr	IF=140A, VGS=0V, di/dt=100A/μs		53		nC

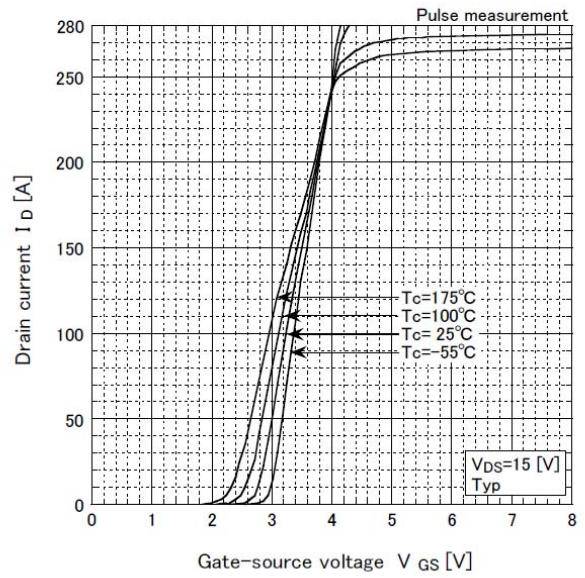
※ : See the original Specifications

# CHARACTERISTIC DIAGRAMS

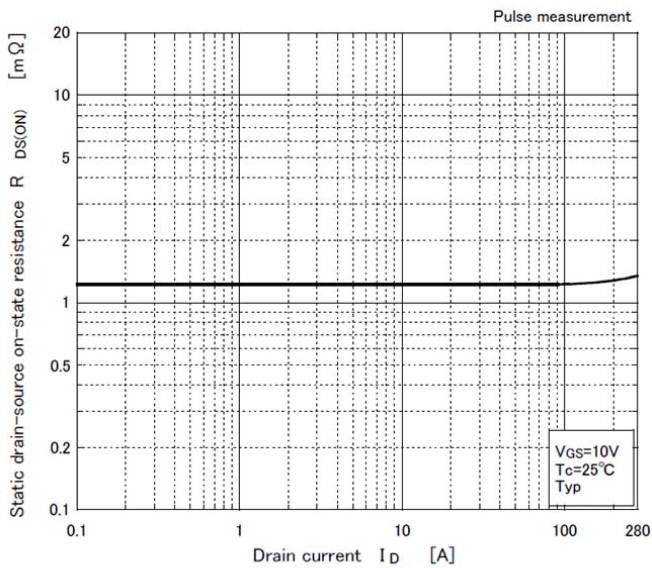
Typical output characteristics



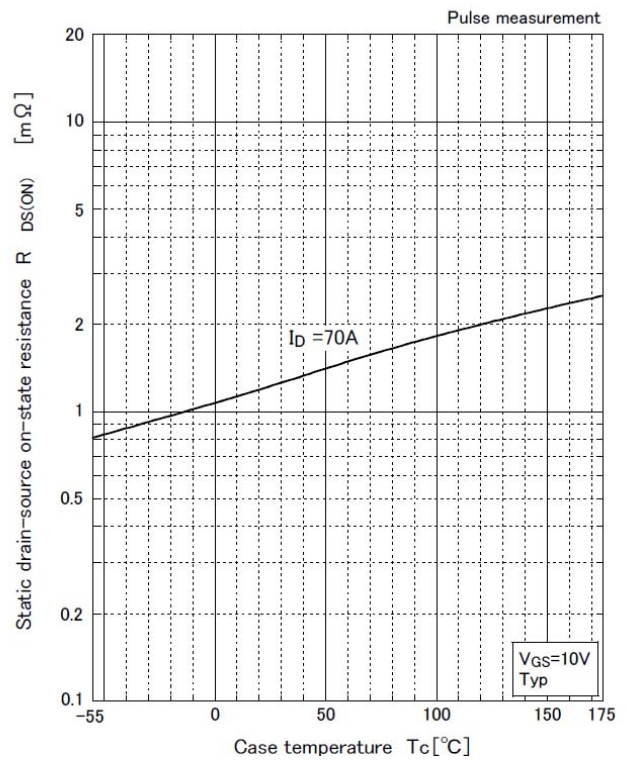
Transfer characteristics



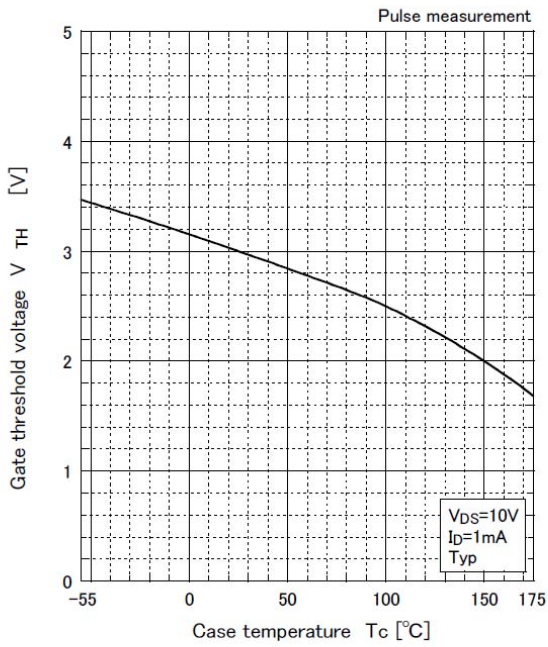
Static drain-source on-state resistance vs drain current



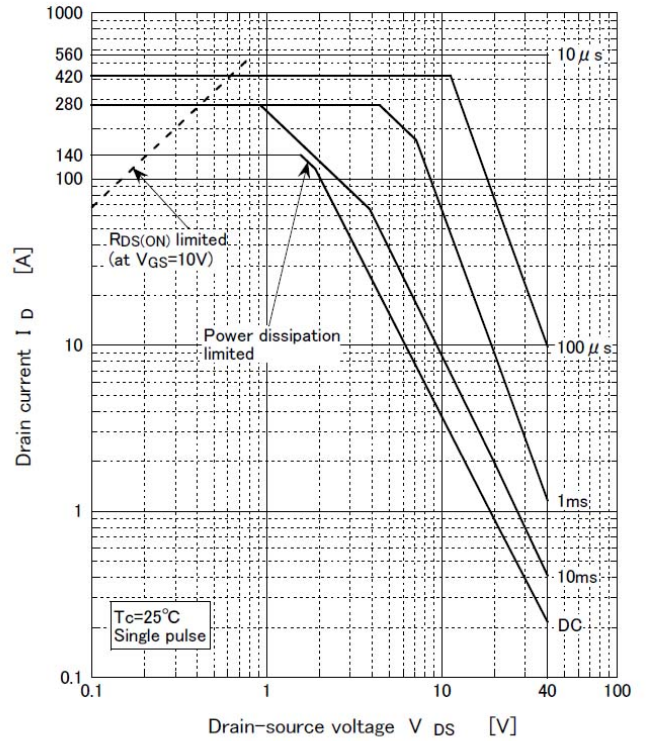
Static drain-source on-state resistance vs case temperature



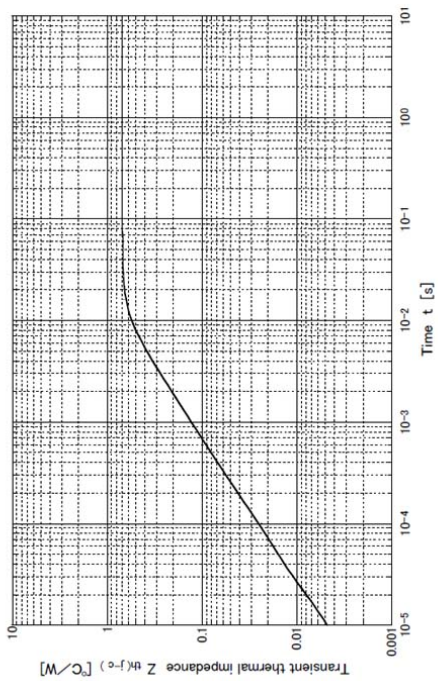
Gate threshold voltage vs case temperature



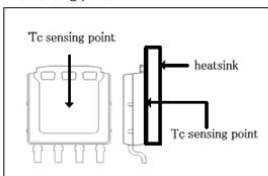
Safe operating area



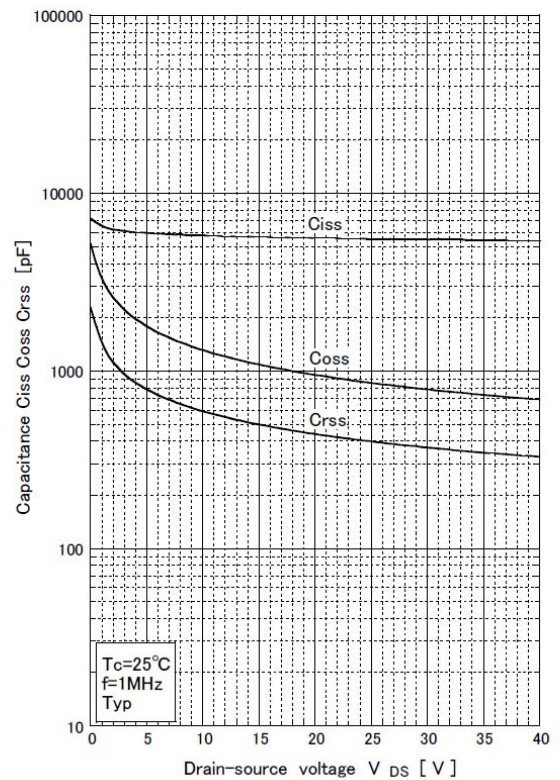
Transient thermal impedance



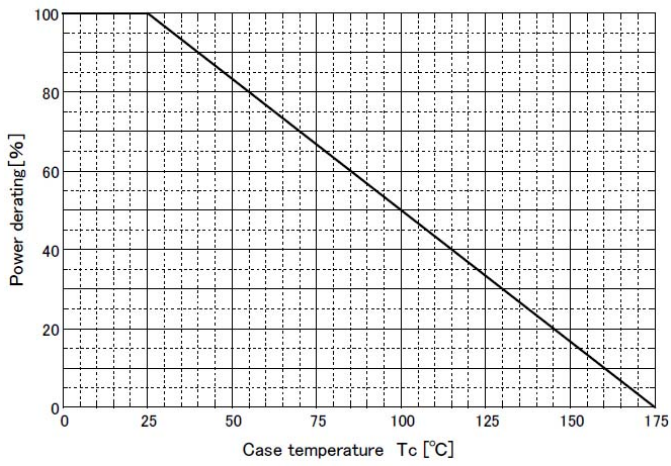
$T_c$  sensing point



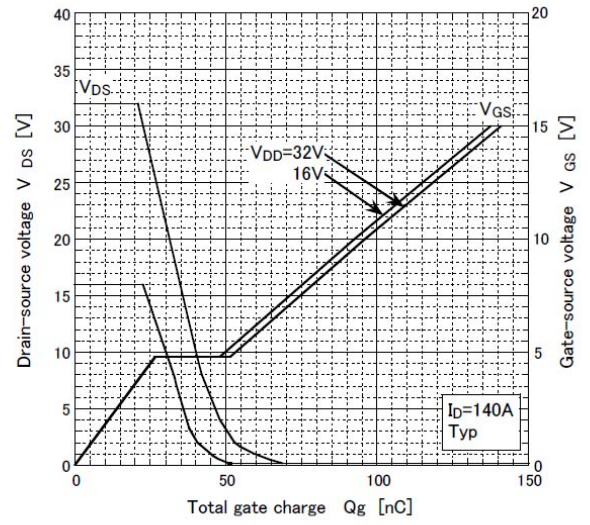
Capacitance characteristics



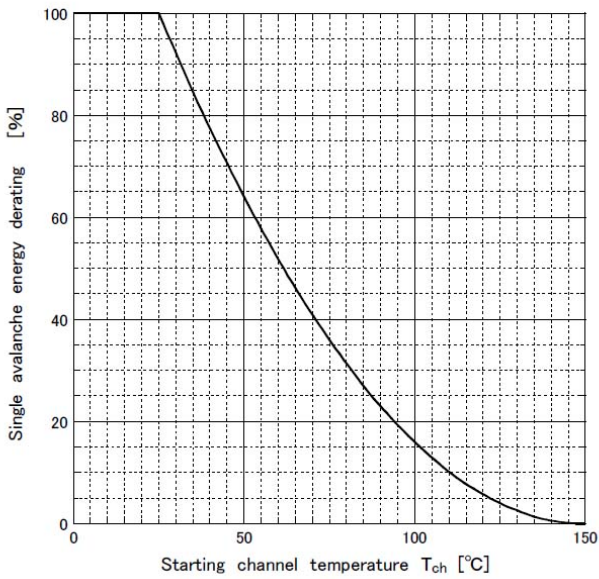
Power derating – case temperature



Gate charge characteristics

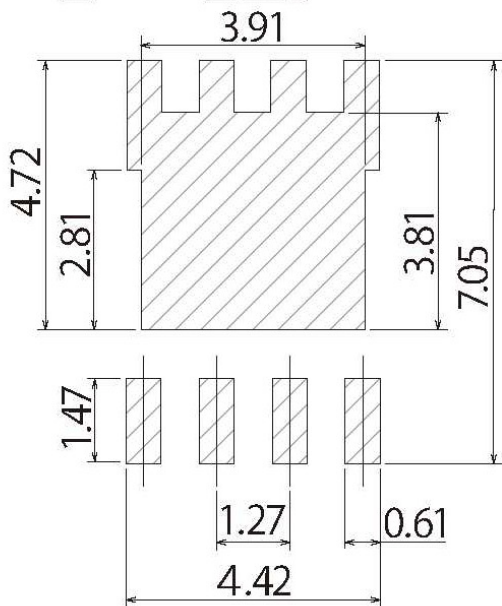
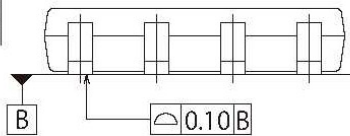
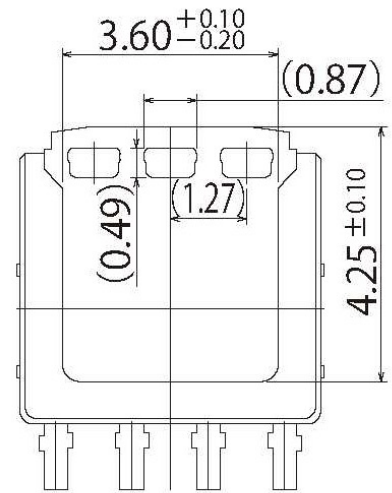
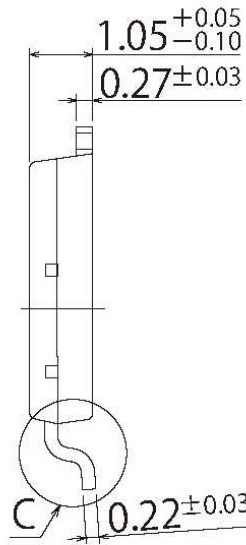
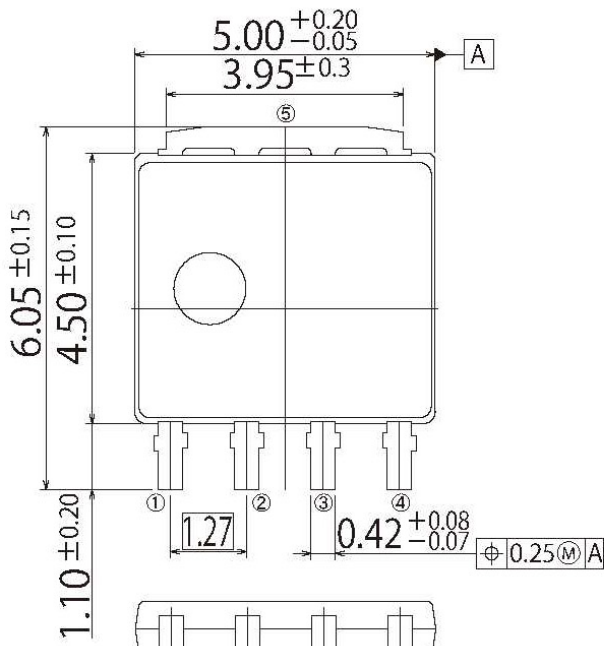


Single avalanche energy derating vs channel temperature

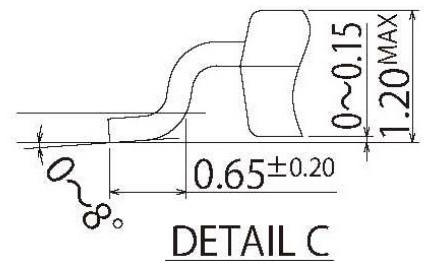


G7

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



Referential Soldering Pad



## Notes

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