ShinDengen

P140LF4QNK

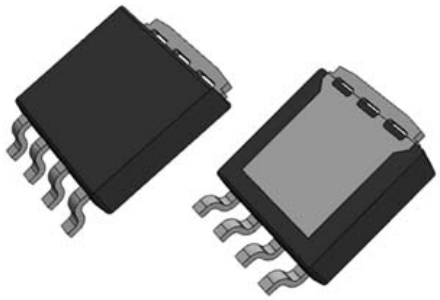
Power MOSFETs
40V, 140A, N-channel

Feature

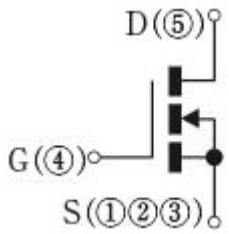
- N-channel
- Small SMD
- Large Current
- Low Ron
- 10V Gate Drive
- Low Capacitance
- Based on AEC-Q101
- Halogen free
- Pb free terminal
- RoHS:Yes

OUTLINE

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



Equivalent circuit



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

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		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 Tch=25℃ Tch≦150℃	60	A
Single avalanche energy	E_{AS}	Starting Tch=25℃ Tch≦150℃	385	mJ

※ ：See the original Specifications

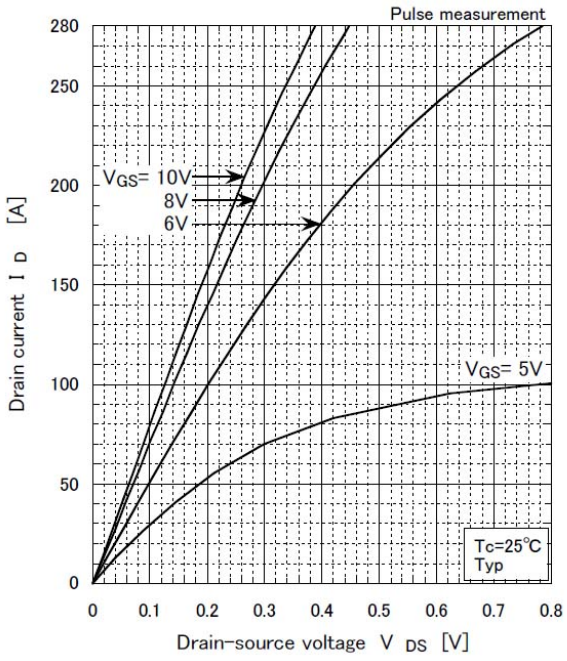
Electrical Characteristics (unless otherwise specified : Tc=25°C)

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	μA
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
Reverce transfer capacitnce	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

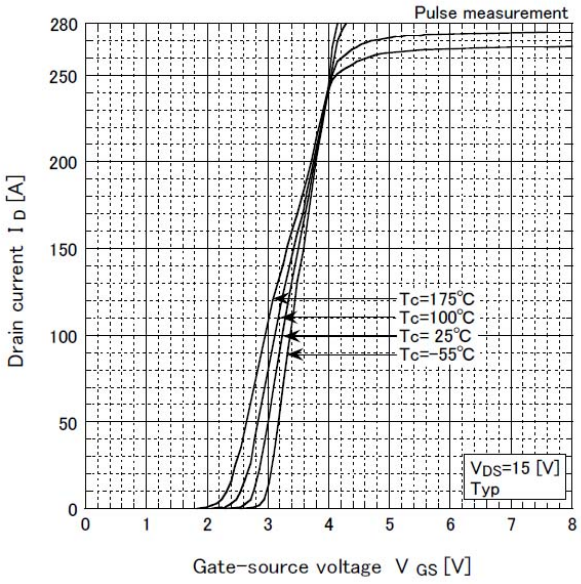
※ ：See the original Specifications

CHARACTERISTIC DIAGRAMS

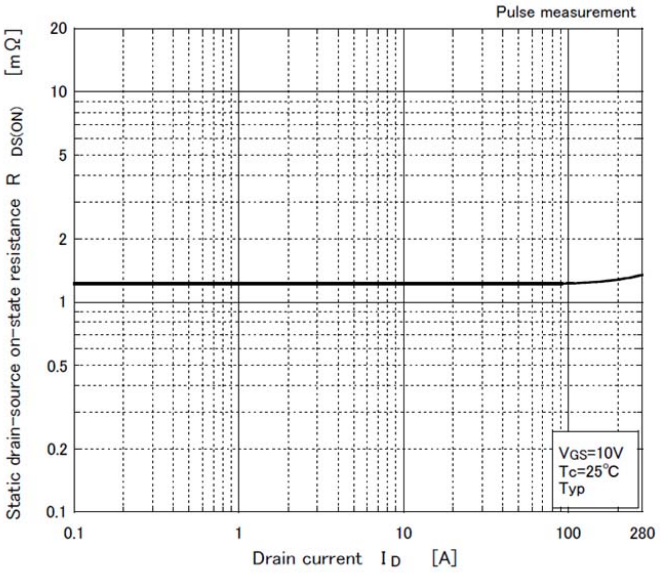
Typical output characteristics



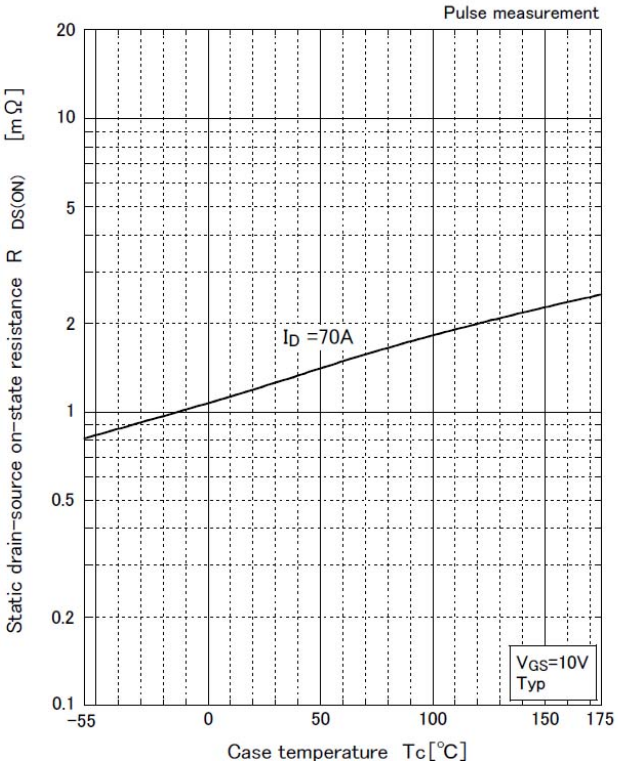
Transfer characteristics



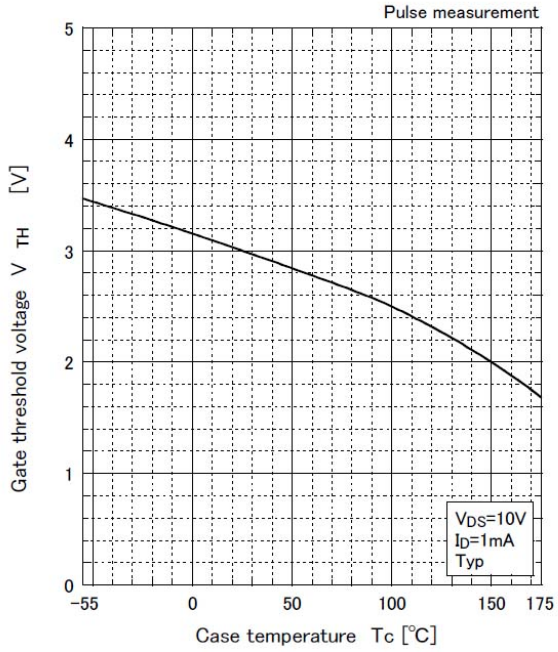
Static drain-source on-state resistance
vs drain current



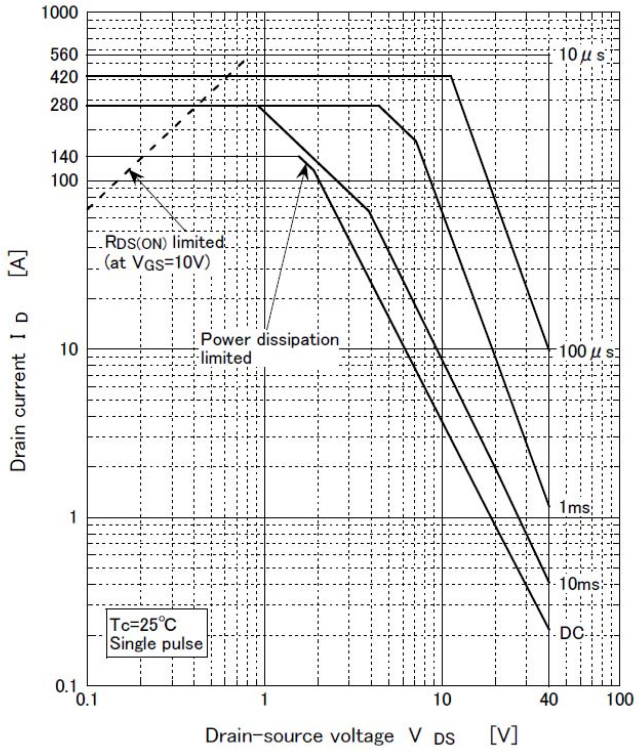
Static drain-source on-state resistance
vs case temperature

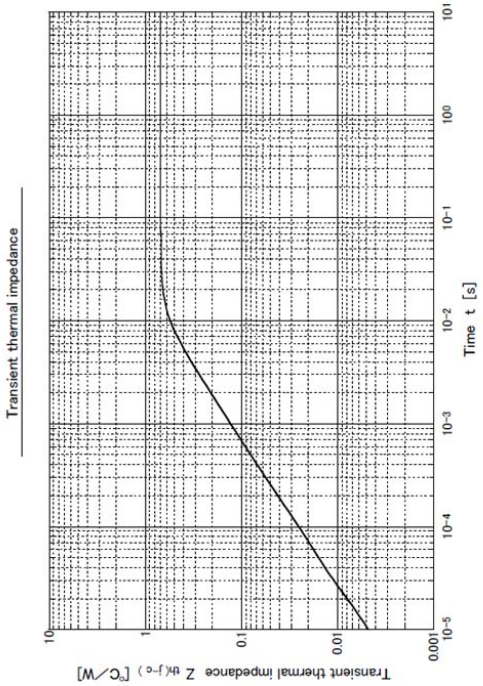


Gate threshold voltage
vs case temperature

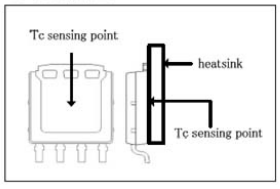


Safe operating area

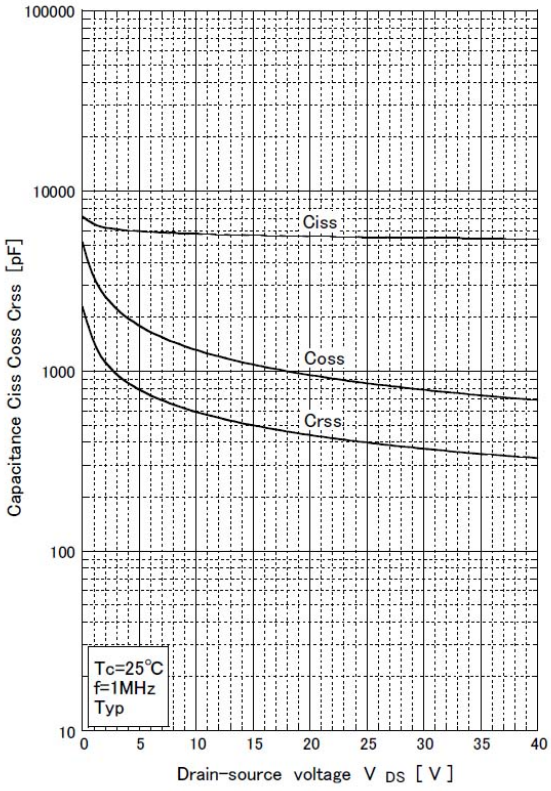




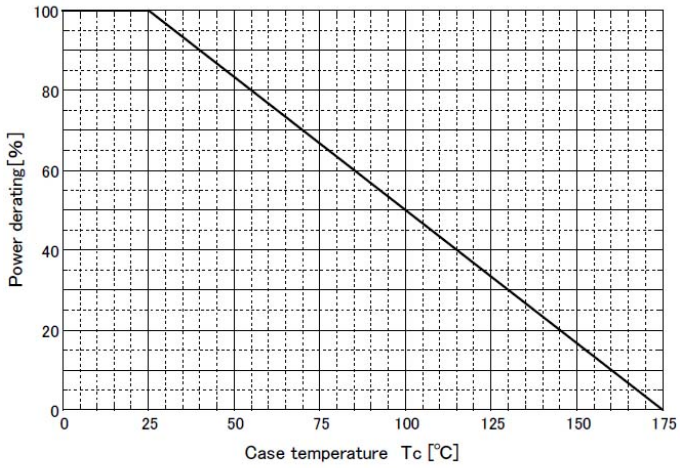
Tc sensing point



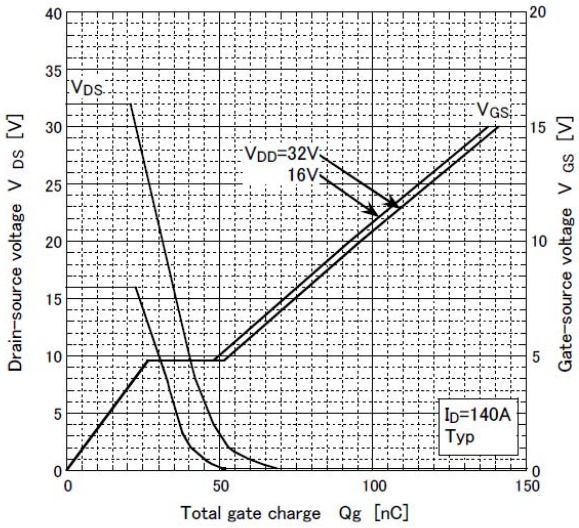
Capacitance characteristics



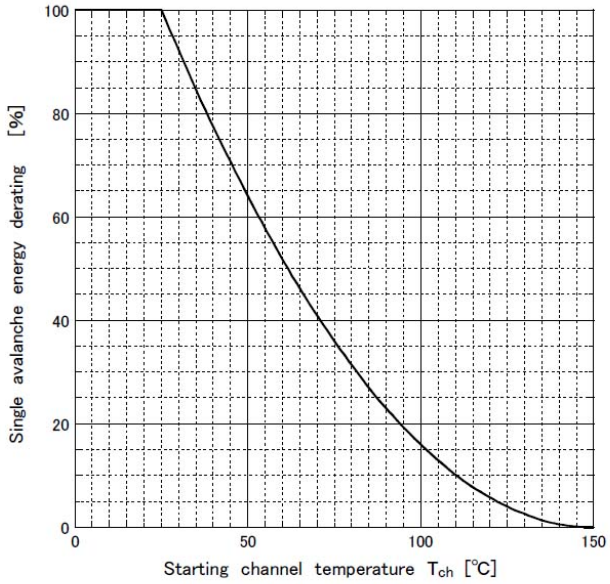
Power derating – case temperature



Gate charge characteristics



Single avalanche energy derating
vs channel temperature

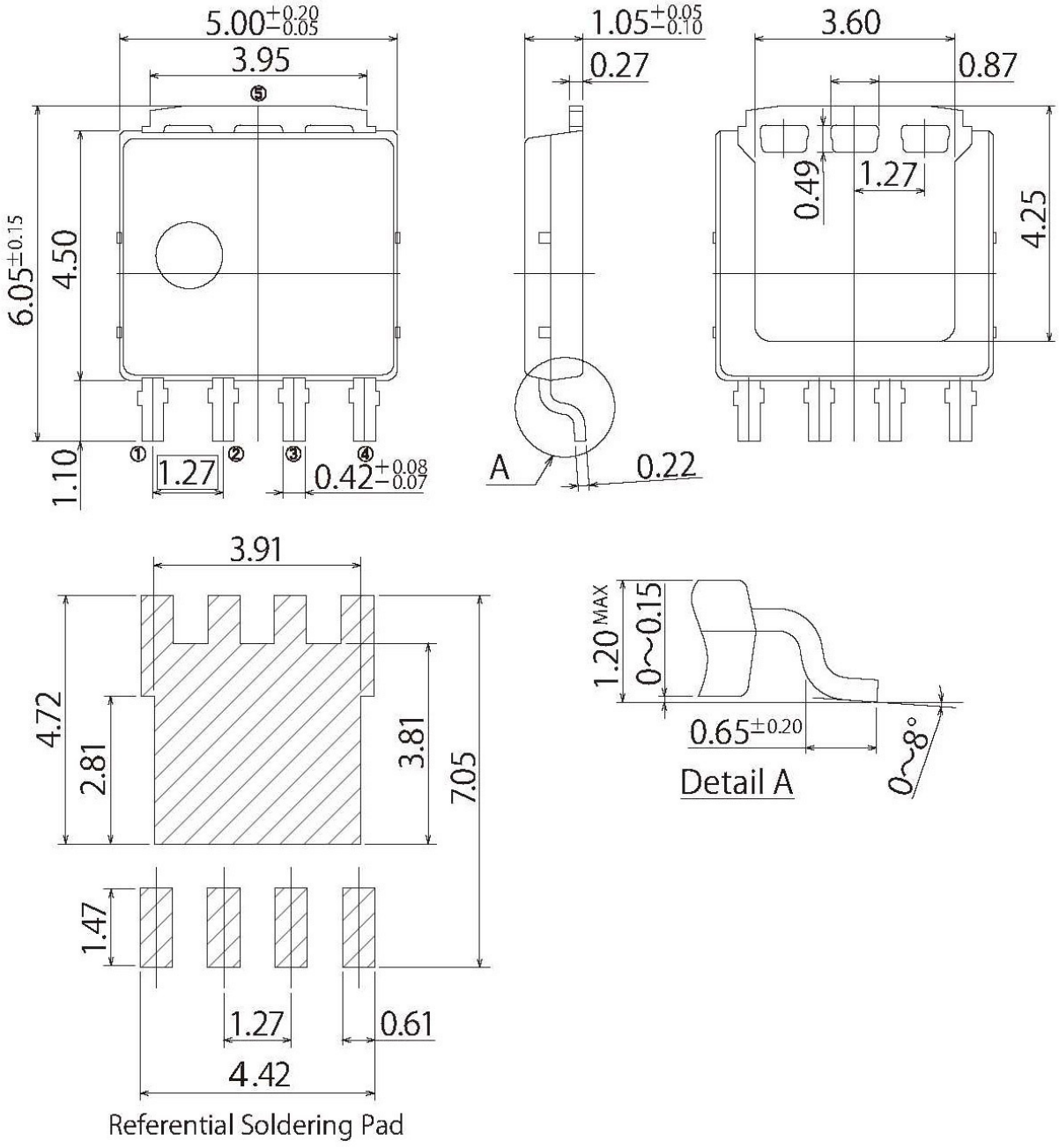


Outline Dimensions

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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