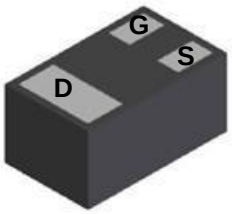
DFN1006-3L Plastic-Encapsulate MOSFETS

LJM2049PT12

Single P-Channel, -20V, -0.66A, Power MOSFET

V_{DS} (V)	Typical Rds(on) (Ω)
-20	0.460@ V_{GS}=-4.5V
	0.580@ V_{GS}=-2.5V
	0.720@ V_{GS}=-1.8V



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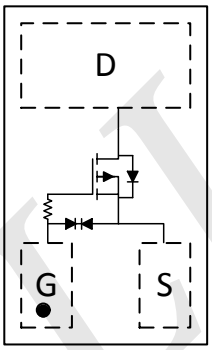


Pin configuration (Top view)

Descriptions

The LJM2049PT12 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product LJM2049PT12 is Pb-free and Halogen-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package DFN1006-3L

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Absolute Maximum ratings

Symbol	Parameter		10 S	Steady State	Unit
V_{DS}	Drain-Source Voltage		-20		V
V_{GS}	Gate-Source Voltage		±5		
I_D	Continuous Drain Current [a d]	T_A=25°C	-0.66	-0.50	A
		T_A=70°C	-0.41	-0.38	
P_D	Maximum Power Dissipation [a d]	T_A=25°C	0.31	0.27	W
		T_A=70°C	0.20	0.17	
I_D	Continuous Drain Current [b d]	T_A=25°C	-0.48	-0.45	A
		T_A=70°C	-0.38	-0.36	
P_D	Maximum Power Dissipation [b d]	T_A=25°C	0.28	0.24	W
		T_A=70°C	0.18	0.15	
I_{DM}	Pulsed Drain Current [c]		-1.2		A
T_J	Operating Junction Temperature		150		°C
T_L	Lead Temperature		260		°C
T_{stg}	Storage Temperature Range		-55 to 150		°C

Thermal resistance ratings

Symbol	Parameter		Typical	Maximum	Unit
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	340	395	°C/W
		Steady State	390	455	
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	387	441	
		Steady State	445	505	
$R_{\theta JC}$	Junction-to-Case Thermal Resistance	Steady State	240	285	

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR4 board using minimum pad size, 1oz copper

c Pulse width<380μs, Single pulse

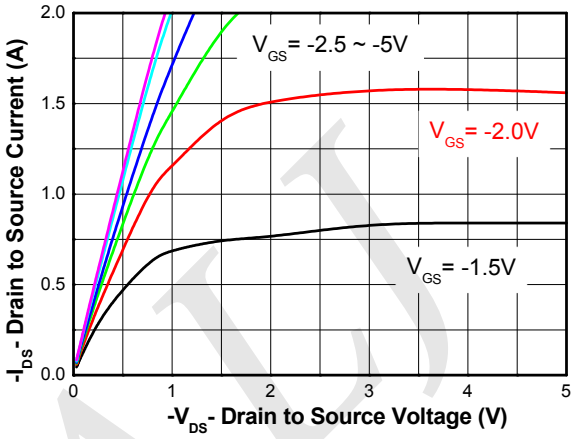
d Maximum junction temperature T_J=150° C.

e Pulse test: Pulse width <380 us duty cycle <2%.

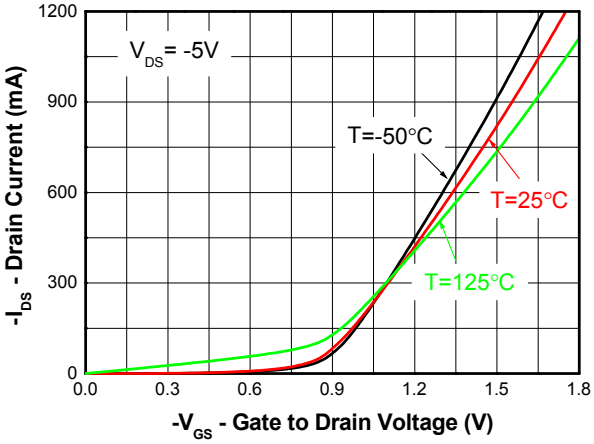
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
BV_{DSS}	Drain-to-Source Breakdown Voltage	V_{GS} = 0 V, I_D = -250uA	-20			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =-20 V, V_{GS} = 0V			-1	uA
I_{GSS}	Gate-to-source Leakage Current	V_{DS} = 0 V, V_{GS} =±10 V			±10	uA
ON CHARACTERISTICS						
$V_{GS(TH)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = -250uA	-0.35	-0.50	-0.80	V
$R_{DS(on)}$	Drain-to-source On-resistance [e]	VGS = -4.5V, ID = -0.50A		460	520	mΩ
		VGS = -2.5V, ID = -0.50A		580	700	
		VGS = -1.8V, ID = -0.50A		720	1000	
g_{FS}	Forward Transconductance	VDS = -5 V, ID = -0.45A			15	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
C_{ISS}	Input Capacitance	V_{GS} = 0 V, f =100KHz, V_{DS} = -10 V		74.5		pF
C_{OSS}	Output Capacitance			10.8		
C_{RSS}	Reverse Transfer Capacitance			10.2		
$Q_{G(TOT)}$	Total Gate Charge	V_{GS} = -4.5 V, V_{DS} = -10 V, I_D = -0.45A		0.88		nC
$Q_{G(TH)}$	Threshold Gate Charge			0.07		
Q_{GS}	Gate-to-Source Charge			0.15		
Q_{GD}	Gate-to-Drain Charge			0.28		
SWITCHING CHARACTERISTICS						
td(ON)	Turn-On Delay Time	V_{GS} = -4.5 V, V_{DS} = -10V, ID=-0.45A, R_G=6 Ω		45		ns
tr	Rise Time			140		
td(OFF)	Turn-Off Delay Time			1500		
tf	Fall Time			2100		
DIODE CHARACTERISTICS						
V_{SD}	Forward Voltage	V_{GS} = 0 V, I_S = -0.15A			-1.5	V

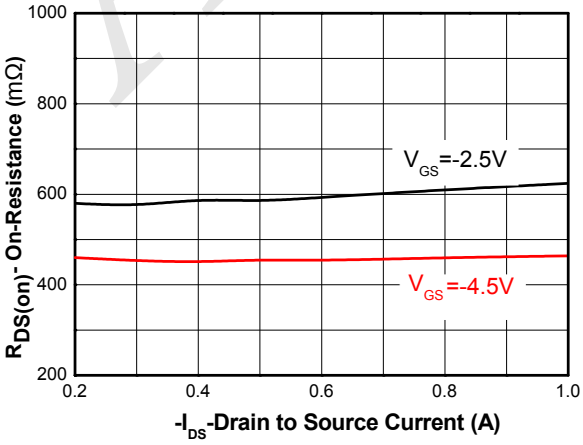
Typical Characteristics (Ta=25°C, unless otherwise noted)



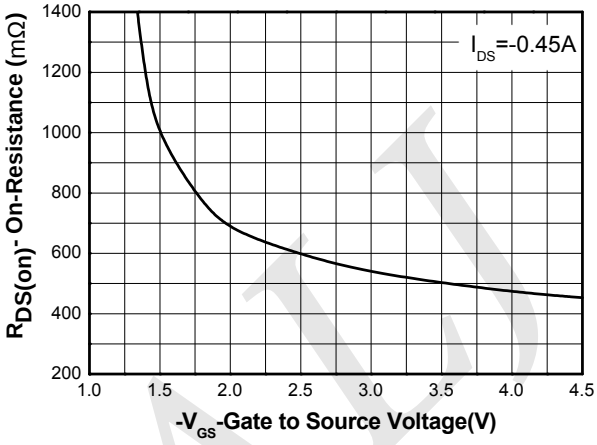
Output characteristics



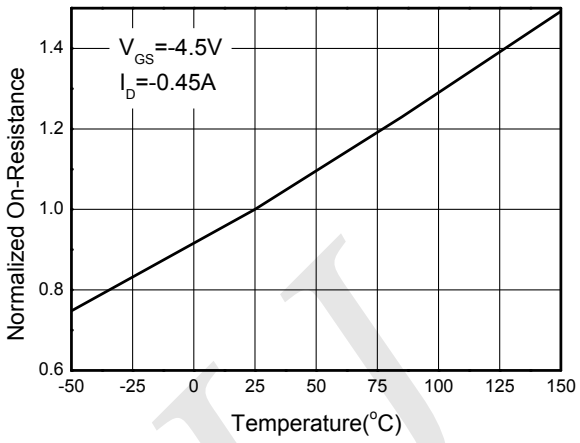
Transfer characteristics



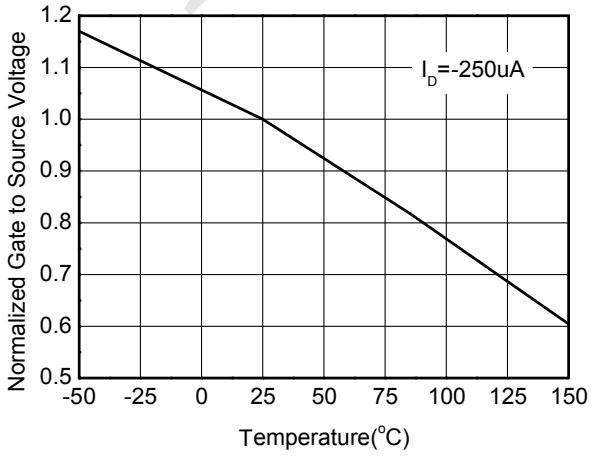
On-Resistance vs. Drain current



On-Resistance vs. Gate-to-Source voltage

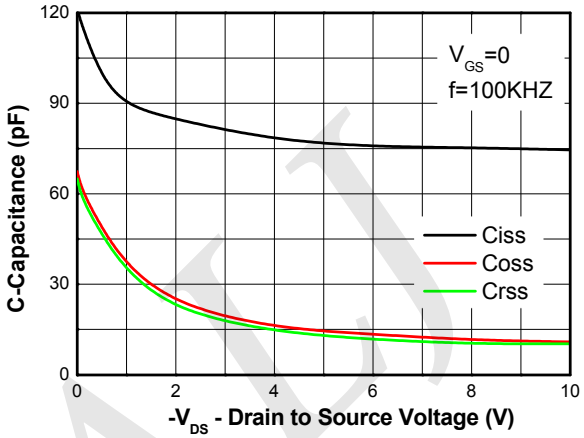


On-Resistance vs. Junction temperature

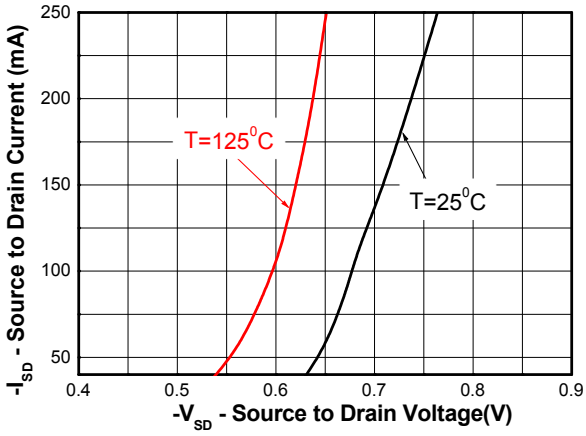


Threshold voltage vs. Temperature

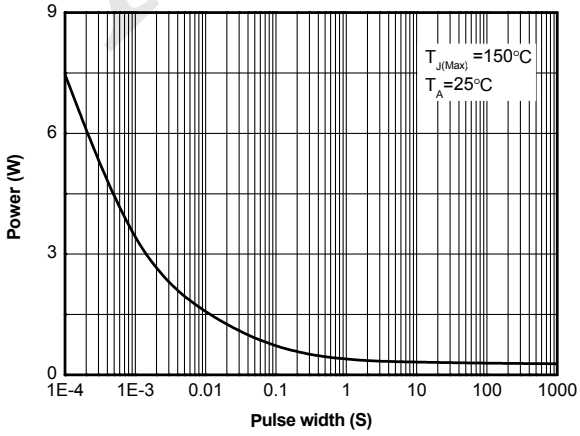
Typical Characteristics (Ta=25°C, unless otherwise noted)



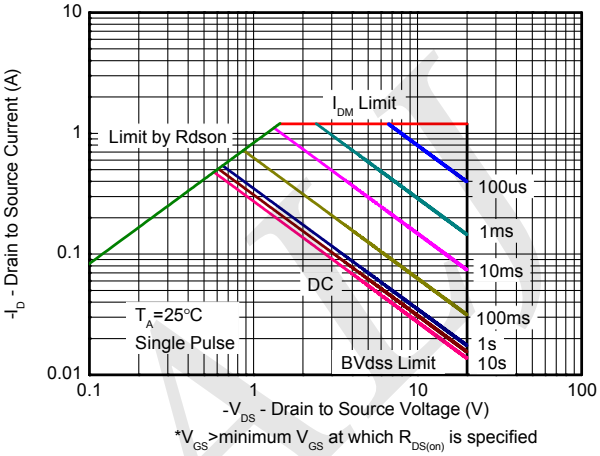
Capacitance



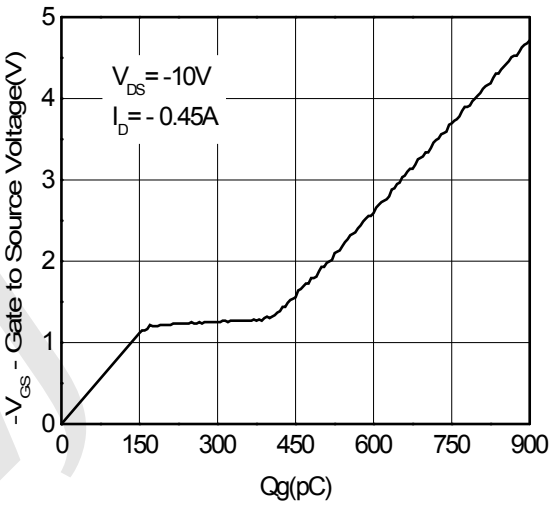
Body diode forward voltage



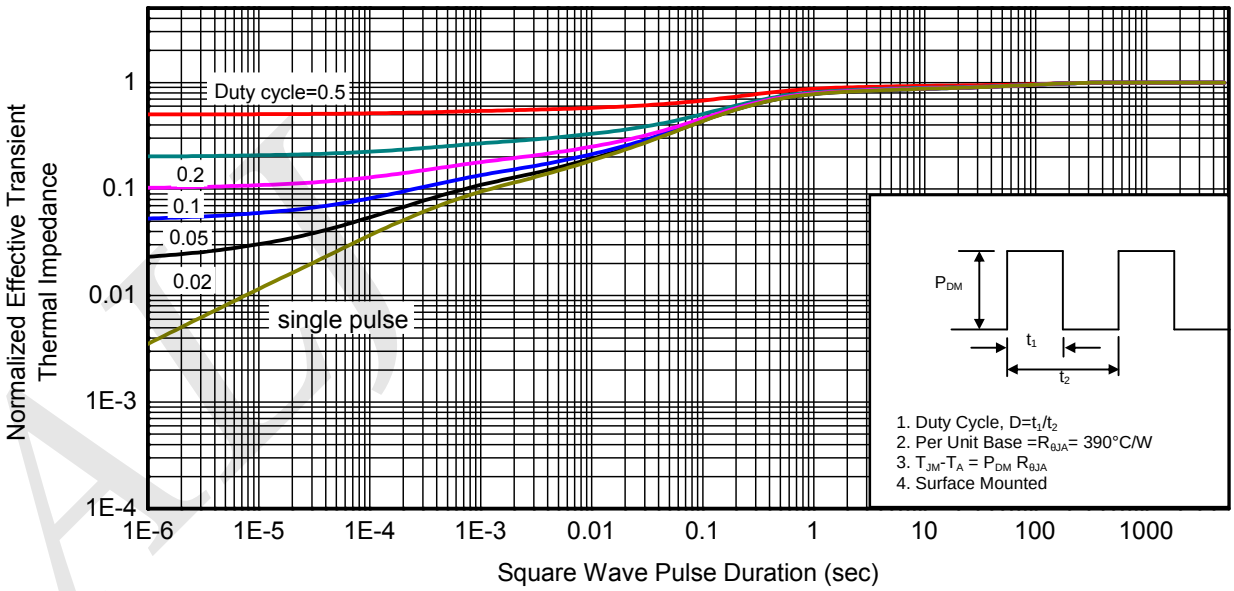
Single pulse power



Safe operating power



Typical Characteristics (Ta=25°C, unless otherwise noted)



Transient thermal response (Junction-to-Ambient)

Package outline dimensions

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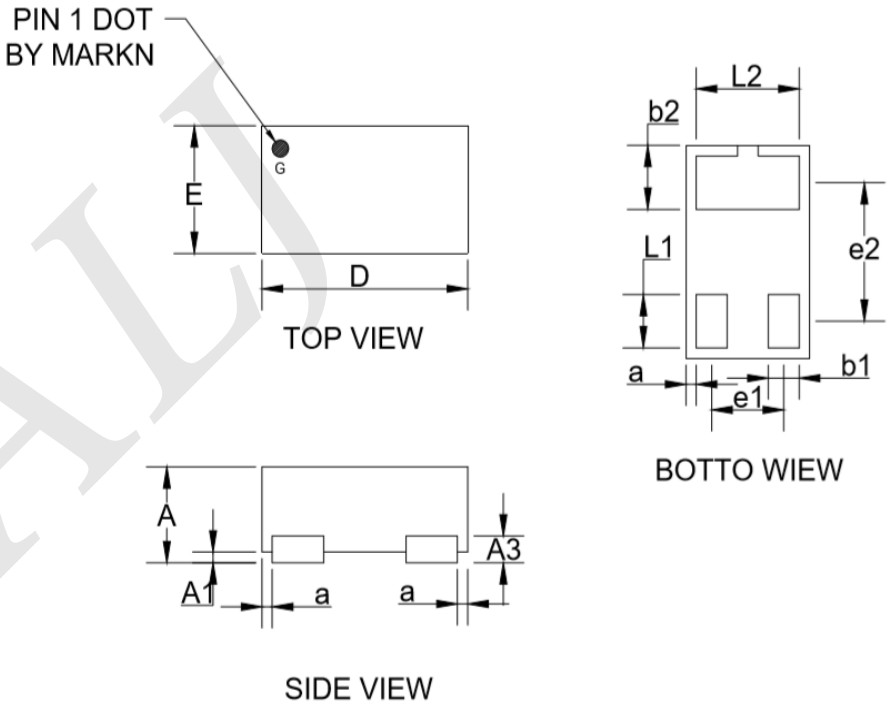
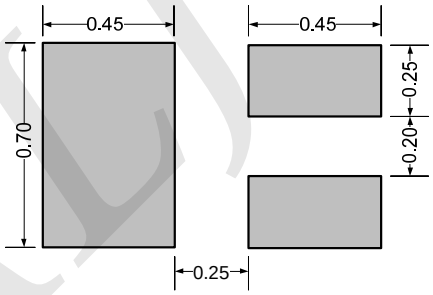


COMMON DIMENSIONS(MM)			
PKG.	X1: EXTREME THIN		
REF.	MIN.	NOM.	MAX
A	>0.40	–	0.50
A1	0.00	–	0.05
A3	0.125 REF.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
L1	0.20	0.25	0.30
L2	0.40	0.50	0.60
a	–	–	0.05
e1	0.35 BSC		
e2	0.65 BSC		

Recommend land pattern (Unit: mm)



Note: This land pattern is for your reference only. Actual pad layouts may vary depending on application.