LMNN7002T Dual N-Channel Enhancement Mode MOSFET

Features

- 60V/0.5A, $R_{DS(ON)}$=3.0Ω@V_{GS}=10V
- 60V/0.2A, $R_{DS(ON)}$=4.0Ω@V_{GS}=4.5V
- 60V/0.05A, $R_{DS(ON)}$=6.5Ω@V_{GS}=3V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-363 package design
- With ESD protection

Product Description

The LMNN7002T is the Dual N-Channel enhancement mode field effect transistors are produced using high cell density DMOS technology.

These products have been designed to minimize on-state resistance while provide rugged, reliable, and fast switching performance.

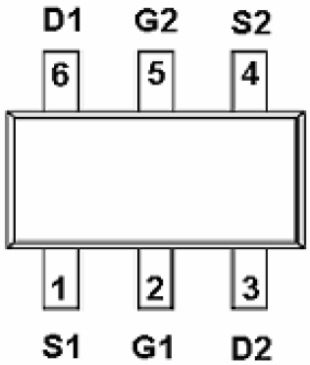
These products are particularly suited for low voltage, low current applications such as small servo motor control, power MOSFET gate drivers, and other switching applications.

Applications

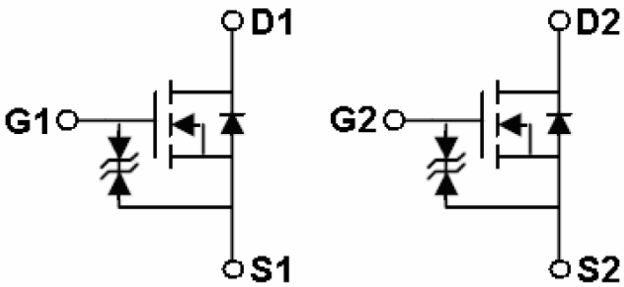
- Drivers: Relays, Solenoids, Lamps, Hammers, Display, Memories, Transistors, etc.
- High saturation current capability. Direct Logic-Level Interface: TTL/CMOS
- Battery Operated Systems
- Solid-State Relays

Pin Configuration

LMNN7002T X6F (SOT-363)



PIN	Description
1	Source 1
2	Gate 1
3	Drain 2
4	Source 2
5	Gate 2
6	Drain 1



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Ordering Information

Ordering Information				
Part Number	P/N	PKG code	Pb Free code	Package
LMNN7002T X6F	LMNN7002T	X6	F	SOT-363

Marking Information

Marking Information	
Part Number	LFC code
702	W

Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	0.23	A
		T_A=70℃	0.18	
I_{DM}	Pulsed Drain Current[1]		0.95	A
P_D	Power Dissipation	T_A=25℃	0.3	W
		T_A=70℃	0.19	
T_J	Operating Junction Temperature		-55 to +150	℃
T_{STG}	Storage Temperature Range		-55 to +150	℃
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		417	℃/W

1) Pulse width limited by safe operating area.

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Electrical Characteristics

(T_C=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	60			V
$V_{GS\ (th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1		2.5	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±10	uA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V, T_J=25ºC			1	uA
		V_{DS}=60V, V_{GS}=0V, T_J=70ºC			30	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=500mA			3	Ω
		V_{GS}=4.5V, I_D=200mA			4	
		V_{GS}=3V, I_D=50mA			6.5	
Gfs	Forward Transconductance[1]	V_{DS}=10V, I_D=0.5A	0.1			S
V_{SD}	Diode Forward Voltage[1]	V_{GS}=0V, I_S=0.5A		0.85		V
Dynamic						
Q_g	Total Gate Charge	V_{DD}=10V, V_{GS}=4.5V, I_D=0.5A		1		nC
Q_{gs}	Gate-Source Charge			0.5		
Q_{gd}	Gate-Drain Charge			0.5		
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz			35	pF
C_{oss}	Output Capacitance				10	
C_{rss}	Reverse Transfer Capacitance				5	
$t_{d(on)}$	Turn-On Time	V_{DD}=30V, V_{GS}=10V, R_G=25Ω, I_D=0.5A, R_L=60Ω		6.7		ns
t_r				6.5		
$t_{d(off)}$	Turn-Off Time			26		
t_f				16		

Note:
1. Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %.
2. Pulse width limited by safe operating area.

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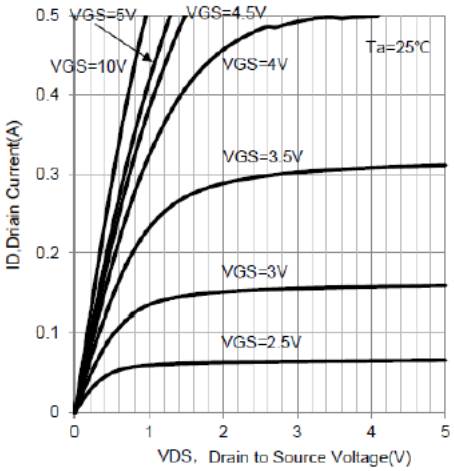
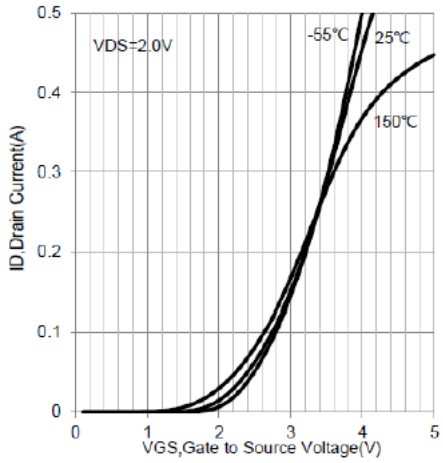
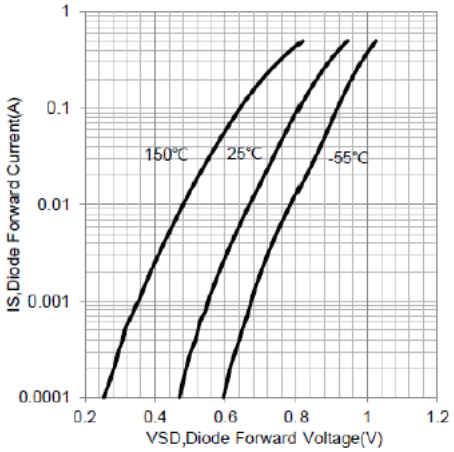
Typical Performance Characteristics



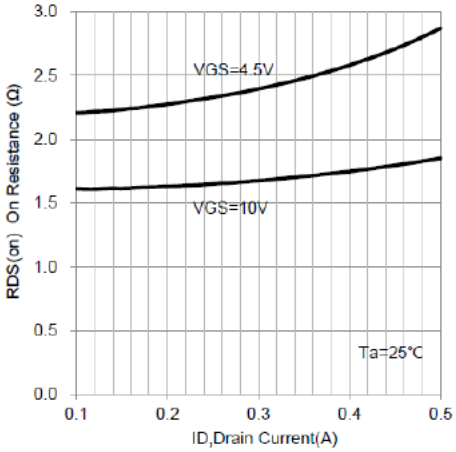
Output Characteristics



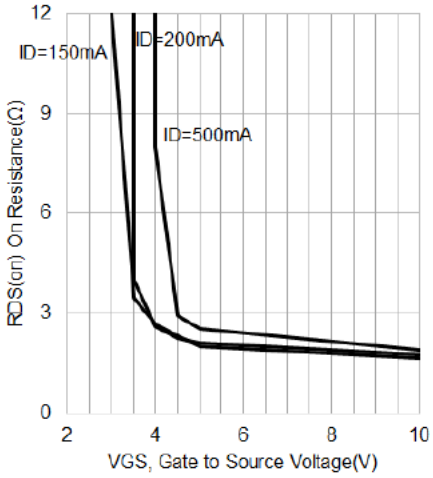
Transfer Characteristics



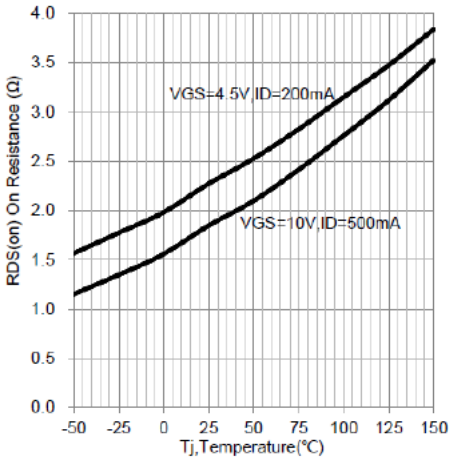
Diode Forward Current vs. Voltage



R_{DSON} vs. Continuous Drain Current



R_{DSON} vs. V_{GS}



R_{DSON} vs. T_J

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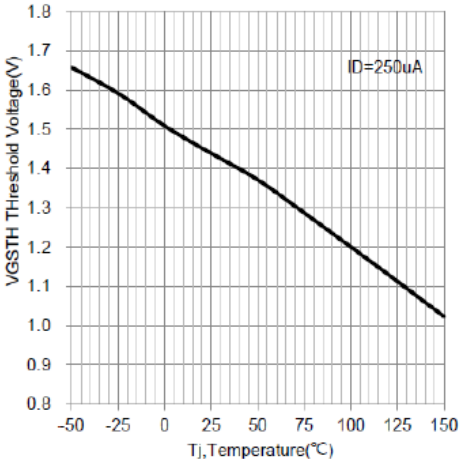
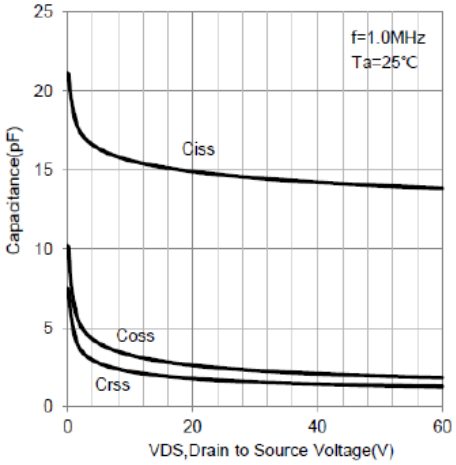
Typical Performance Characteristics(continue)



Threshold Voltage vs. T_J



Capacitance

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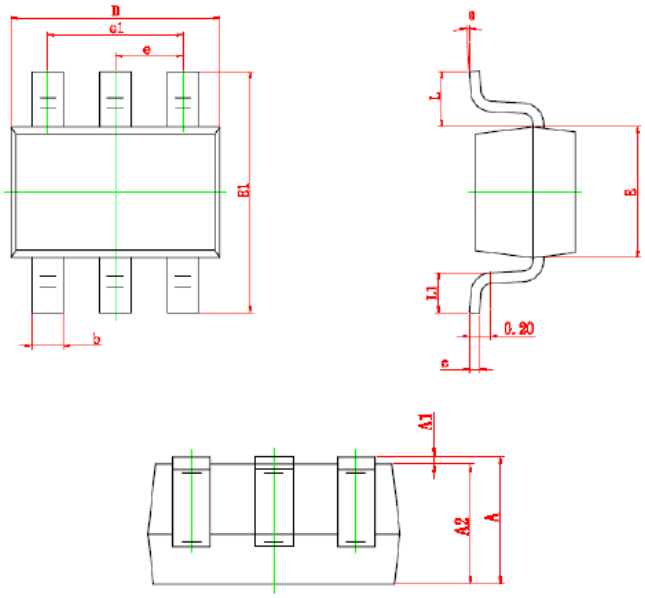
Package Dimension:

SOT-363



Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 TYP		0.021 TYP	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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