

LMN7002K 60V N-Channel Enhancement Mode MOSFET

Features

- 60V/0.5A, $R_{DS(ON)} = 2.4\Omega @ V_{GS} = 10V$
- 60V/0.3A, $R_{DS(ON)} = 3.0\Omega @ V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD Protection (2KV) Diode design-in
- SOT-23 package design

Product Description

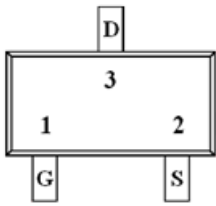
LMN7002K, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

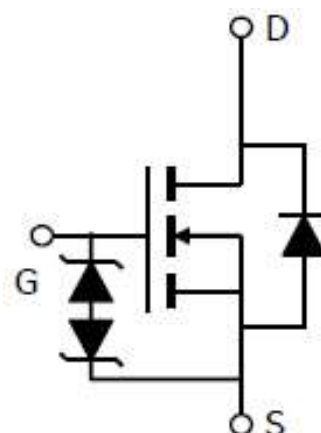
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

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

LMN7002KJZF (SOT-23)	
 Top Views	
Pin	Description
1	Gate
2	Source
3	Drain



Ordering Information

Part Number	P/N	PKG Code	Pb Free Code	Package	Quantity Reel
LMN7002KJZF	LMN7002K	JZ	F	SOT-23	3000 pcs

Marking Information

Part Marking	Part Number	LFC code
e XWMM	e	XWMM

Absolute Maximum Ratings

(T_A=25°C Unless otherwise noted)

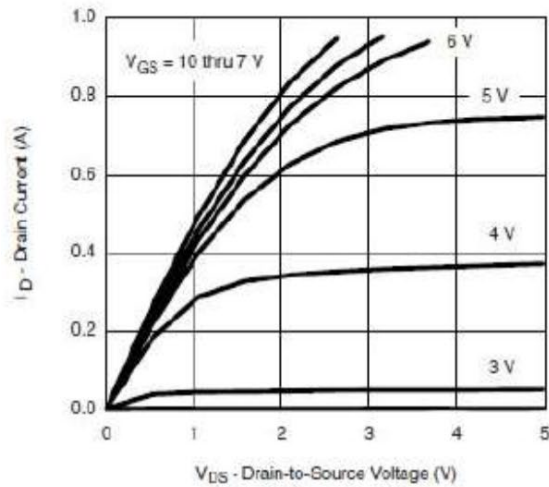
Symbol	Parameter		Typical	Unit
V _{DSS}	Drain-Source Voltage		60	V
V _{GSS}	Gate-Source Voltage		±20	V
I _D	Continuous Drain Current	T _A =25°C	0.3	A
		T _A =70°C	0.22	
I _{DM}	Pulsed Drain Current		0.65	A
I _S	Continuous Source Current(Diode Conduction)		0.45	A
P _D	Power Dissipation	T _A =25°C	0.35	W
		T _A =70°C	0.23	
T _J	Operating Junction Temperature Range		-55 to +150	°C
T _{STG}	Storage Temperature Range		-55 to +150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient		357	°C/W

Electrical Characteristics

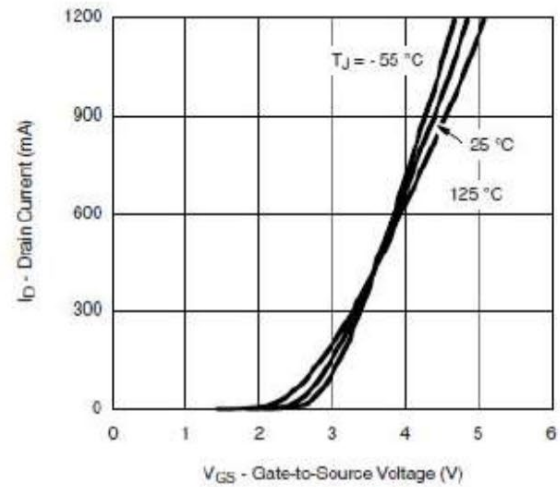
(T_A=25°C Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
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	1.0		2.0	V
I _{GSS}	Gate Leakage Current	V _{DS} =0V, V _{GS} =±20V			3	uA
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V			1	uA
		V _{DS} =60V, V _{GS} =0V, T _J =85°C			10	
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =0.5A		1.2	2.4	Ω
		V _{GS} =4.5V, I _D =0.3A		1.6	3.0	
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =0.2A		0.2		S
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =0.2A		0.75	1.4	V
Dynamic						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz		30		pF
C _{oss}	Output Capacitance			8		
C _{rss}	Reverse Transfer Capacitance			5		
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =0.25A		500		pC
Q _{gs}	Gate-Source Charge			100		
Q _{gd}	Gate-Drain Charge			150		
t _{d(on)}	Turn-On Time	V _{DD} =30V, I _D =0.2A, V _{GS} =4.5V, R _L = 150Ω, R _G =10Ω		10	20	ns
T _r				35	50	
t _{d(off)}	Turn-Off Time			20	30	
T _f				40	60	

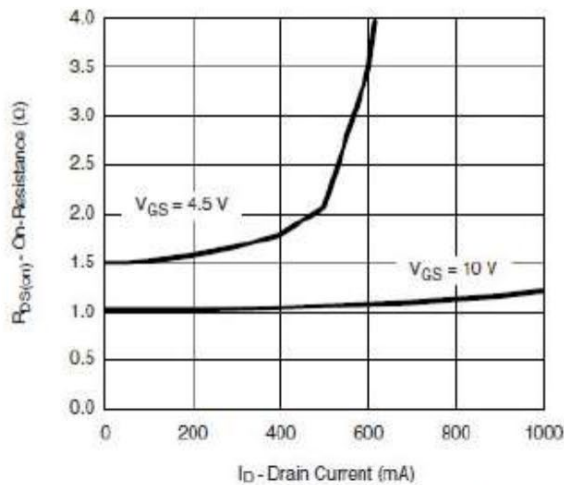
Typical Performance Characteristics



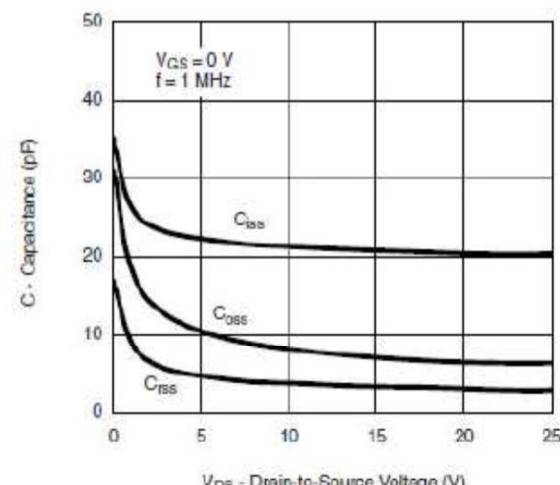
Output Characteristics



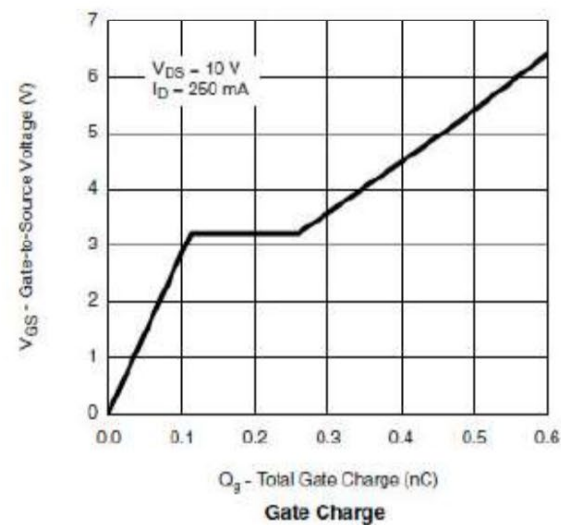
Transfer Characteristics



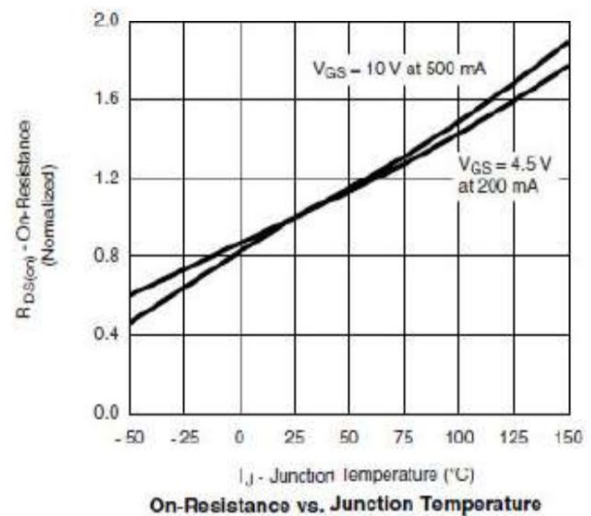
On-Resistance vs. Drain Current



Capacitance

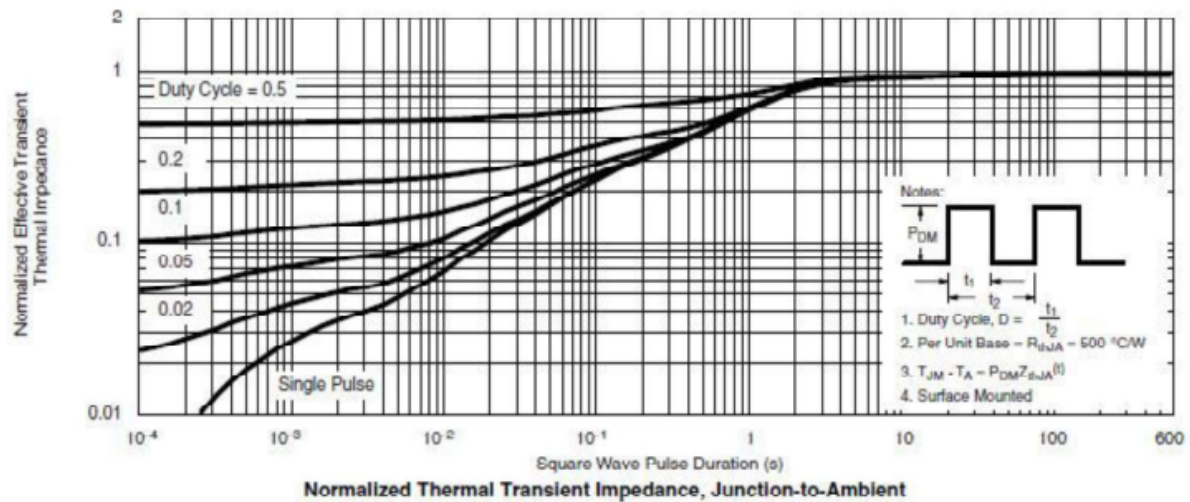
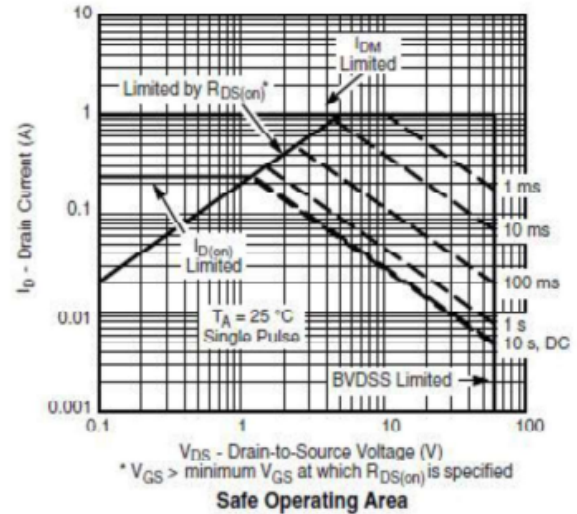
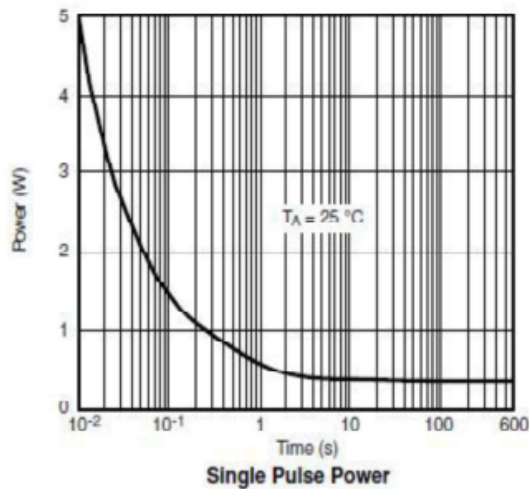
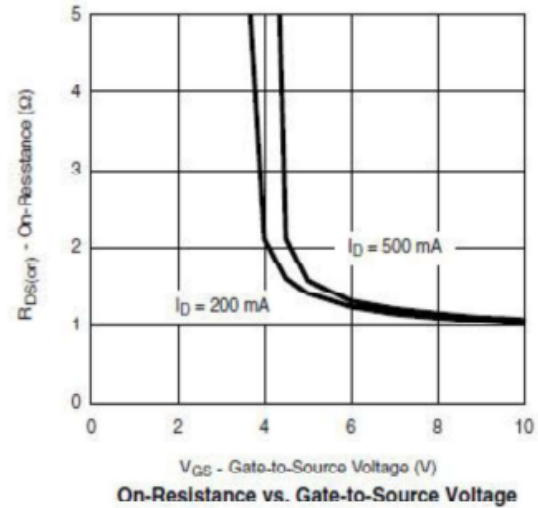
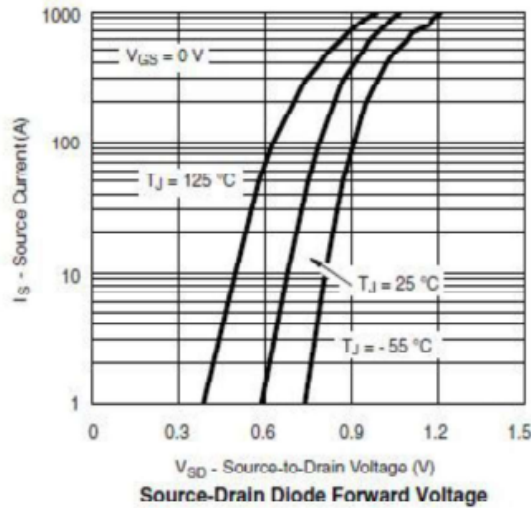


Gate Charge



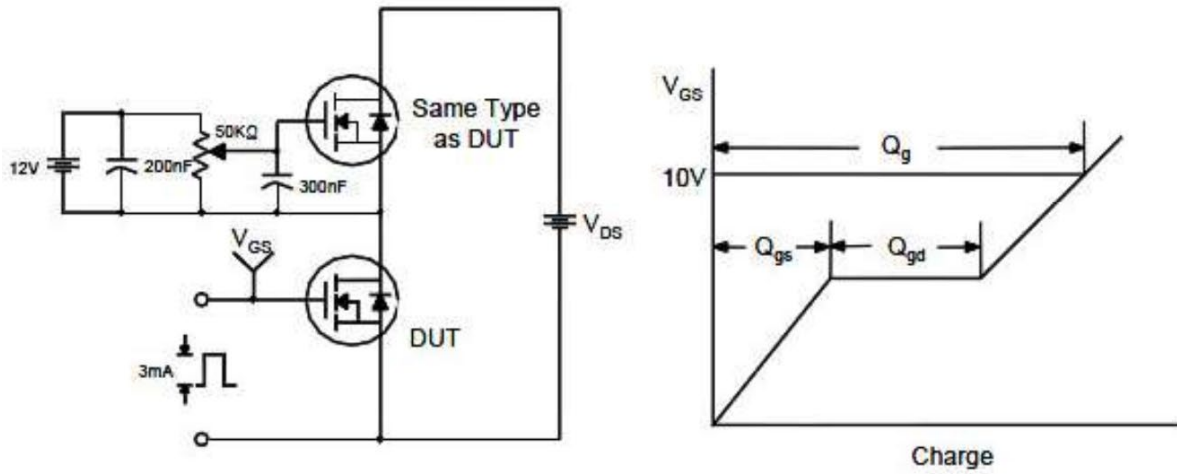
On-Resistance vs. Junction Temperature

Typical Performance Characteristics (continue.)

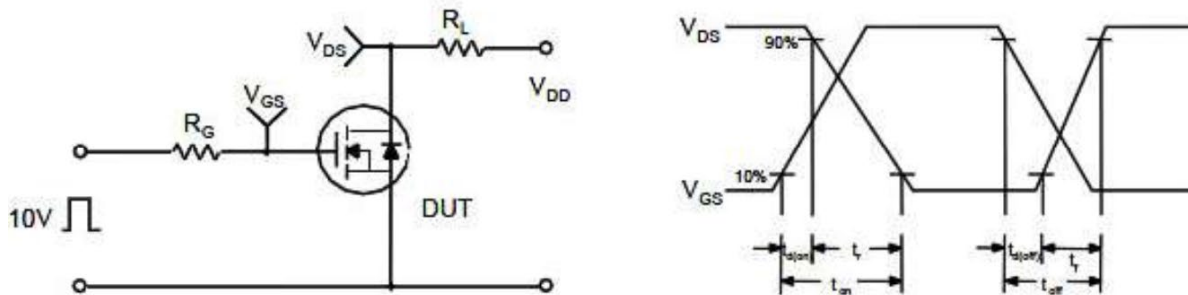


Typical Characteristics

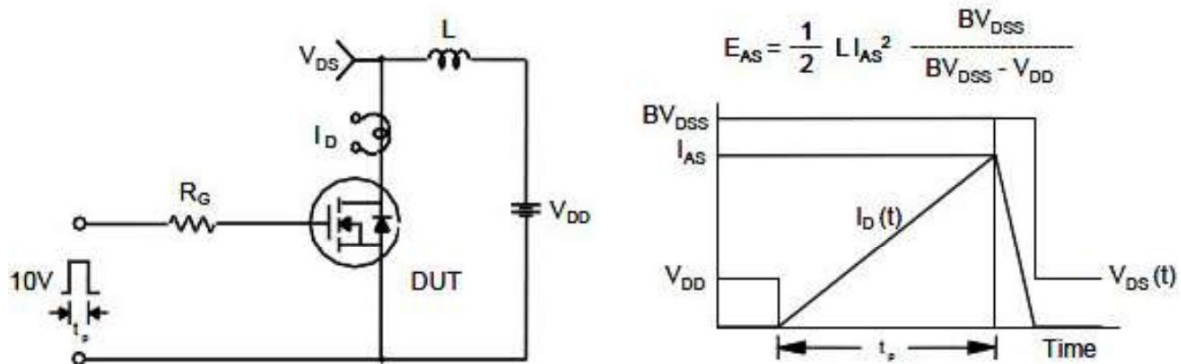
Gate Charge Test Circuit & Waveform

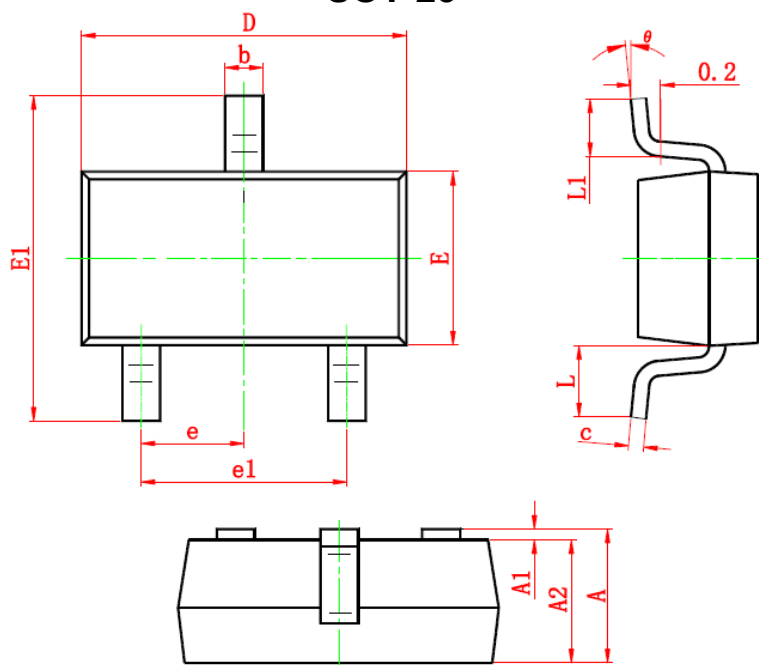


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension
SOT-23


Dimensions				
Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.200	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.100	0.035	0.039
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°