

Description

The DMP6023LEQ is the new generation trench P-ch MOSFET has been designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high efficiency power management applications

Features

- High - speed switching
- Excellent gate charge x $R_{ds(ON)}$ product (FOM)
- for extremely low $R_{DS(ON)}$
- Lead-Free, Halogen-Free; RoHS Compliant

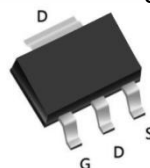
Applications

- Motor Drive
- Load Switch
- Industrial DC/DC Conversion Circuits
- Battery Protection

V_{DSS}	-60V
I_D	-3.2A
$R_{DS(ON) Typ}$	170mΩ @ $V_{GS} = -10V$

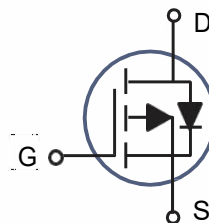
Outline

SOT-223 Pin Configuration



Equivalent

- (1) Gate
- (2) Source
- (3) Drain



Packaging specifications

Part No.	Package	Marking	Basic ordering unit.(pcs)
DMP6023LEQ	SOT-223		2500

Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous ^(Note2)	$T_C = 25^\circ C$	I_D	-3.2	A
	$T_C = 70^\circ C$		-2.56	A
-Pulsed ^(Note 1, Note 2)		I_{DM}	-12.8	A
Maximum Power Dissipation	$T_C = 25^\circ C$	P_D	2	W
	$T_C = 70^\circ C$		1.3	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	61	°C /W
Thermal Resistance Junction-Case		$R_{\theta JC}$	8.6	°C/W

Electrical Characteristics (T_c=25 °C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D =-250uA	-60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V , V _{GS} =0V			-1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250uA	-1.0	-1.6	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V , I _D =-2A		170	220	mΩ
		V _{GS} =-4.5V , I _D =-1.5A		225	270	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-10V , I _D =-2A		3.2		S
DYNAMIC CHARACTERISTICS Note4						
Input Capacitance	C _{ISS}	V _{DS} =-30V , V _{GS} =0 V , f =1.0MHz		405		pF
Output Capacitance	C _{OSS}			35		pF
Reverse Transfer Capacitance	C _{RSS}			25		pF
Total Gate Charge	Q _g	V _{DS} =-30V , I _D =-1A , V _{GS} =-10V		8		nC
Gate-Source Charge	Q _{gs}			1.9		nC
Gate-Drain Charge	Q _{gd}			1.5		nC
SWITCHING CHARACTERISTICS Note4						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =-30V , I _D =-1A , V _{GS} =-10V , R _{GEN} =6 Ω		5.5		ns
Rise Time	tr			18		ns
Turn-Off Delay Time	t _{D(OFF)}			32		ns
Fall Time	tf			9.8		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =-2A		-0.79	-1.2	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Guaranteed by design,not subject to production testing.

Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. TC

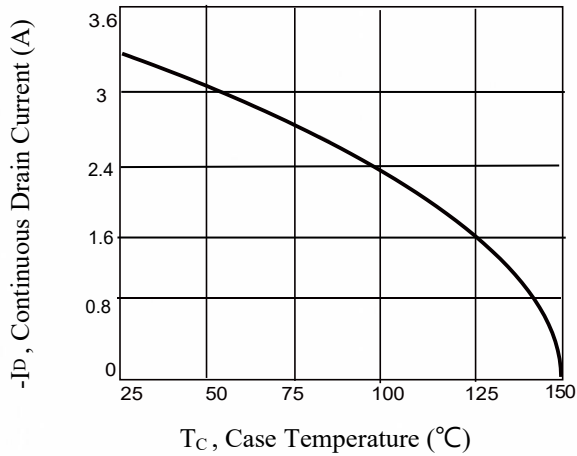


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

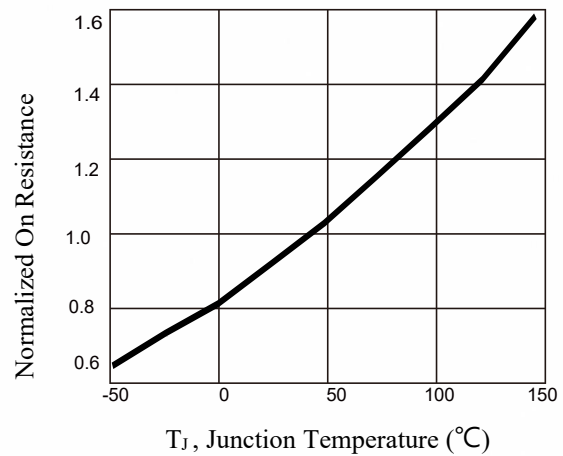


Fig.3 Normalized V_{th} vs. T_J

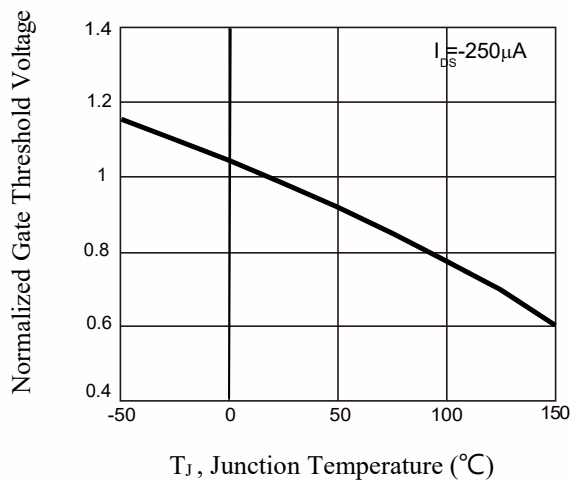


Fig.4 Gate Charge Waveform

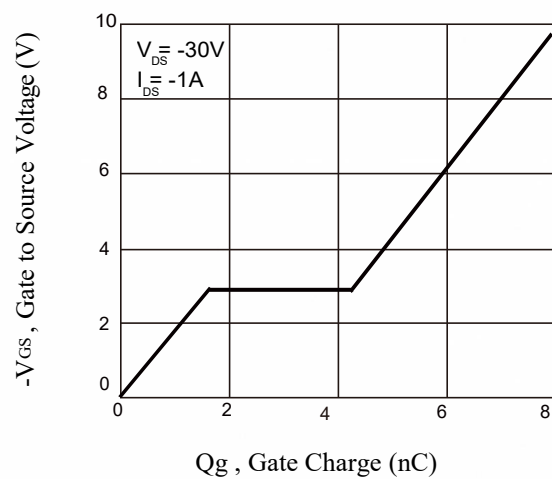


Fig.5 Typical Output Characteristics

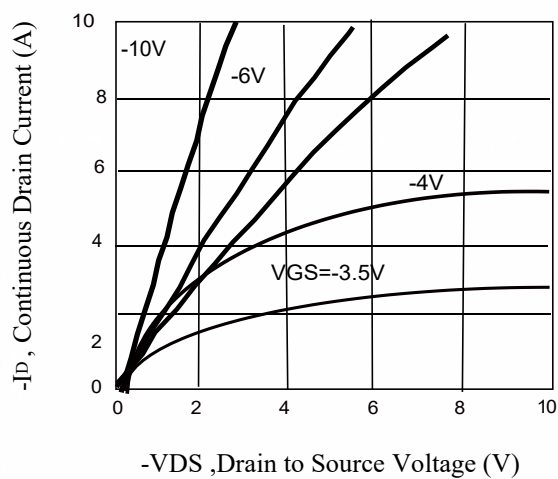


Fig.6 Turn-On Resistance vs. I_D

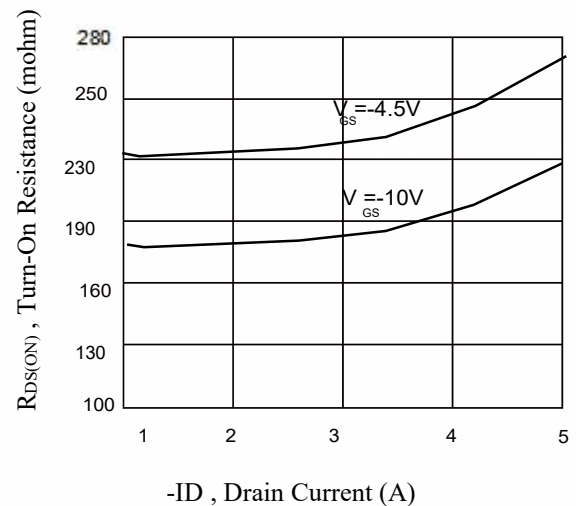


Fig.7 Capacitance

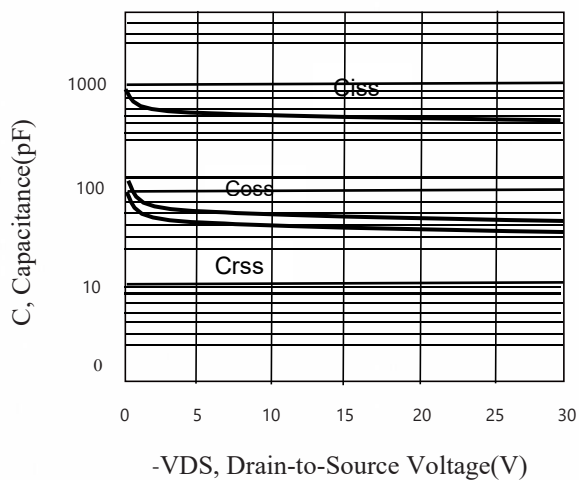


Fig.8 Typical Source-Drain Diode Forward Voltage

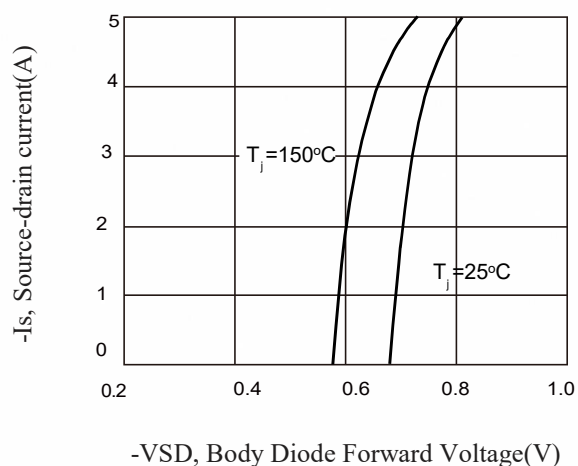


Fig.9 Normalized Transient Impedance

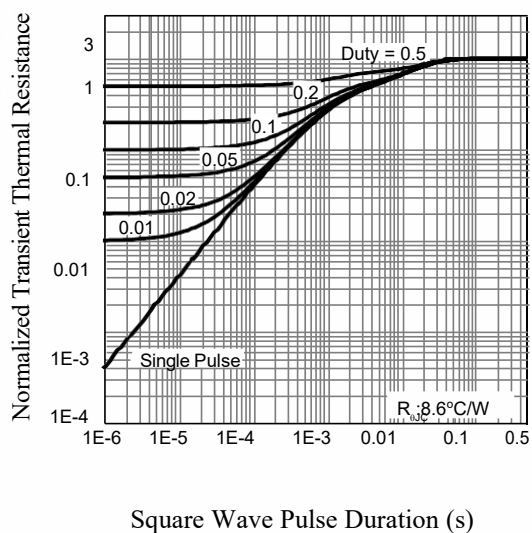


Fig.10 Maximum Safe Operation Area

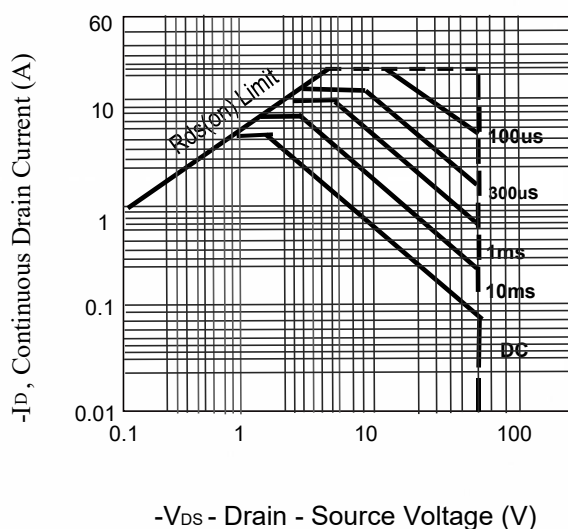


Figure11a. Switching Test Circuit

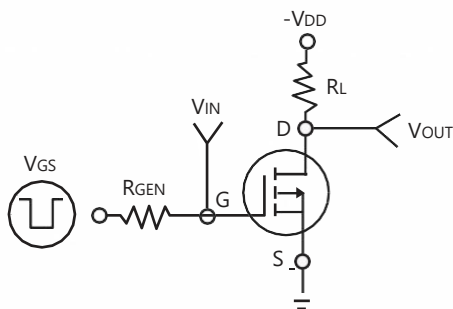
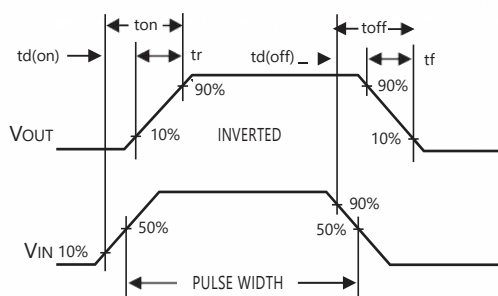
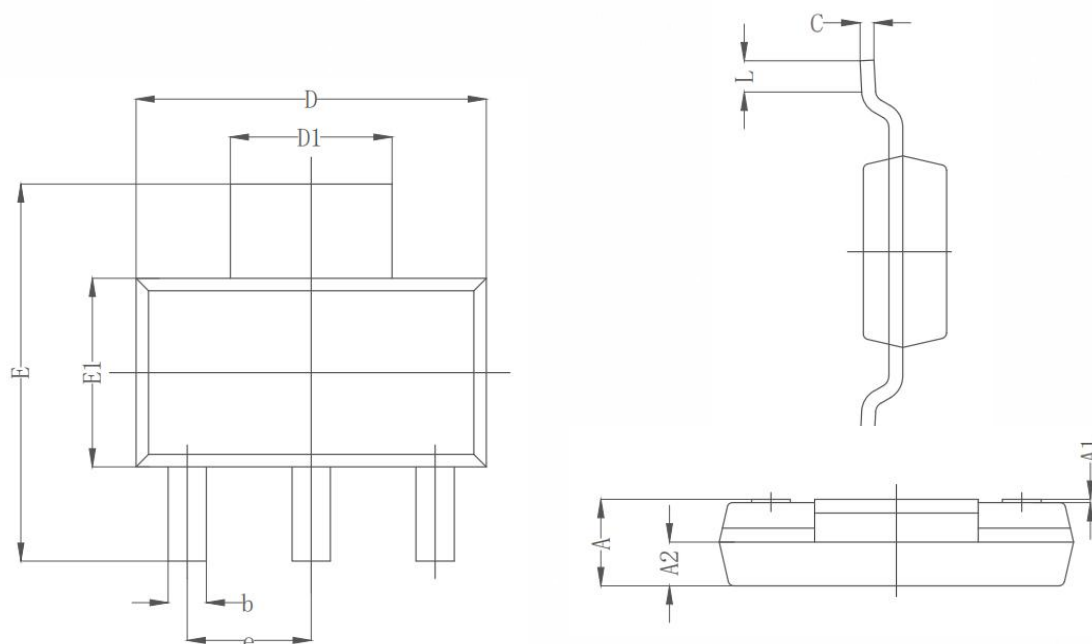


Figure11b. Switching Waveforms



SOT-223 Package Information



COMMON DIMENSION(MM)

PKG		SOT-223	
SYMBOL	MIN	TYP	MAX
A	1.520	1.580	1.720
A1	0.010	0.060	0.150
A2	0.770	0.800	0.830
b	0.660	0.710	0.800
c	0.250	0.280	0.350
D	6.500	6.600	6.750
D1	2.900	3.000	3.100
E	6.700	7.000	7.300
E1	3.300	3.500	3.700
L		0.750 REF	
e	2.275	2.300	2.325
Q	0°	4°	10°

NOTICE

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