

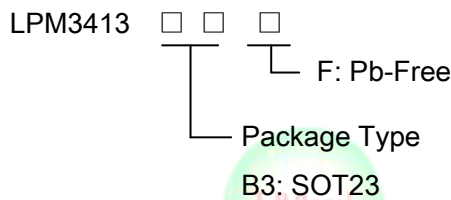


## P-Channel Enhancement Mode Field Effect Transistor

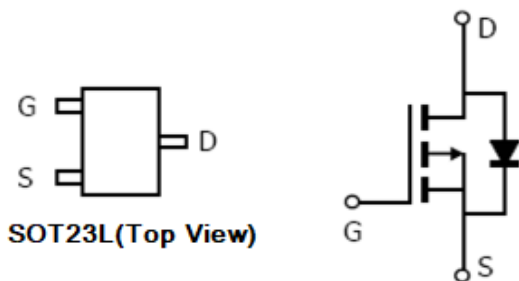
### General Description

The LPM3413 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ . This device is suitable for using as a load switch or in PWM applications. Standard Product LPM3413 is Pb-free. LPM3413 is a Green Product ordering option. LPM3413 are electrically identical.

### Order Information



### Pin Configurations



### Features

- ◆  $-20V/2.0A, R_{DS(ON)} \leq 130m\Omega(max.)@VGS=-2.5V$
- ◆  $-20V/3A, R_{DS(ON)} \leq 95m\Omega(max.)@VGS=-4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ SOT23 Package

### Applications

- ◇ Portable Media Players/MP3 players
- ◇ Cellular and Smart mobile phone
- ◇ LCD
- ◇ DSC Sensor
- ◇ Wireless Card

### Marking Information

Device	Marking	Package	Shipping
LPM3413	A1XX	SOT23	3K/REEL

### Pin Description

Pin Number	Pin Description
1	Gate Pin
2	Source Pin
3	Drain Pin



## Absolute Maximum Ratings

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		$V_{DS}$	-20	V
Gate-Source Voltage		$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	$I_D$	-3	A
	$T_A=70^\circ\text{C}$		-2.0	
Pulsed Drain Current		$I_{DM}$	-10	
Power Dissipation	$T_A=25^\circ\text{C}$	$P_D$	1.4	W
	$T_A=70^\circ\text{C}$		0.9	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

## Thermal resistance ratings

Parameter	Symbol	Typ.	Units
Maximum Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C/W}$





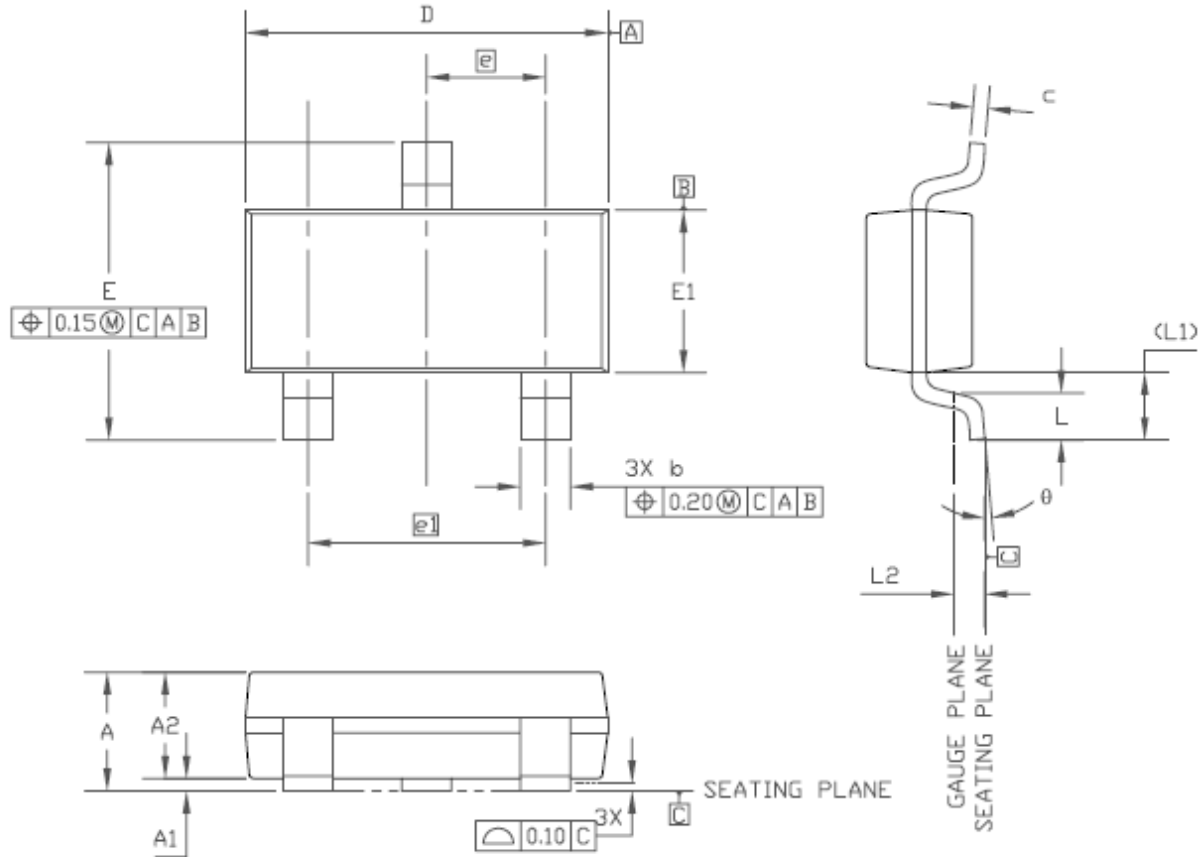
## Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ.	Max	Units
<b>STATIC PARAMETERS</b>						
BVDSS	Drain-Source Breakdown Voltage	$I_D=-250\mu A, V_{GS}=0V$	-20			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ C$ $T_J=55^\circ C$			-1 -5	$\mu A$
$I_{GSS}$	Gate-Body leakage current	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3	-0.55	-1	V
$I_{D(ON)}$	On state drain current	$V_{GS}=-4.5V$		-3		A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-3A$		81	95	m $\Omega$
		$V_{GS}=-2.5V, I_D=-2.0A$		108	130	m $\Omega$
		$V_{GS}=-1.8V, I_D=-1A$		146	190	m $\Omega$
$g_{FS}$	Forward Trans-conductance	$V_{GS}=-4.5V, I_D=-3A$		10		S
$V_{SD}$	Diode Forward Voltage	$I_S=1A, V_{GS}=0V$		-0.7	-1	V
<b>DYNAMIC PARAMETERS</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V, f=1MHz$	500	540	660	pF
$C_{oss}$	Output Capacitance		50	75	100	pF
$C_{rss}$	Reverse Transfer Capacitance		30	50	70	pF
<b>SWITCHING PARAMETERS</b>						
$Q_g$	Total Gate Charge	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-3A$	4.8	6	7	nC
$Q_{gs}$	Gate Source Charge		1	1.3	1.6	nC
$Q_{gd}$	Gate Drain Charge		1	1.8	2.5	nC
$t_{D(on)}$	Turn-On DelayTime	$V_{GS}=-4.5V, V_{DS}=-10V, R_L=3.3\Omega, R_{GEN}=3\Omega$		10		nS
$t_r$	Turn-On Rise Time			12.5		
$t_{D(off)}$	Turn-Off DelayTime			44		
$t_f$	Turn-Off Fall Time			22		
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F=-3A, di/dt=100A/\mu s$		21		ns
$Q_{rr}$	Body Diode Reverse Recovery Charge	$I_F=-3A, di/dt=100A/\mu s$		7.5		nC

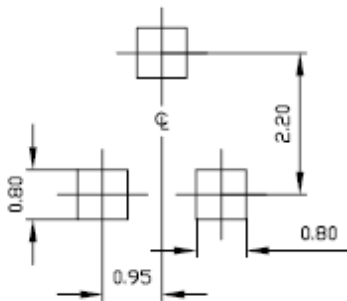


## Packaging Information

### SOT-23 STANDARD PACKAGE OUTLINE



#### RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.75	—	1.17	0.030	—	0.046
A1	0.05	—	0.15	0.002	—	0.006
A2	0.70	0.85	1.02	0.028	0.033	0.040
b	0.30	—	0.50	0.012	—	0.020
c	0.08	—	0.20	0.003	—	0.008
D	2.80	2.90	3.04	0.110	0.114	0.120
E	2.10	—	2.64	0.083	—	0.104
E1	1.20	1.30	1.40	0.047	0.051	0.055
e	0.95 BSC			0.037 BSC		
e1	1.90 BSC			0.075 BSC		
L	0.40	0.50	0.60	0.016	0.020	0.024
L1	0.54 REF			0.021 REF		
L2	0.25			0.010		
θ1	0°	—	8°	0°	—	8°