Document: T20241126, Rev: A

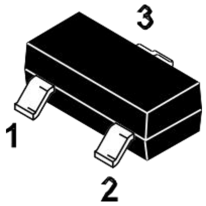
TN3415PSA

P-Channel Enhancement Mode Power MOSFET

Features

- Low gate chargre
- High density cell design for ultra low $R_{DS(on)}$
- ESD protected(HBM) up to 2KV
- V_{DS}= -20V,I_D= -4A
  $R_{DS(on)}$< 50mΩ @V_{GS}= -4.5V

SOT-23



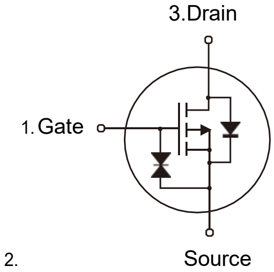
1. Gate 2.Source 3.Drain

Marking Code:3415K

Applications

- PWM applications
- Load switch
- Power management

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	20	V
Gate-Source Voltage	V_{GS}	±8	V
Drain Current-Continuous	$-I_D$	4	A
Maximum Power Dissipation	P_D	0.9	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note1	$R_{\theta JA}$	139	°C/W

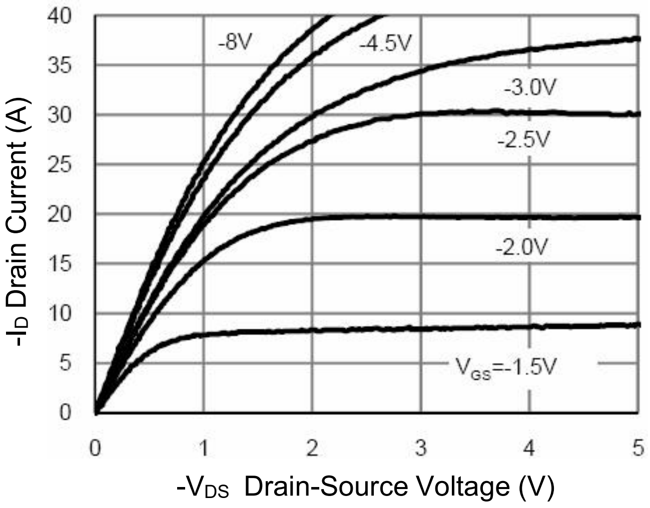
Electrical Characteristics

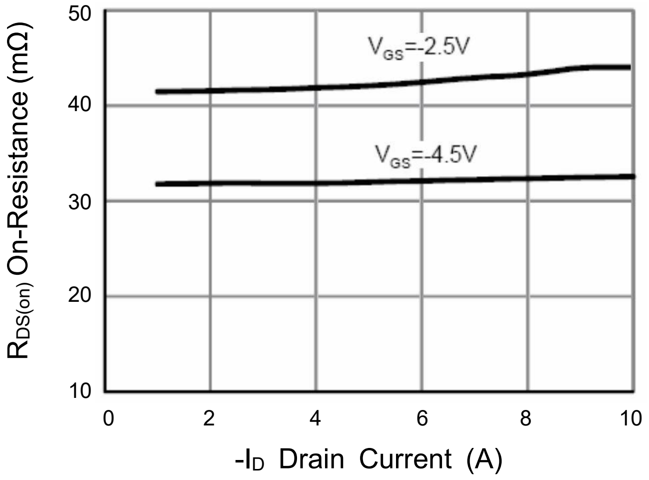
(Ta=25℃ unless otherwise specified)

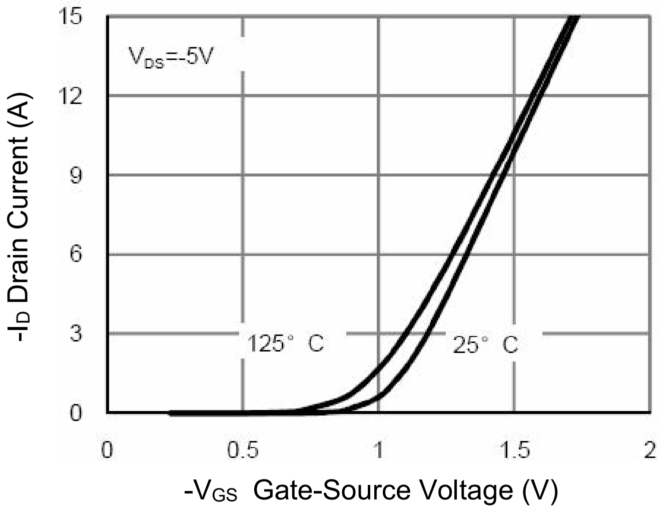
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$-V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	20	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	V_{DS}=-20V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±8V,V_{DS}=0V	--	--	±10	μA
Gate Threshold Voltage Note2	$-V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	0.3	0.65	1	V
Drain-Source On-Resistance Note2	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-4A	--	33	50	mΩ
		V_{GS}=-2.5V,I_D=-4A	--	42	60	mΩ
Forward Transconductance Note2	g_{FS}	V_{DS}=-5V,I_D=-4A	8	--	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHz	--	1181.1	--	pF
Output Capacitance	C_{oss}		--	121.3	--	pF
Reverse Transfer Capacitance	C_{rss}		--	114.8	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V,R_L=2. 5Ω, V_{GS}=-4.5V,R_G=3Ω	--	12	--	nS
Turn-on Rise Time	t_r		--	10	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	19	--	nS
Turn-off Fall Time	t_f		--	25	--	nS
Total Gate Charge	Q_g	V_{DS}=-10V, I_D= -4A,V_{GS}=-4.5V	--	10.2	--	nC
Gate-Source Charge	Q_{gs}		--	1.3	--	nC
Gate-Drain Charge	Q_{gd}		--	2.4	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage Note2	$-V_{SD}$	V_{GS}=0V,I_S=-4A	--	--	1.2	V
Diode Forward Current Note1	$-I_S$		--	--	4	A

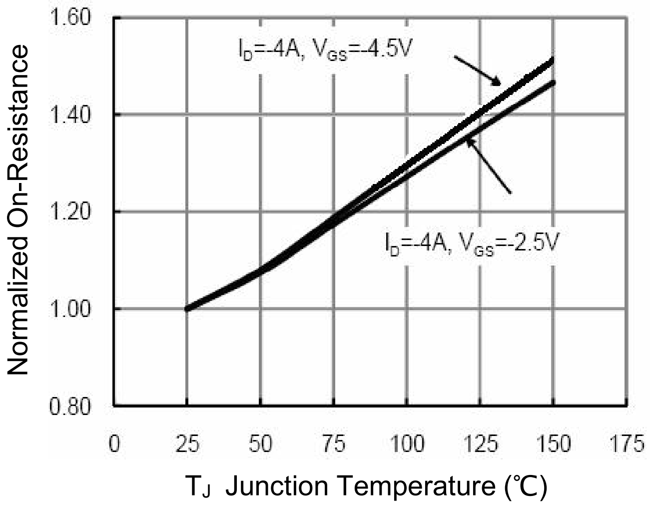
Note: 1. Surface Mounted on FR4 Board, t ≤ 10 sec.
2. Pulse Test: Pulse width≤300μs, duty cycle≤2%.

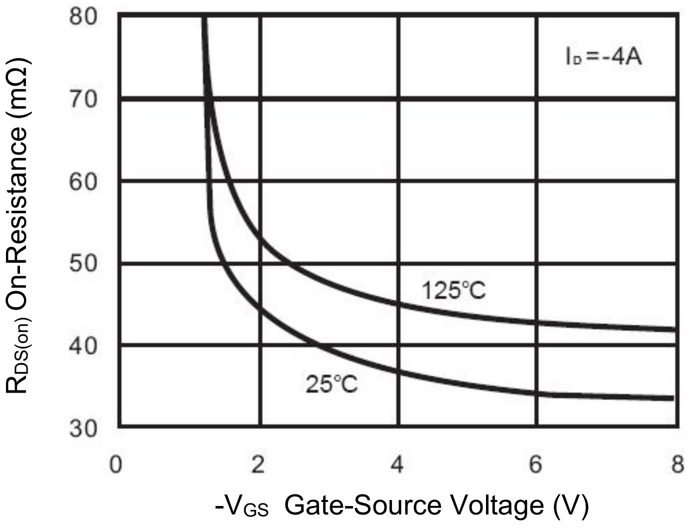
Typical Characteristic Curves

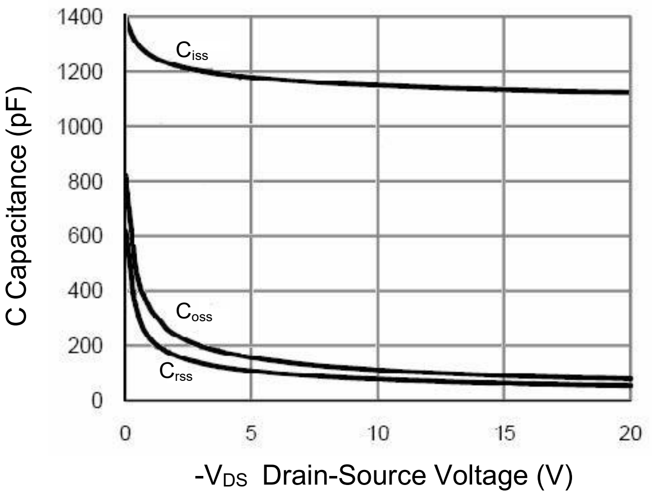


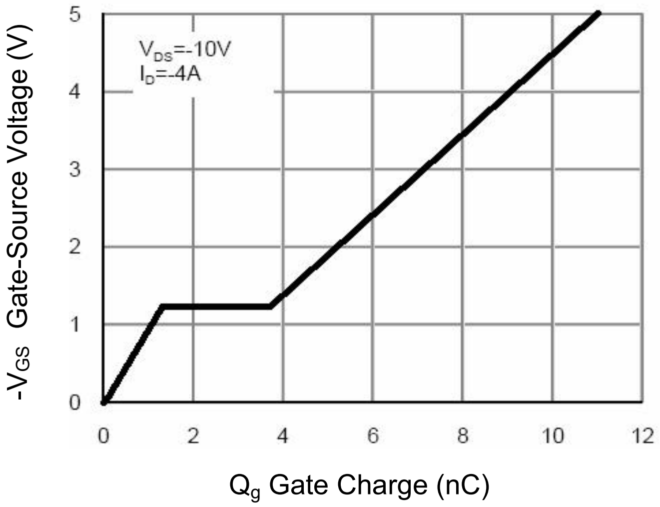


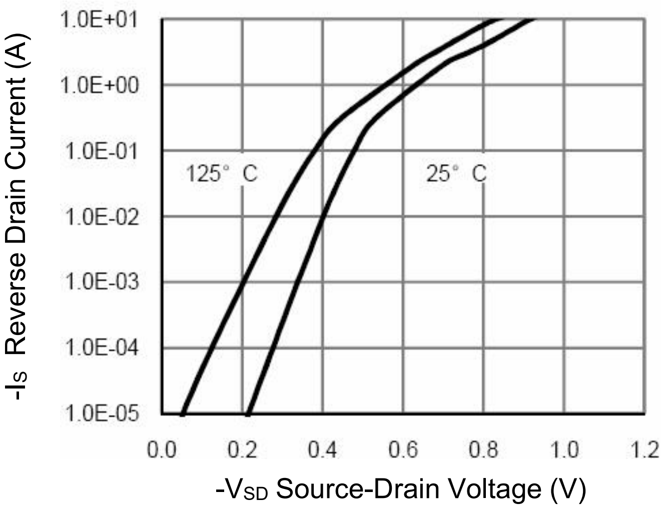






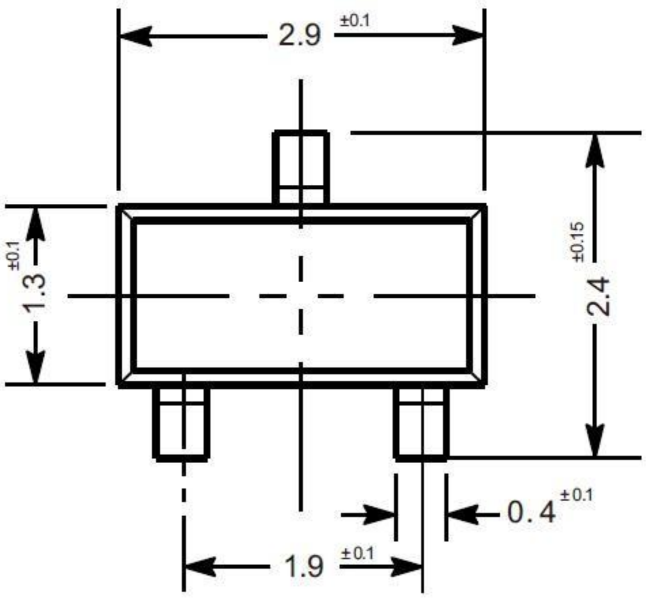


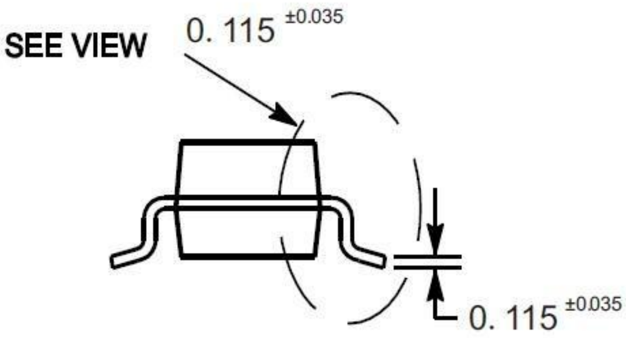

-V_{GS} Gate-Source Voltage (V)
Q_g Gate Charge (nC)
V_{DS}=-10V
I_D=-4A
0
1
2
3
4
5
0
2
4
6
8
10
12

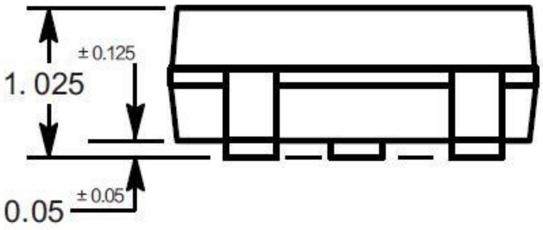

-I_S Reverse Drain Current (A)
-V_{SD} Source-Drain Voltage (V)
125° C
25° C
1.0E+01
1.0E+00
1.0E-01
1.0E-02
1.0E-03
1.0E-04
1.0E-05
0.0
0.2
0.4
0.6
0.8
1.0
1.2

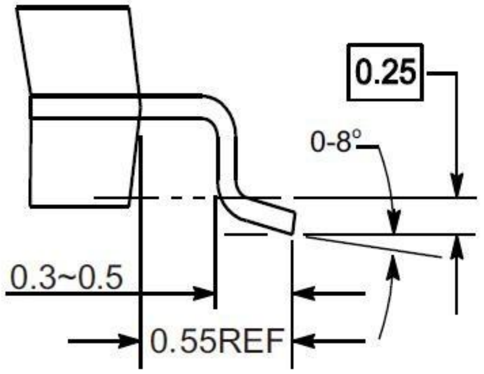
Package Outline

SOT-23
Dimensions in mm









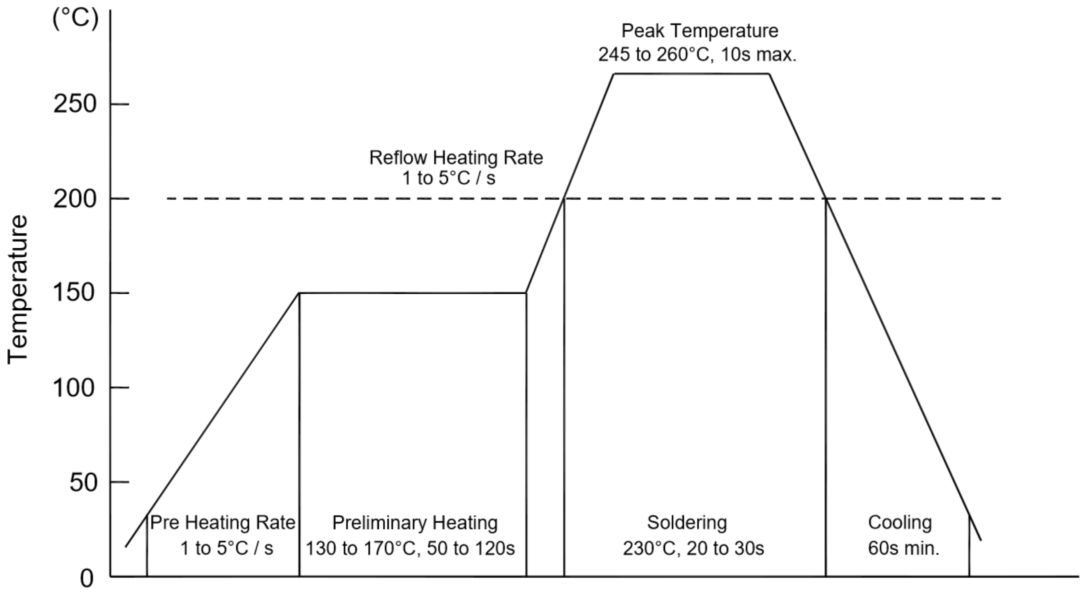
VIEW C

Ordering Information

Device	Package	Shipping
TN3415PSA	SOT-23	3,000PCS/Reel&7inches

Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245 °C. If peak temperature is below 245 °C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

◆ Conditions of hand soldering

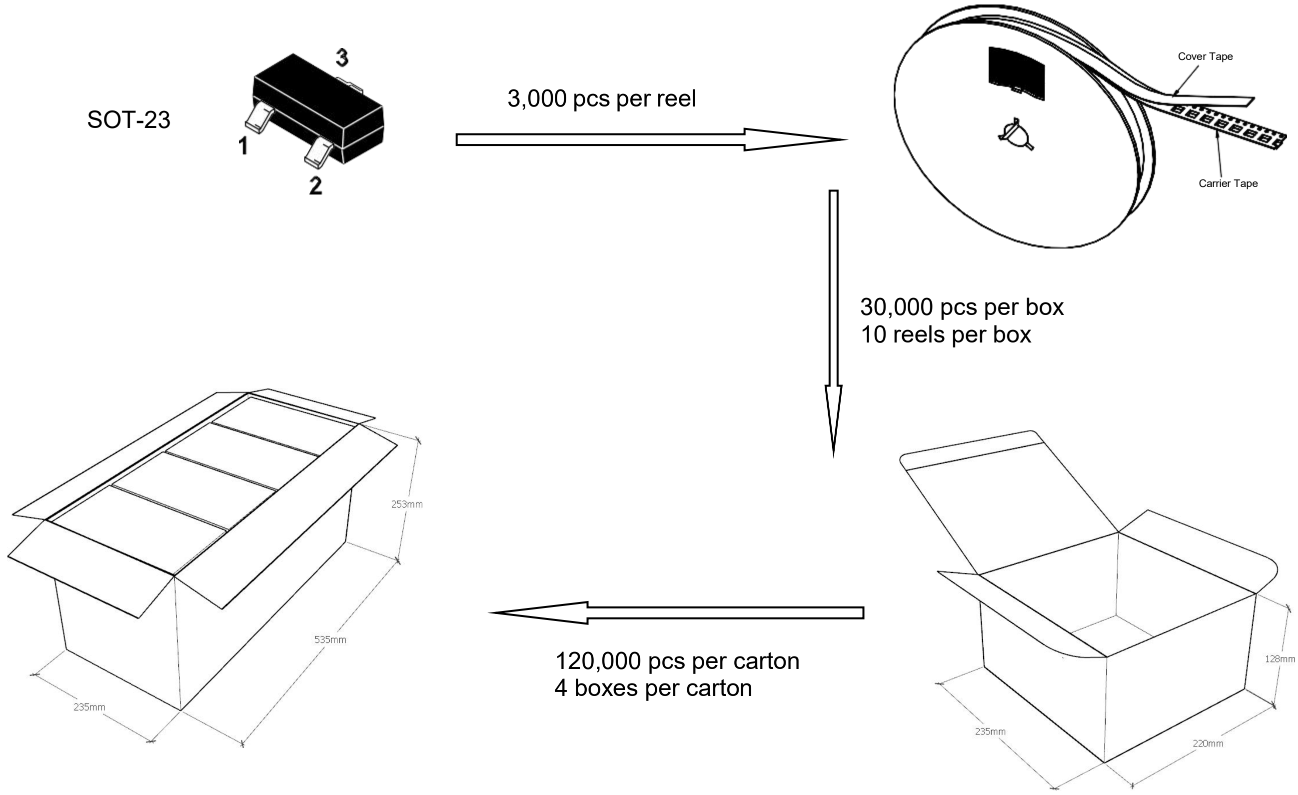
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

◆ Storage conditions

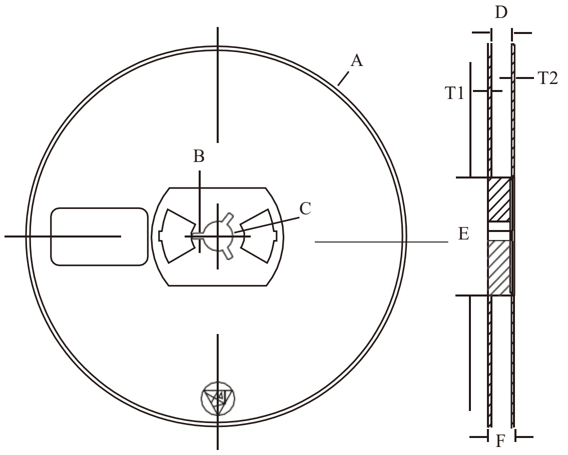
- **Temperature**
  5 to 40 °C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging



◆ **Embossed tape and reel data**



Reel (7")

Symbol	Value (unit: mm)
A	Ø 177.8±1
B	2.7±0.2
C	Ø 13.5±0.2
E	Ø 54.5±0.2
F	12.3±0.3
D	9.6+2/-0.3
T1	1.0±0.2
T2	1.2±0.2