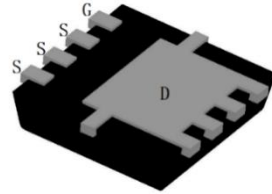


**FEATURES**

- Drain-Source Withstand Voltage: 60V
- Max.  $R_{DS(on)}$  : 29 m $\Omega$  @  $V_{GS}=10V$
- Automotive applications
- AEC-Q101 Qualified
- Excellent ON resistance
- General footprint package PDFN3333-8L
- 100% Rg and Avalanche tested
- MSL1

**PRODUCT APPEARANCE**

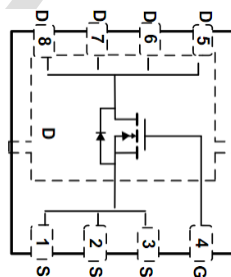
PDFN3333-8L

**DESCRIPTION**

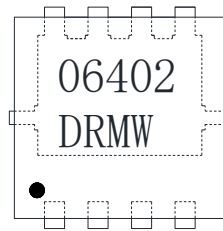
The SNM0629DRAQ is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is suitable for use in high performance automotive DC-DC conversion, power switch and charging circuit. Standard Product SNM0629DRAQ is in compliance with RoHS.

**Applications:**

- Automotive systems
- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device

**PIN CONFIGURATION**

Top view

**MARKING**


06402 = Device Code  
 DR = Special Code  
 M = Month  
 W = Week

**LIMITING VALUES**

Parameter	Symbol	Condition	Value	Unit
Drain-Source Voltage	$V_{DS}$		60	V
Gate-Source Voltage	$V_{GS}$		$\pm 20$	V
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$	23	A
		$T_C=100^\circ\text{C}$	16	A
Pulsed Drain Current <sup>(3)</sup>	$I_{DM}$		55	A
Continuous Drain Current	$I_D$	$T_A=25^\circ\text{C}$	6	A
		$T_A=100^\circ\text{C}$	5	A
Avalanche Energy $L=0.3\text{mH}$	$E_{AS}$		16	mJ
Power Dissipation <sup>(2)</sup>	$P_D$	$T_C=25^\circ\text{C}$	32	W
		$T_C=100^\circ\text{C}$	16	W
Power Dissipation <sup>(1)</sup>	$P_D$	$T_A=25^\circ\text{C}$	16	W
		$T_A=100^\circ\text{C}$	2.4	W
Operating Junction Temperature	$T_J$		-55 to 175	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$		-55 to 175	$^\circ\text{C}$

**THERMAL RESISTANCE RATINGS**

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>(1)</sup>	Steady State	R <sub>θJA</sub>	49	62	°C/W
Junction-to-Case Thermal Resistance <sup>(2)</sup>	Steady State	R <sub>θJC</sub>	3.8	4.7	

**ELECTRONICS CHARACTERISTICS**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0 V, I <sub>D</sub> = 250μA	60			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	BV <sub>DSS</sub> /T <sub>J</sub>			29		mV/°C
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> = 0V, T <sub>J</sub> =25°C			10	μA
		V <sub>DS</sub> =60V, V <sub>GS</sub> = 0V, T <sub>J</sub> =125°C			250	μA
Gate-to-source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0 V, V <sub>GS</sub> = 20V			100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> = 250μA	2.5	3.0	3.5	V
Threshold Temperature Coefficient	V <sub>GS(TH)</sub> /T <sub>J</sub>			-6.2		mV/°C
Drain-to-source On-resistance <sup>(4)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		22	29	mΩ
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> = 0V, f = 1.0MHz, V <sub>DS</sub> =25V		355		pF
Output Capacitance	C <sub>OSS</sub>			202		
Reverse Transfer Capacitance	C <sub>RSS</sub>			23		
Total Gate Charge <sup>(5)</sup>	Q <sub>G(TOT)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> = 48V, I <sub>D</sub> = 10A		6.7		nC
Gate-to-Source Charge <sup>(5)</sup>	Q <sub>GS</sub>			1.6		
Gate-to-Drain Charge <sup>(5)</sup>	Q <sub>GD</sub>			2.6		

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate Resistance	$R_g$	$f=1\text{MHz}$		1.0		$\Omega$
<b>SWITCHING CHARACTERISTICS <sup>(5)</sup></b>						
Turn-On Delay Time	$t_d(\text{ON})$	$V_{GS}=10\text{V},$ $V_{DS}=48\text{V},$ $I_D=10\text{A}, R_G=1\Omega$		3.0		ns
Rise Time	$t_r$			20		
Turn-Off Delay Time	$t_d(\text{OFF})$			4.8		
Fall Time	$t_f$			18		
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F=10\text{A},$ $dI/dt=100\text{A}/\mu\text{s}$		14		ns
Body Diode Reverse Recovery Charge	$Q_{rr}$	$I_F=10\text{A},$ $dI/dt=100\text{A}/\mu\text{s}$		2.4		nC
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage <sup>(4)</sup>	$V_{SD}$	$V_{GS}=0\text{V}, I_S=10\text{A}$	0.5	0.85	1.2	V

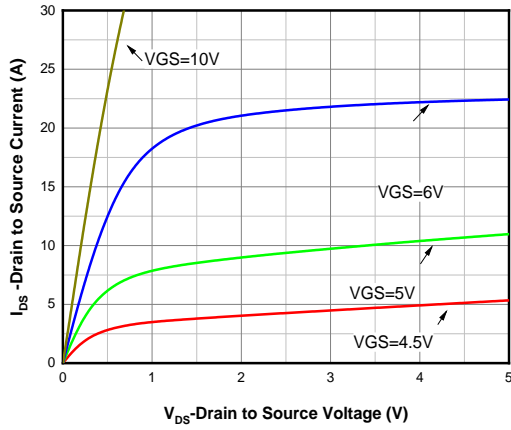
( $T_J=25^\circ\text{C}$ , unless otherwise noted.)

**Note:**

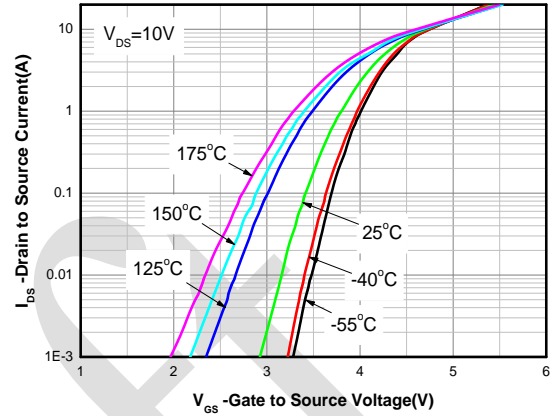
- (1) FR-4 board ( $38\text{mm} \times 38\text{mm} \times 1.6\text{mm}$ ,  $70\mu\text{m}$  Copper) partially covered with copper ( $645\text{mm}^2$  area). The power dissipation  $P_{DSM}$  is based on Junction-to-Ambient thermal resistance value and the  $T_{J(\text{MAX})}=175^\circ\text{C}$ . The value is only for reference, any application depends on the user's specific board design.
- (2) The power dissipation  $P_D$  is based on  $T_{J(\text{MAX})}=175^\circ\text{C}$ , using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
- (3) Repetitive rating, pulsed, duty cycle  $\sim 1\%$ , keep initial  $T_J=25^\circ\text{C}$ , the maximum allowed junction temperature of  $175^\circ\text{C}$ .
- (4) The static characteristics are obtained using  $\sim 380\mu\text{s}$  pulses, duty cycle  $\sim 1\%$ .
- (5) The parameter is not subject to production test – verified by design / characterization.

**TYPICAL CHARACTERISTICS**

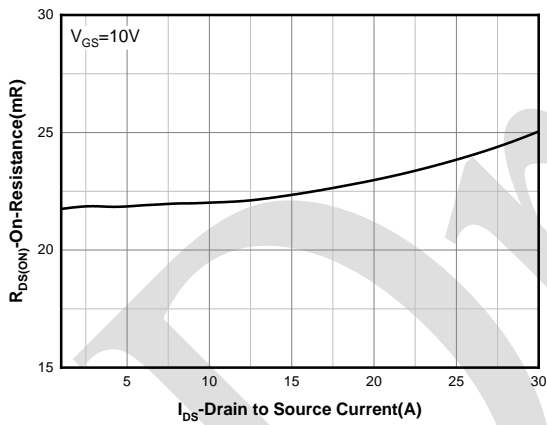
Ta=25°C, unless otherwise noted.



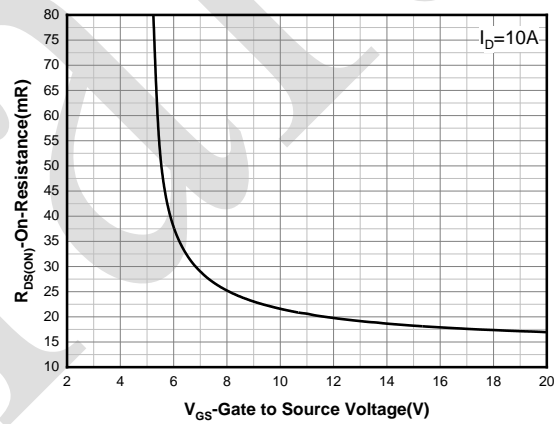
Output Characteristics <sup>(4)</sup>



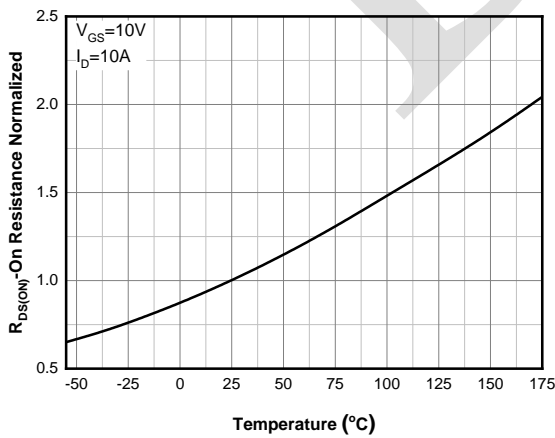
Transfer Characteristics <sup>(4)</sup>



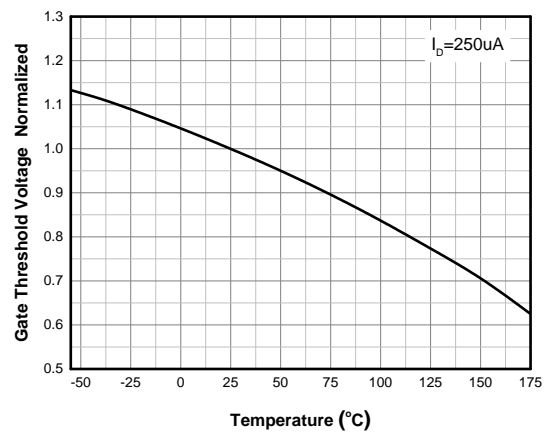
On-Resistance vs. Drain Current <sup>(4)</sup>



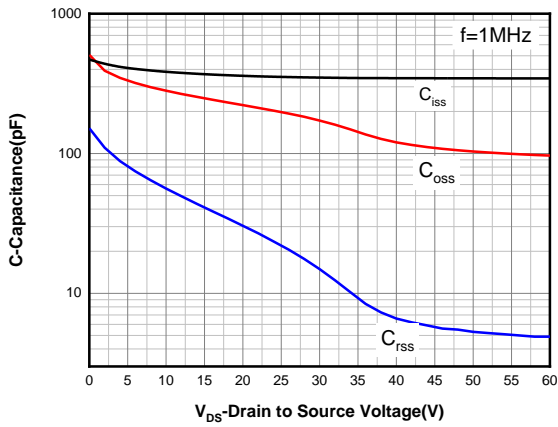
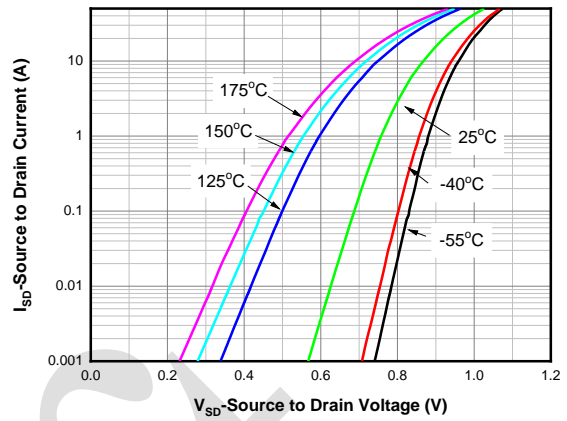
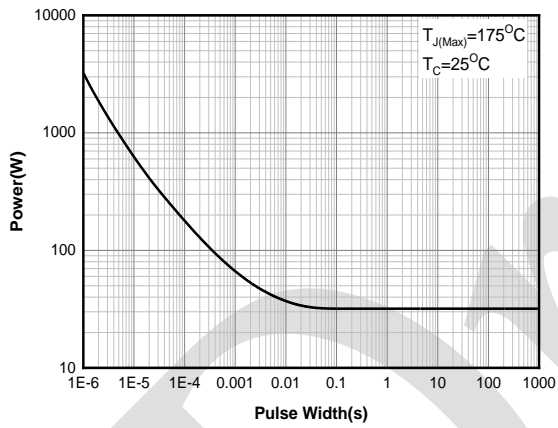
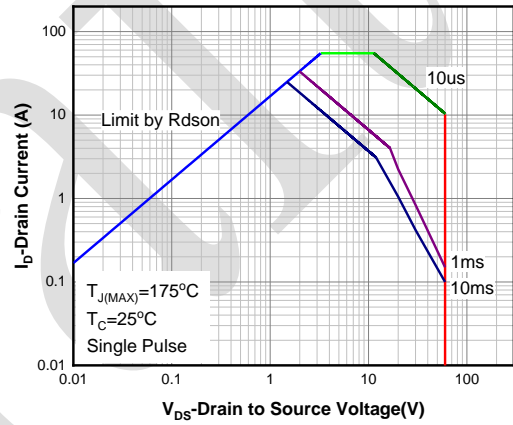
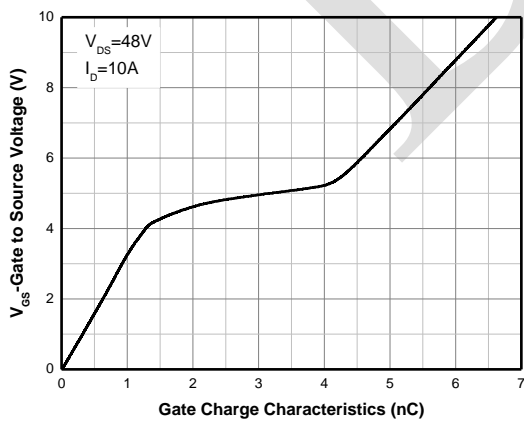
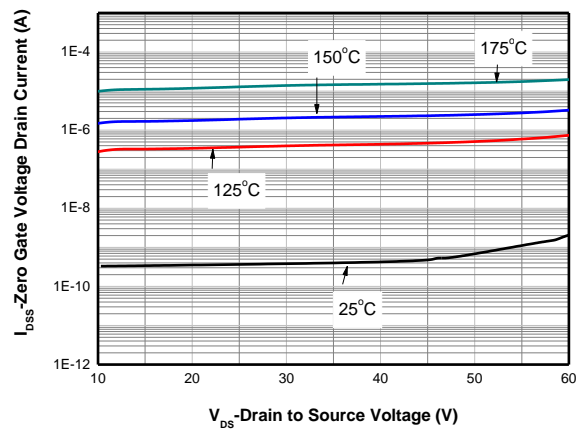
On-Resistance vs. Gate-to-Source Voltage <sup>(4)</sup>

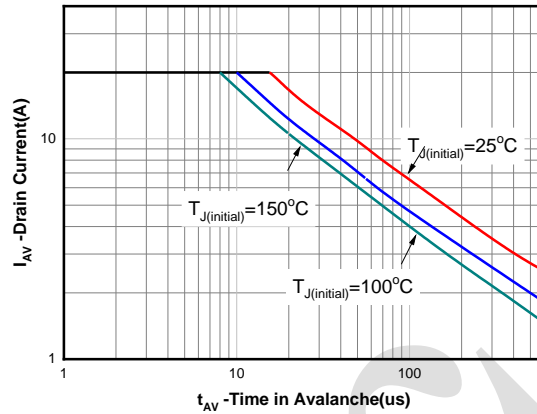
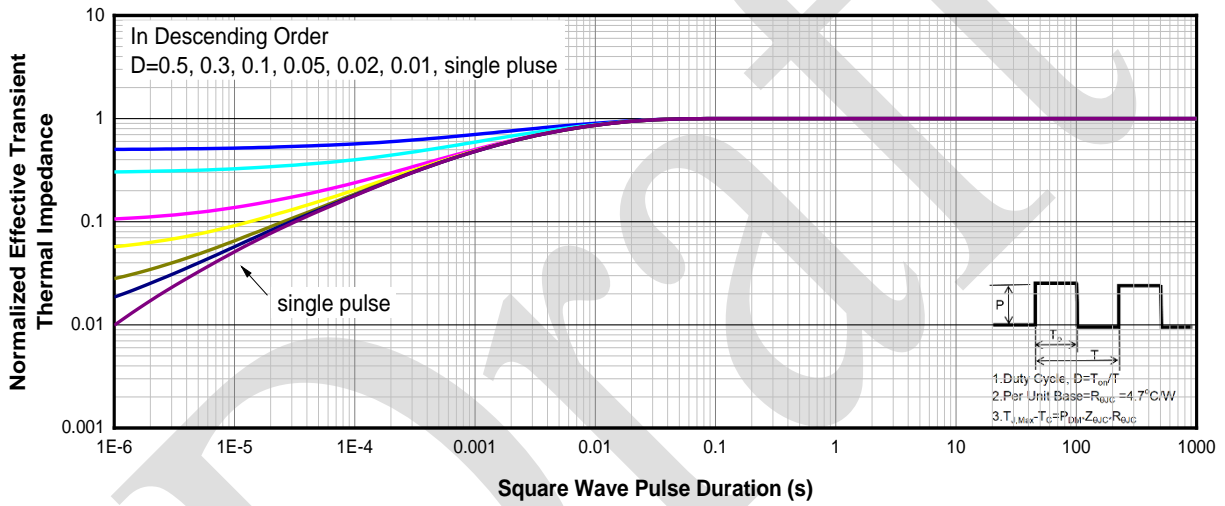
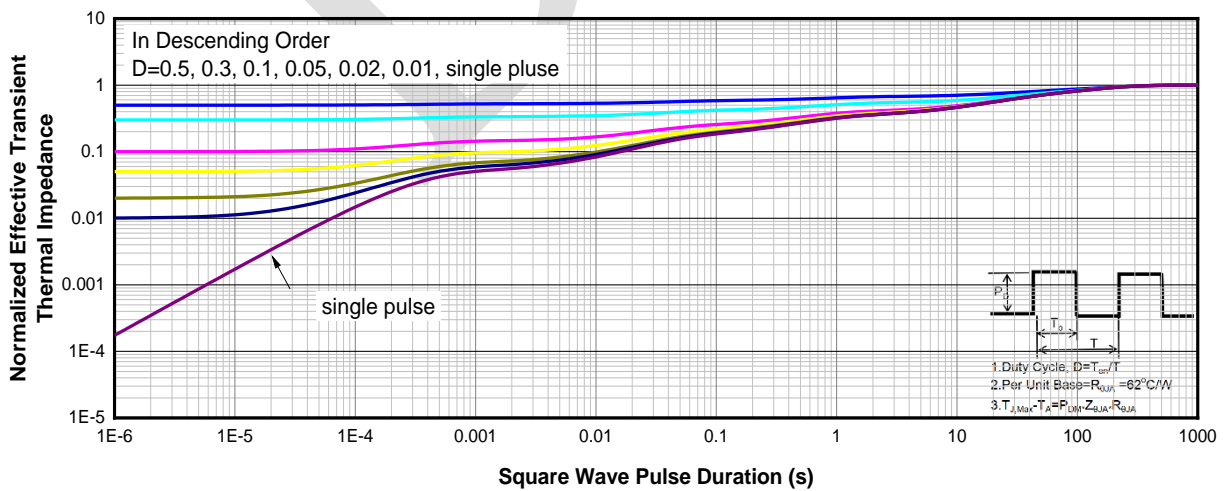


On-Resistance vs. Junction Temperature <sup>(4)</sup>



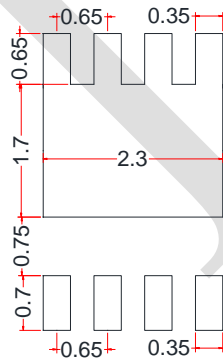
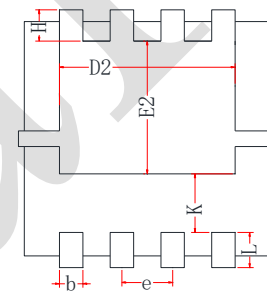
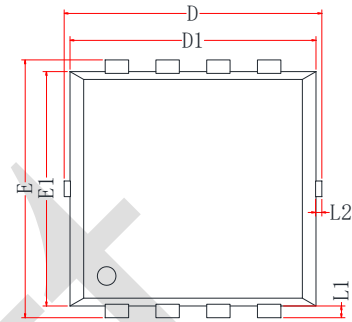
Threshold Voltage vs. Temperature


**Capacitance**

**Body Diode Forward Voltage <sup>(4)</sup>**

**Single Pulse power**

**Safe Operating Area**

**Gate Charge Characteristics**

**Drain Current vs. Drain Voltage**

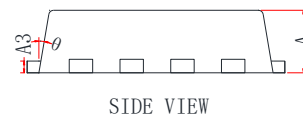

**Avalanche characteristics**

**Transient Thermal Response (Junction-to-Case)**

**Transient Thermal Response (Junction-to-Ambient)**

**PDFN3333-8L DIMENSIONS**
**PACKAGE SIZE**

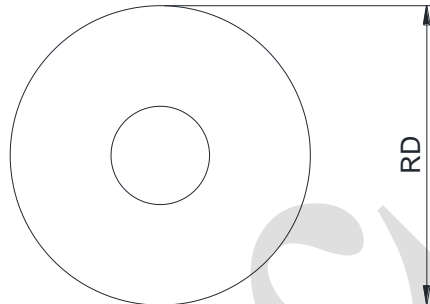
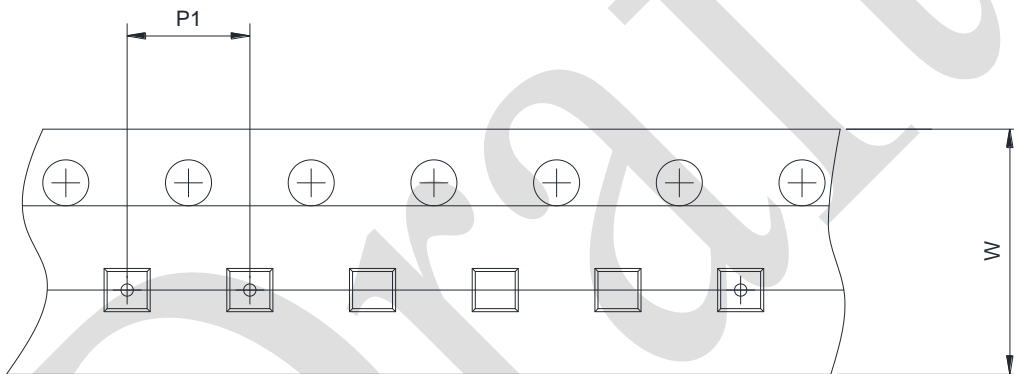
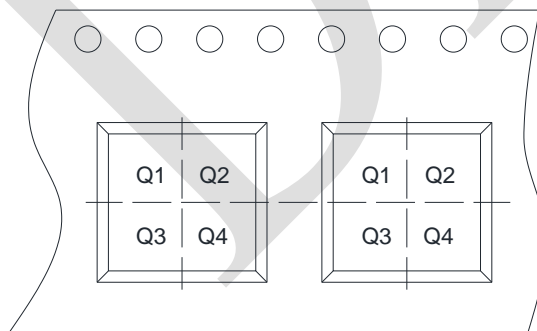
Symbol	Min.	Typ.	Max.
A	0.70	0.80	0.90
A3	0.14	0.15	0.20
b	0.25	0.30	0.39
D	3.10	3.30	3.50
D1	3.05	3.15	3.25
D2	2.15	2.25	2.35
e	0.55	0.65	0.75
E	3.10	3.30	3.50
E1	2.90	3.00	3.10
E2	1.60	1.70	1.80
H	0.25	0.40	0.55
K	0.65	0.75	0.85
L	0.30	0.45	0.60
L1	0.05	0.15	0.25
L2	-	-	0.15
$\theta$	8 °	10 °	12 °



RECOMMENDED LAND PATTERN (Unit:mm)





**TAPE AND REEL INFORMATION**
**Reel Dimensions**

**Tape Dimensions**

**Quadrant Assignments For PIN1 Orientation In Tape**


User Direction of Feed

RD	Reel Dimension	<input type="checkbox"/> 7inch	<input checked="" type="checkbox"/> 13inch		
W	Overall width of the carrier tape	<input type="checkbox"/> 8mm	<input checked="" type="checkbox"/> 12mm		
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input type="checkbox"/> 4mm	<input checked="" type="checkbox"/> 8mm	
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2	<input type="checkbox"/> Q3	<input type="checkbox"/> Q4

**ORDERING INFORMATION**

TYPE NUMBER	PACKAGE	PACKING
SNM0629DRAQ-8/TR	PDFN3333-8L	Tape and reel

PDFN3333-8L is packed with 5000 pieces/disc in braided packaging.

**Important statement**

SIT reserves the right to change the above-mentioned information without prior notice.

Draft

**REVISION HISTORY**

Version number	Datasheet status	Revision date
V0.1	Draft version.	May 2024

Draft