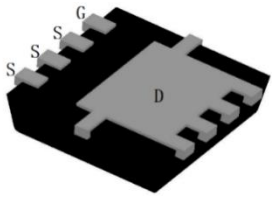
FEATURES

- Drain-Source Withstand Voltage: 60V
- Max. $R_{DS(on)}$: 25mΩ @ V_{GS}=10V
  44mΩ @ V_{GS}=4.5V
- Automotive applications
- AEC-Q101 Qualified
- Excellent ON resistance
- General footprint package PDFN3333-8L
- 100% Rg and Avalanche tested
- MSL1

PRODUCT APPEARANCE



PDFN3333-8L

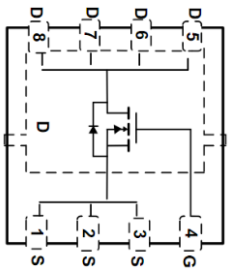
DESCRIPTION

The SNM0625DRAQ 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 SNM0625DRAQ is in compliance with RoHS.

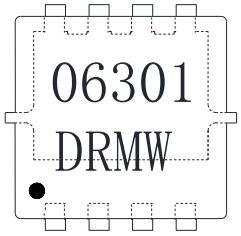
Applications:

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

PIN CONFIGURATION



MARKING



06301 = 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}		±20	V
Continuous Drain Current	I_D	T_C=25°C	25	A
		T_C=100°C	17	A
Pulsed Drain Current [3]	I_{DM}		62	A
Continuous Drain Current	I_D	T_A=25°C	7	A
		T_A=100°C	5	A
Avalanche Energy L=0.3mH	E_{AS}		14	mJ
Power Dissipation [2]	P_D	T_C=25°C	32	W
		T_C=100°C	16	W
Power Dissipation [1]	P_D	T_A=25°C	2.4	W
		T_A=100°C	1.2	W
Operating Junction Temperature	T_J		-55 to 175	°C
Storage Temperature Range	T_{STG}		-55 to 175	°C

THERMAL RESISTANCE RATINGS

Single Operation					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance (1)	Steady State	$R_{\theta JA}$	49	62	°C/W
Junction-to-Case Thermal Resistance (2)	Steady State	$R_{\theta JC}$	3.8	4.7	

ELECTRONICS CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0 V, I_D = 250μA	60			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	BV_{DSS}/T_J			22		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}= 0V, T_J=25°C			10	μA
		V_{DS}=60V, V_{GS}= 0V, T_J=125°C			250	μA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0 V, V_{GS}= 20V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D= 250μA	1.3	1.7	2.1	V
Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			-4.4		mV/°C
Drain-to-source On-resistance (4)	$R_{DS(on)}$	V_{GS} =10V, I_D =10A		19	25	mΩ
		V_{GS} =4.5V, I_D =10A		32.5	44	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0V, f = 1.0MHz, V_{DS}=25 V		400		pF
Output Capacitance	C_{OSS}			210		
Reverse Transfer Capacitance	C_{RSS}			24		
Total Gate Charge (5)	$Q_{G(TOT)}$	V_{GS}=4.5V, V_{DS}= 48V, I_D =10A		9.6		nC

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Total Gate Charge (5)	$Q_{G(TOT)}$	V_{GS}=4.5V, V_{DS}= 48V, I_D =10A		5.2		
Gate-to-Source Charge (5)	Q_{GS}			1.8		
Gate-to-Drain Charge (5)	Q_{GD}			2.5		
Gate Resistance	Rg	f=1MHz		1.0		Ω
SWITCHING CHARACTERISTICS (5)						
Turn-On Delay Time	td(ON)	V_{GS}=4.5V, V_{DS}= 48V, I_D=10A, R_G=5Ω		6.6		ns
Rise Time	tr			16		
Turn-Off Delay Time	td(OFF)			9.6		
Fall Time	tf			6.4		
Body Diode Reverse Recovery Time	trr	I_F=10A, dI/dt= 100A/μs		15		ns
Body Diode Reverse Recovery Charge	Qrr	I_F=10A, dI/dt= 100A/μs		6.3		nC
BODY DIODE CHARACTERISTICS						
Forward Voltage (4)	V_{SD}	V_{GS}=0 V, I_S=10A	0.5	0.85	1.2	V

(T_J=25°C, unless otherwise noted.)

Note:

(1) FR-4 board (38mm×38mm×t1.6mm, 70μm Copper) partially covered with copper (645mm^2 area). The power dissipation P_{DSM} is based on Junction-to-Ambient thermal resistance value and the $T_{J(MAX)}$=175°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 $T_{J(MAX)}$=175°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.

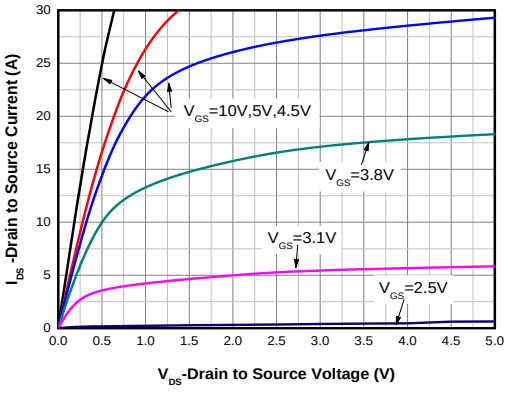
(3) Repetitive rating, pulsed, duty cycle ~1%, keep initial T_J=25°C, the maximum allowed junction temperature of 175°C.

(4) The static characteristics are obtained using ~380μs pulse.

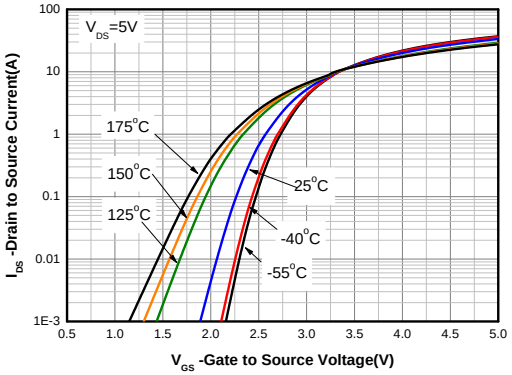
(5) The parameter is not subject to production test – verified by design / characterization.

TYPICAL CHARACTERISTICS

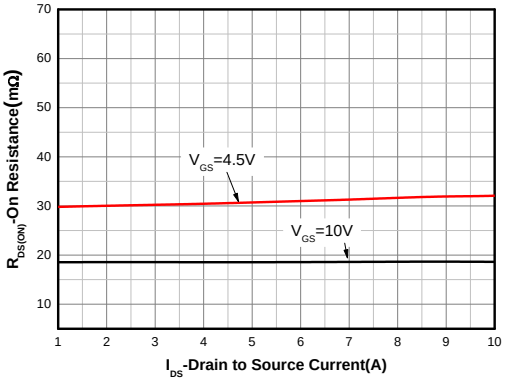
Ta=25℃, unless otherwise noted.



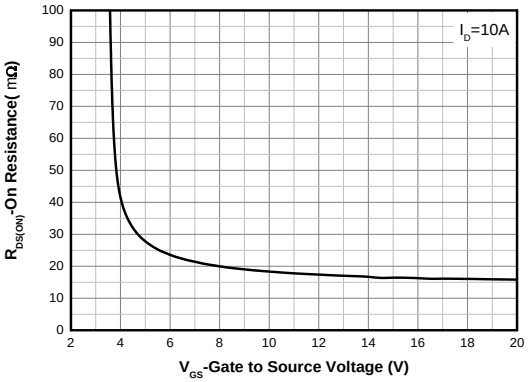
Output Characteristics [(4)]



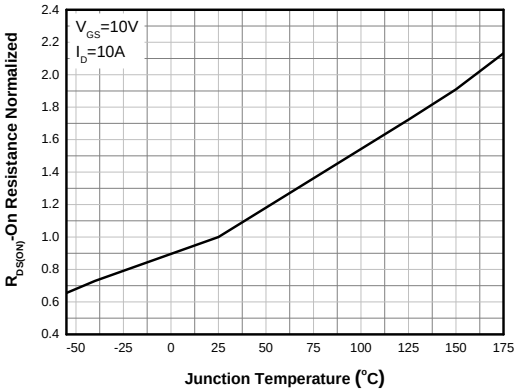
Transfer Characteristics [(4)]



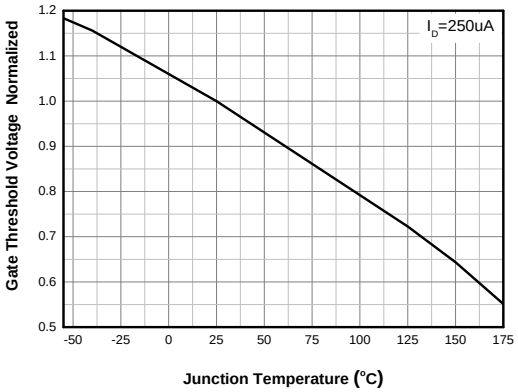
On-Resistance vs. Drain Current [(4)]



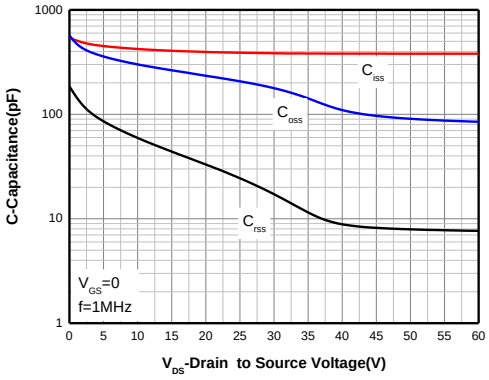
On-Resistance vs. Gate-to-Source Voltage [(4)]



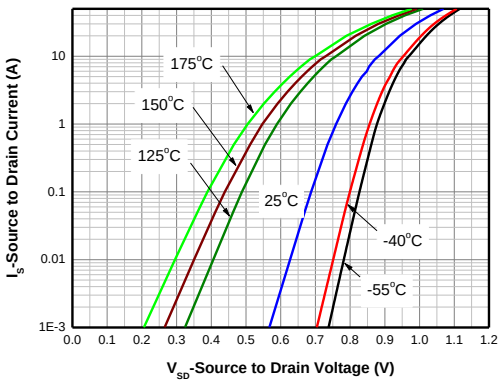
On-Resistance vs. Junction Temperature [(4)]



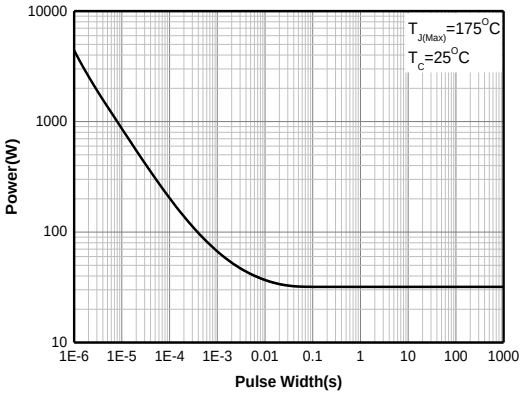
Threshold Voltage vs. Temperature



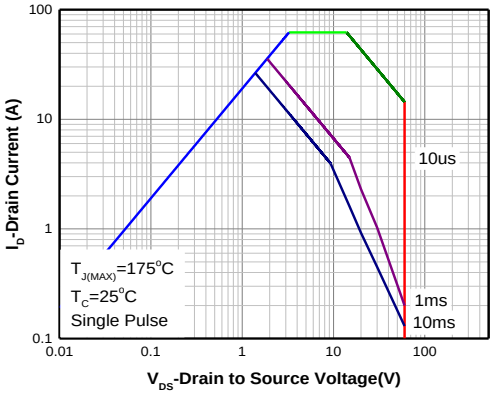
Capacitance



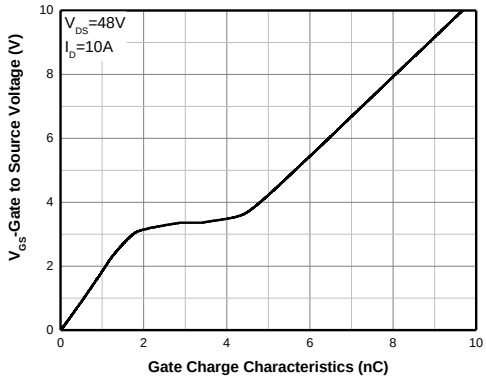
Body Diode Forward Voltage [(4)]



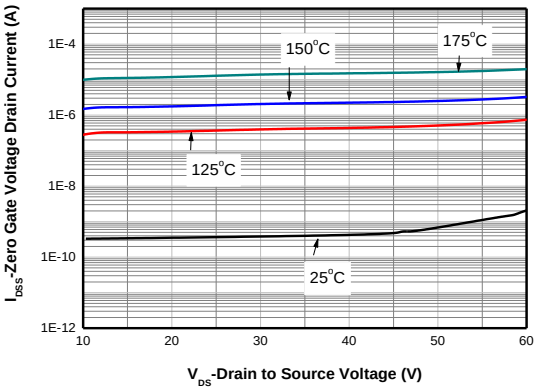
Single Pulse power



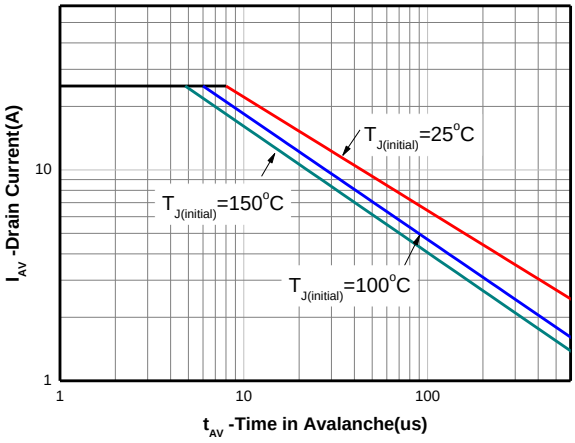
Safe Operating Area



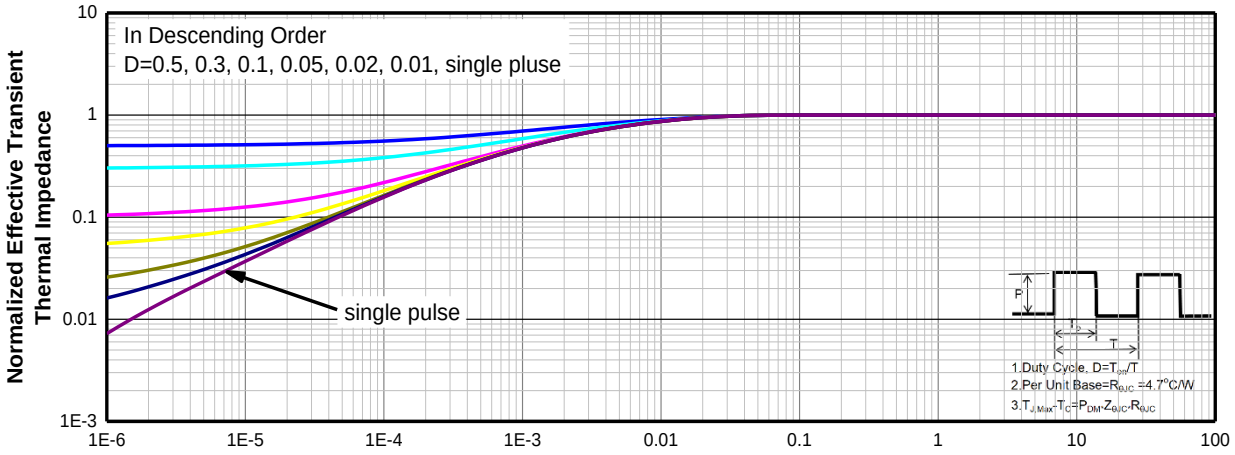
Gate Charge Characteristics



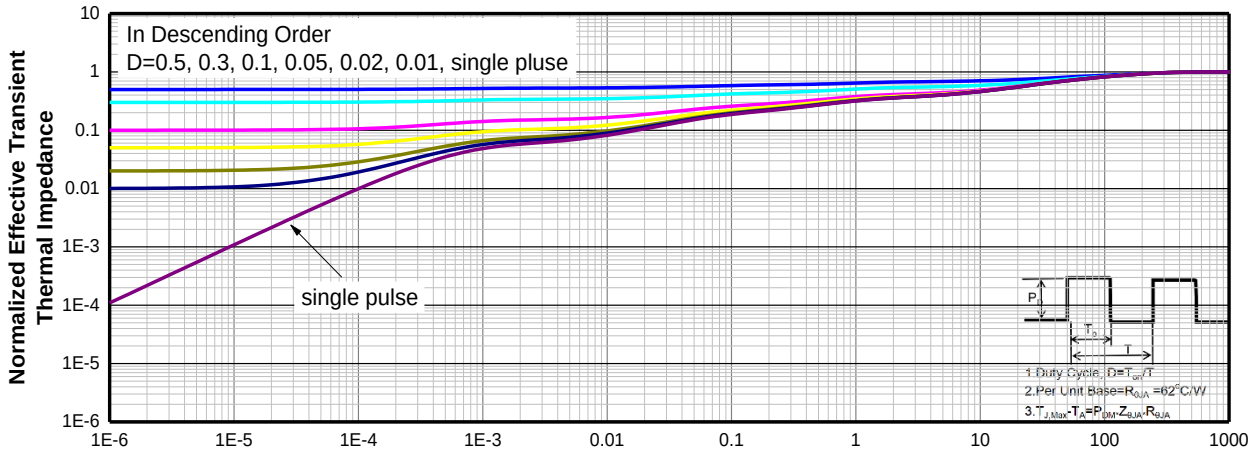
Drain Current vs. Drain Voltage



Avalanche characteristics



Transient Thermal Response (Junction-to-Case)

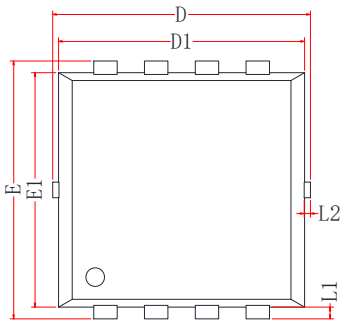


Transient Thermal Response (Junction-to-Ambient)

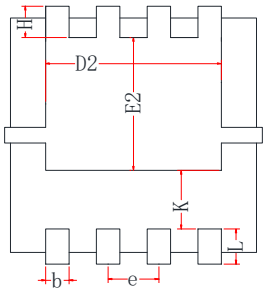
PDFN3333-8L DIMENSIONS

PACKAGE SIZE

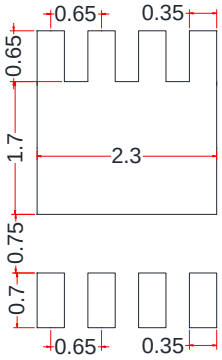
Symbol	Min.	Typ.	Max.
A	0.70	0.80	0.90
A3	0.14	0.15	0.20
b	0.25	0.30	0.39
D	3.10	3.30	3.50
D1	3.05	3.15	3.25
D2	2.15	2.25	2.35
e	0.55	0.65	0.75
E	3.10	3.30	3.50
E1	2.90	3.00	3.10
E2	1.60	1.70	1.80
H	0.25	0.40	0.55
K	0.65	0.75	0.85
L	0.30	0.45	0.60
L1	0.05	0.15	0.25
L2	-	-	0.15
θ	8 °	10 °	12 °



TOP VIEW



BOTTOM VIEW

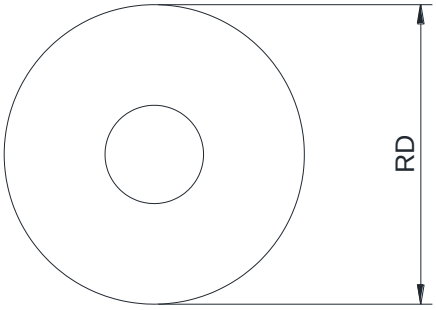


RECOMMENDED LAND PATTERN(Unit:mm)

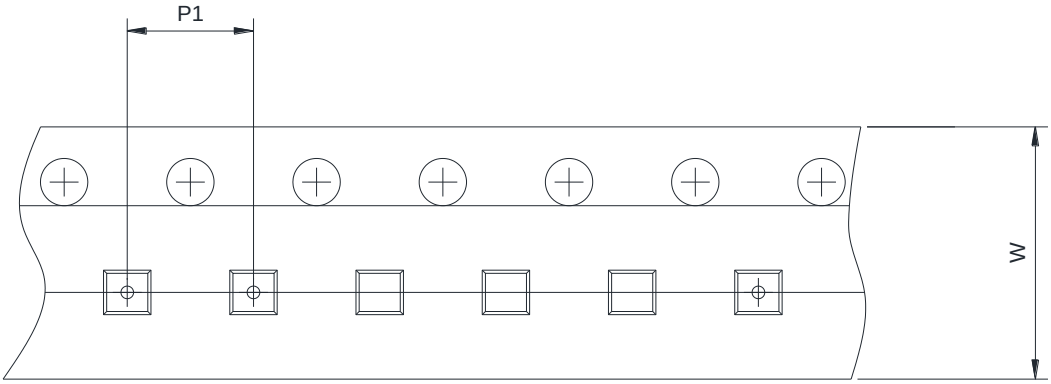
SIDE VIEW

TAPE AND REEL INFORMATION

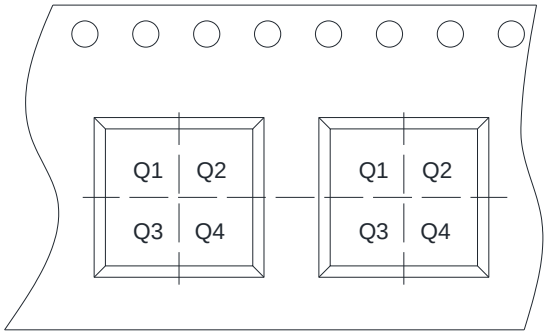
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

RD	Reel Dimension	☐ 7inch	☑ 13inch		
W	Overall width of the carrier tape	☐ 8mm	☑ 12mm	☐ 16mm	
P1	Pitch between successive cavity centers	☐ 2mm	☐ 4mm	☑ 8mm	
Pin1	Pin1 Quadrant	☑ Q1	☐ Q2	☐ Q3	☐ Q4

ORDERING INFORMATION

TYPE NUMBER	PACKAGE	PACKING
SNM0625DRAQ-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.

REVISION HISTORY

Version number	Datasheet status	Revision date
V1.0	Initial version.	April 2024