

30V N-Channel MOSFET

FEATURES

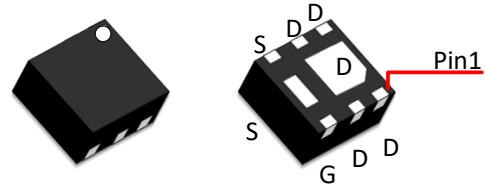
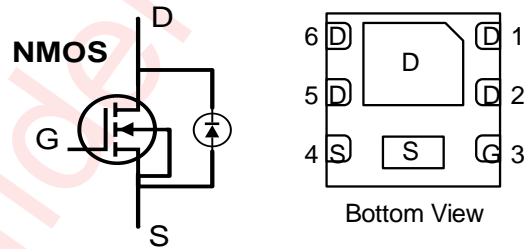
- Low on-state resistance
- HF/RoHS compliant
- 100% UIS tested
- 100% R_g tested
- DFN 2mmX2mmX0.75mm-6L Package

APPLICATIONS

- Motor controllers
- DC-to-DC convertors
- Battery-driven electronic products, electrical equipment and machines

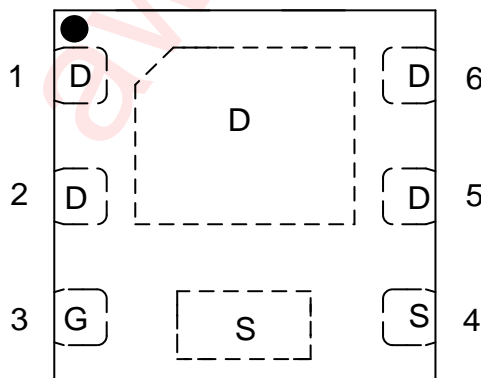
GENERAL DESCRIPTION

Product Summary	
V _{DS}	30V
R _{DS(ON)}	4.7 mΩ (Typ.)@V _{GS} = 10V
	6.3 mΩ (Typ.)@V _{GS} = 4.5V
I _D	15.4A

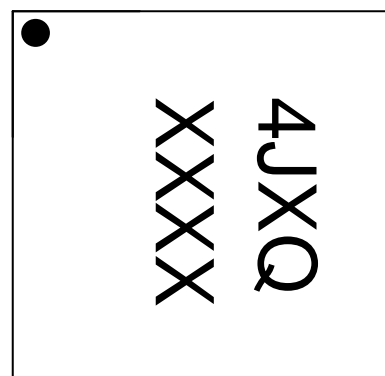


PIN CONFIGURATION AND TOP MARK

AW403002NDNR
(Top View)



AW403002NDNR Marking
(Top View)



4JXQ-AW403002NDNR
XXXX-Production Tracing Code

ORDERING INFORMATION

Part Number	Package	Marking	Moisture Sensitivity Level	Environmental Information	Delivery Form
AW403002NDNR	DFN 2mmX2mmX0.75mm-6L	4JXQ	MSL1	RoHS+HF	3000 units/ Tape and Reel

ABSOLUTE MAXIMUM RATINGS^(NOTE1)

T_A= 25°C unless otherwise noted.

Symbol	Parameter	Maximum	Unit	
V _{DS}	Drain-Source Voltage	30	V	
V _{GS}	Gate-Source Voltage	±20	V	
I _D	Drain Current (DC) ^(NOTE 2, 6)	T _A =25°C	15.4	A
		T _A =75°C	13.2	A
I _{DM}	Drain Current (Pulse) ^(NOTE 3)	150	A	
P _D	Power Dissipation (T _A =25°C) ^(NOTE2)	2.23	W	
T _J	Maximum Operating Junction Temperature	150	°C	
T _{STG}	Storage Temperature	-55 to 150	°C	
I _{AS}	Avalanche Current ^(NOTE 5)	21	A	
E _{AS}	Avalanche Energy ^(NOTE 5)	22	mJ	

Thermal Information

Symbol	Parameter	Condition	Value	Unit
R _{θJA}	Maximum Junction to Ambient ^(NOTE 2, 4)	Steady-State	56	°C/W

NOTE1: Conditions out of those ranges listed in "absolute maximum ratings" may cause permanent damages to the device. In spite of the limits above, functional operation conditions of the device should within the ranges listed in "recommended operating conditions". Exposure to absolute-maximum-rated conditions for prolonged periods may affect device reliability.

NOTE2: Mounted on FR-4 material with 1inch², 2oz. Copper.

NOTE3: Test condition 380μs 25°C.

NOTE4: Thermal resistance from junction to ambient is highly dependent on PCB layout.

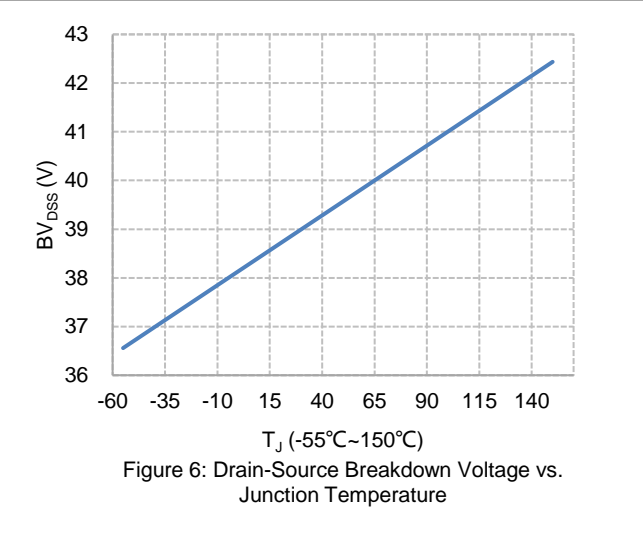
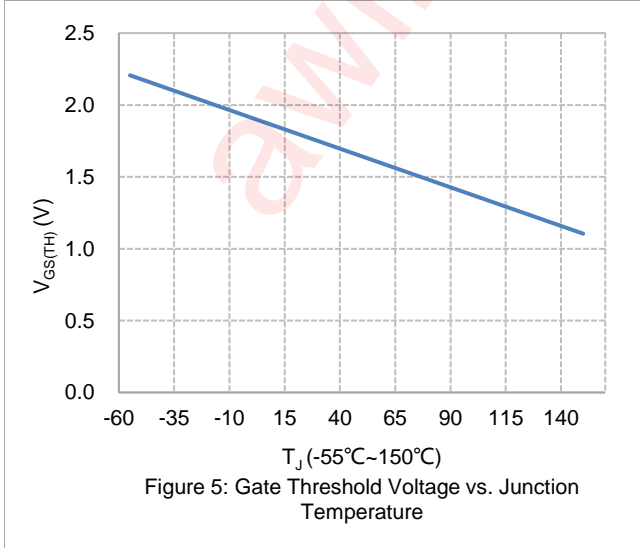
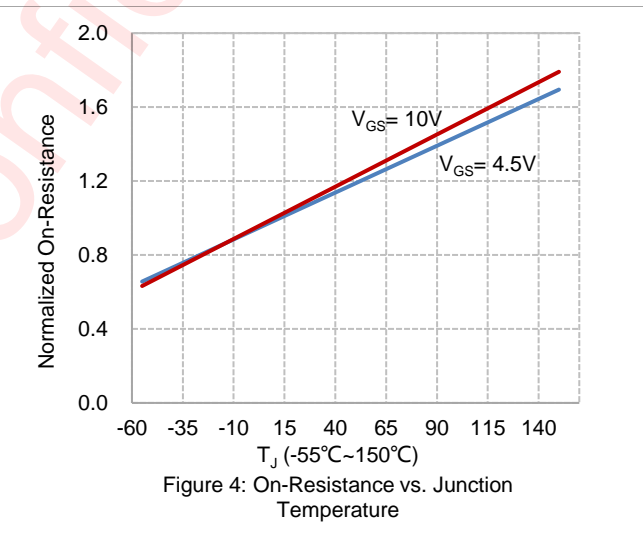
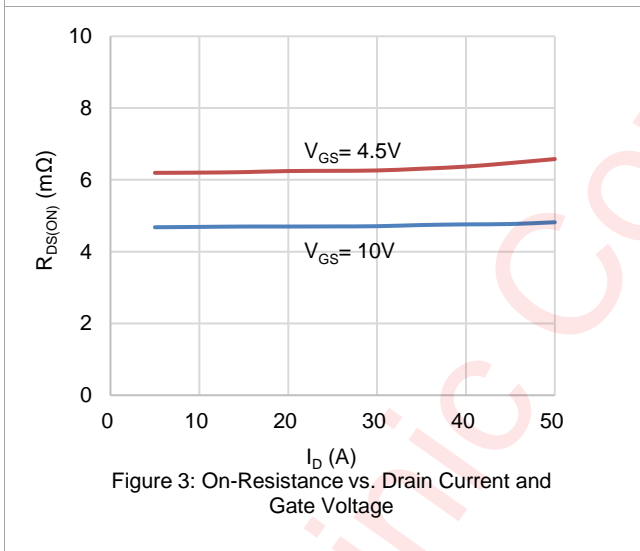
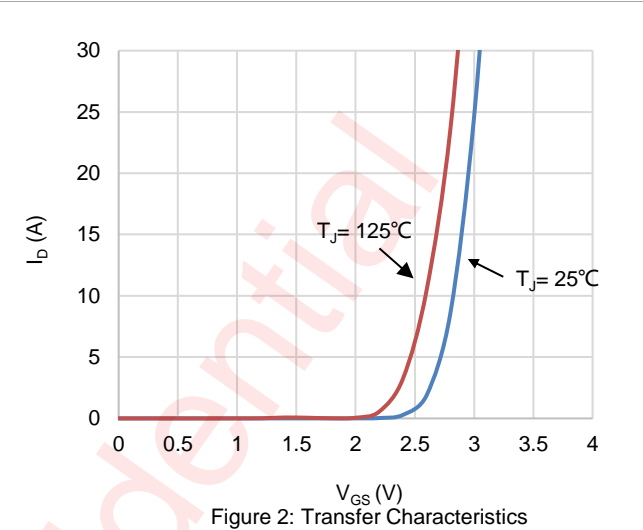
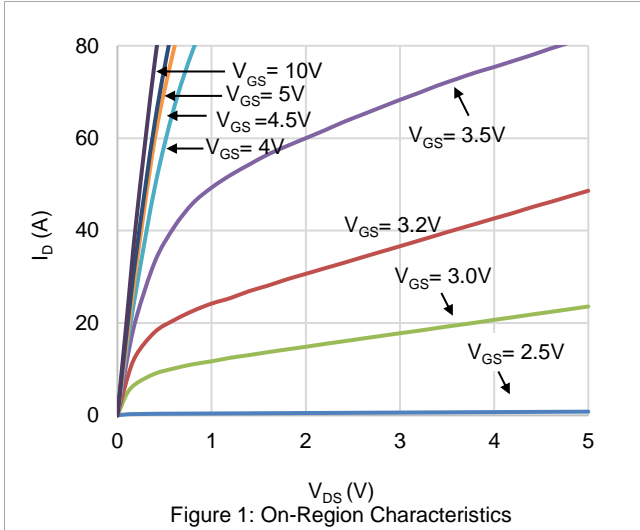
NOTE5: L= 0.1mH, V_{GS}= 10V, R_g= 25Ω, V_{DS}= 15V.

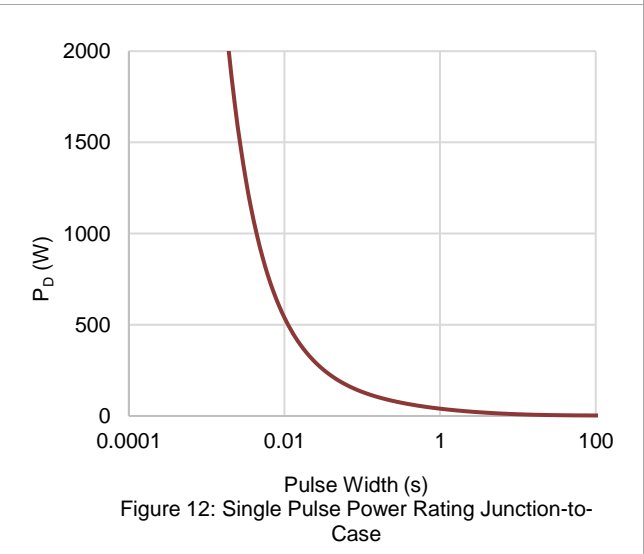
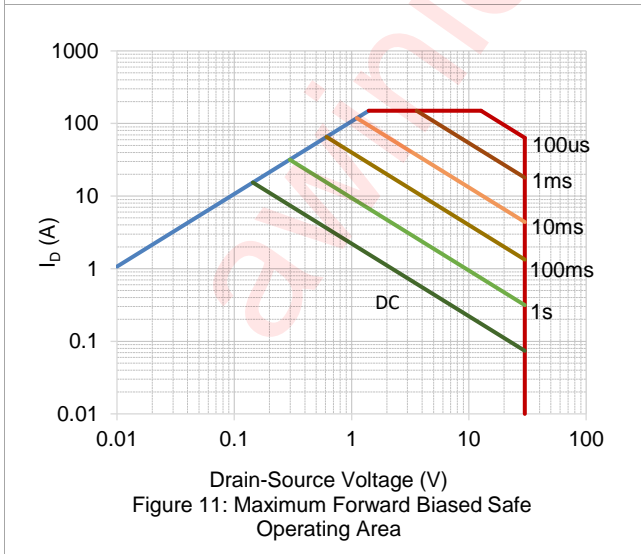
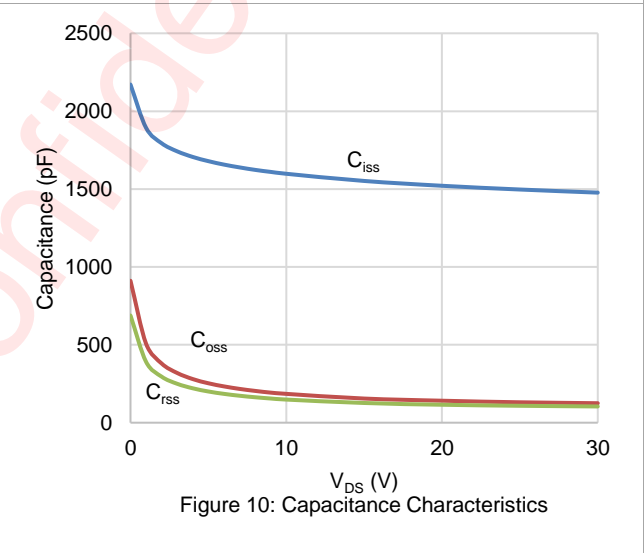
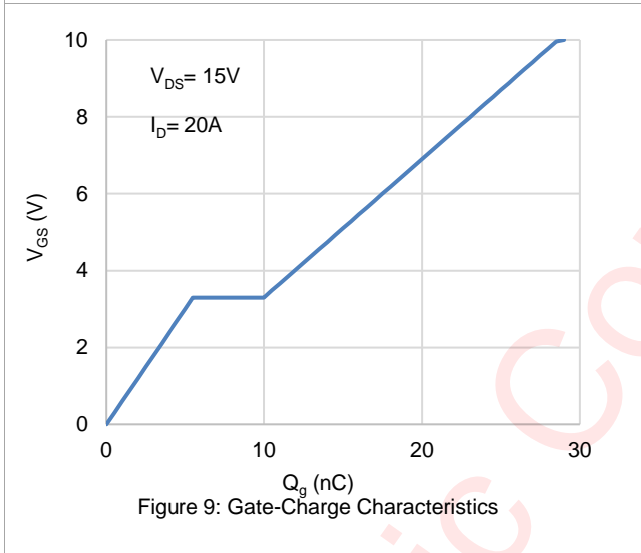
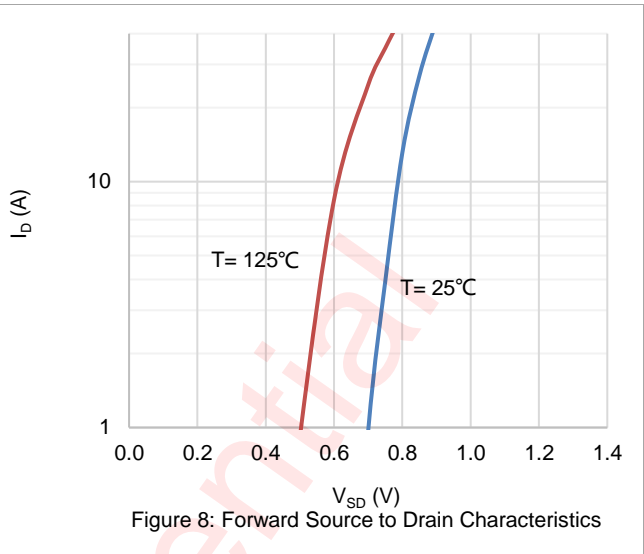
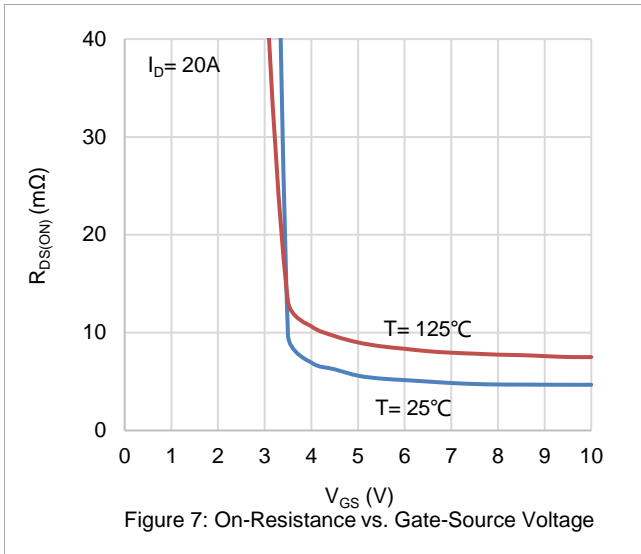
NOTE6: Rated according to R_{θJA}.

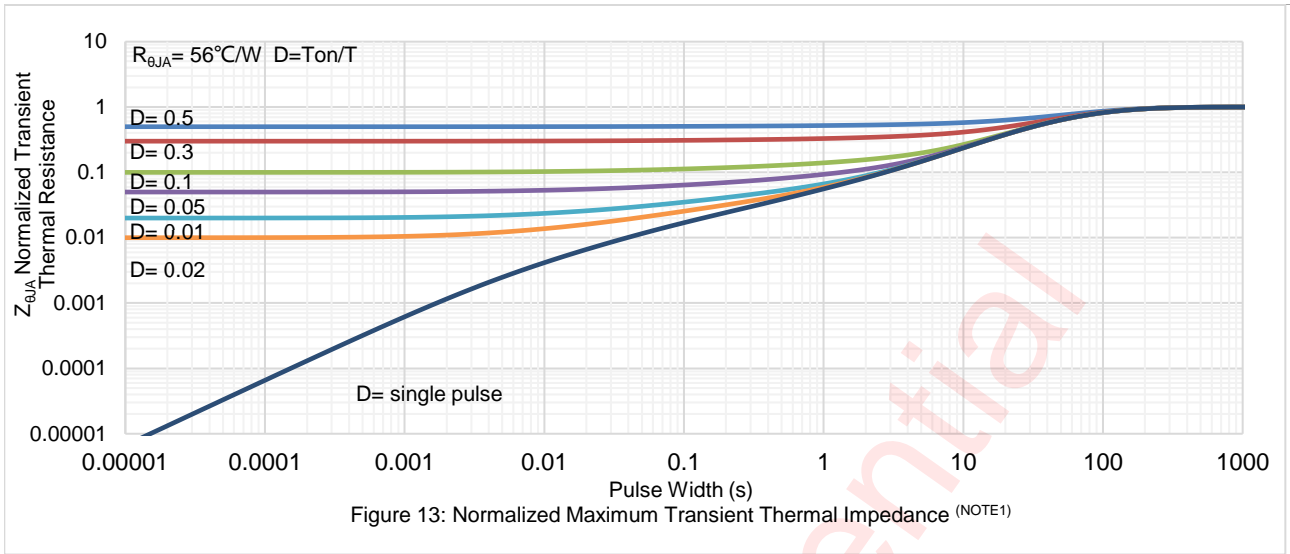
ELECTRICAL CHARACTERISTICST_J= 25°C for typical values (unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V			1	μA
I _{GSS}	Gate Leakage Current	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.1	1.8	2.3	V
R _{DS(ON)}	Static Source to Source On-Resistance	V _{GS} = 10V, I _D = 10A		4.7	6	mΩ
		V _{GS} = 4.5V, I _D = 10A		6.3	7.5	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 5V, I _D = 20A		60		S
V _{SD}	Diode Forward Voltage	I _S = 1A, V _{GS} = 0V		0.7	1	V
DYNAMIC PARAMETERS						
R _g	Gate Resistance	f= 1MHz		2.3		Ω
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f= 1MHz		1550		pF
C _{oss}	Output Capacitance			160		pF
C _{rss}	Reverse Transfer Capacitance			125		pF
SWITCHING PARAMETERS						
Q _g	Total Gate Charge (V _{GS} = 10V)	V _{GS} = 10V, V _{DS} = 15V, I _D = 20A		28.5		nC
Q _g	Total Gate Charge (V _{GS} = 4.5V)			13.8		nC
Q _{gs}	Gate Source Charge			5.4		nC
Q _{gd}	Gate Drain Charge			4.8		nC
t _{d(on)}	Turn-On Delay Time	V _{DS} = 15V, I _D = 20A, R _G = 3Ω, V _{GS} = 10V		10		ns
t _r	Turn-On Rise Time			7		ns
t _{d(off)}	Turn-Off Delay Time			36		ns
t _f	Turn-Off Fall Time			12		ns
t _{rr}	Body Diode Reverse Recovery Time	I _D = 10A, di/dt= 100A/μs		24		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _D = 10A, di/dt= 100A/μs		30		nC

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

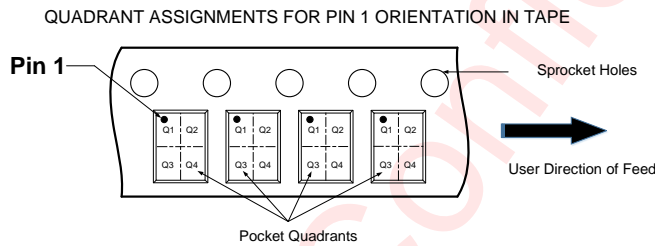
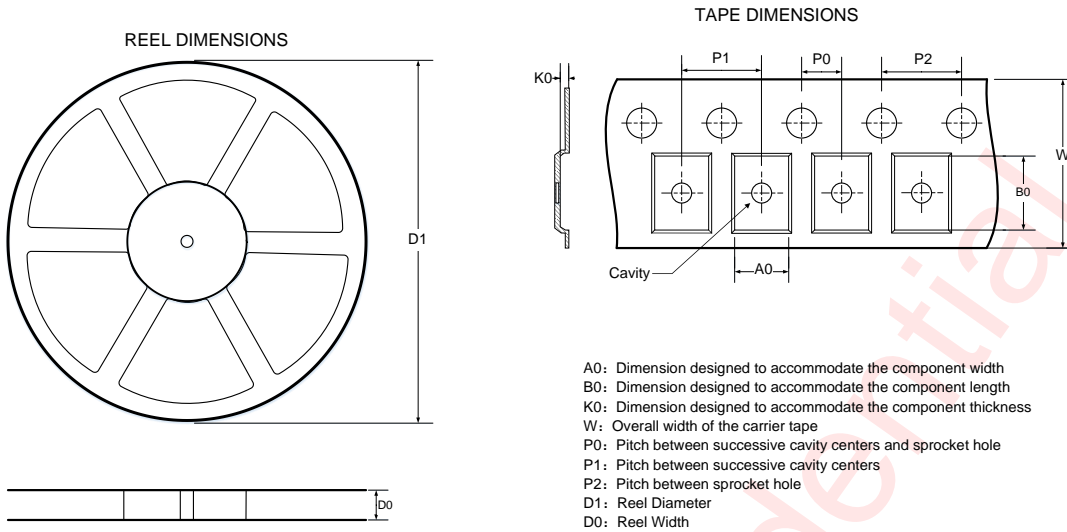






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TAPE AND REEL INFORMATION



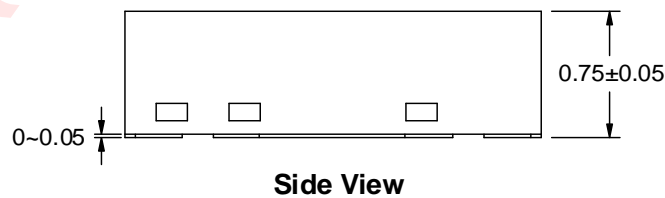
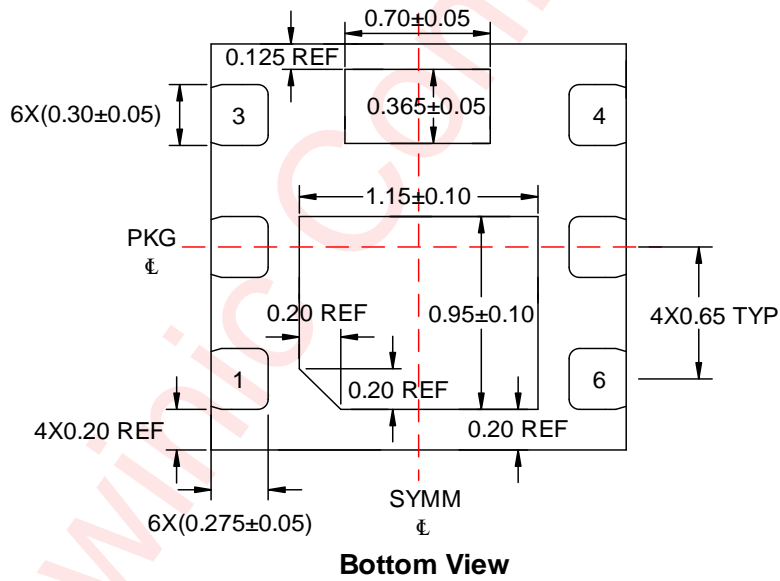
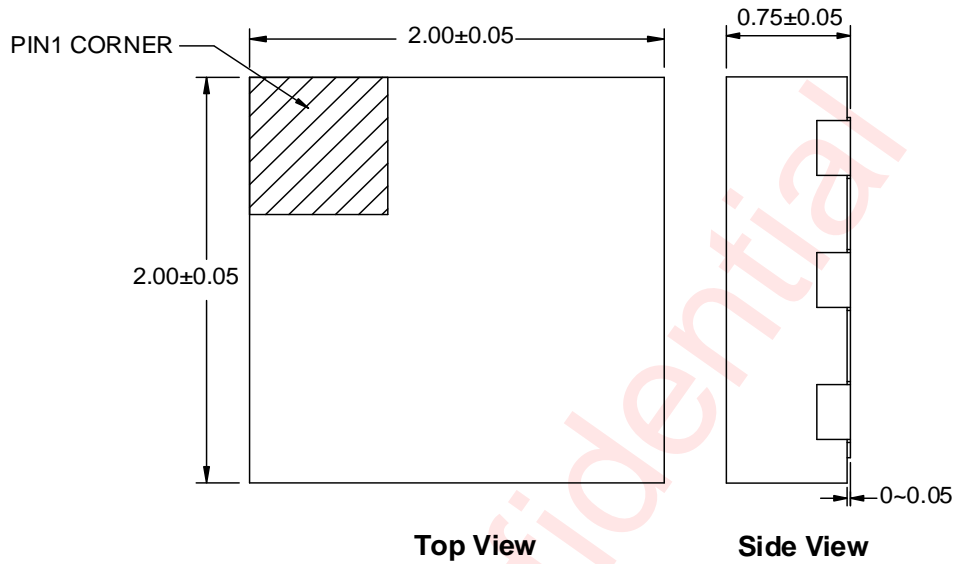
Note: The above picture is for reference only. Please refer to the value in the table below for the actual size

DIMENSIONS AND PIN1 ORIENTATION

D1 (mm)	D0 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
178	8.4	2.3	2.3	1	2	4	4	8	Q1

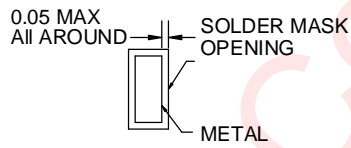
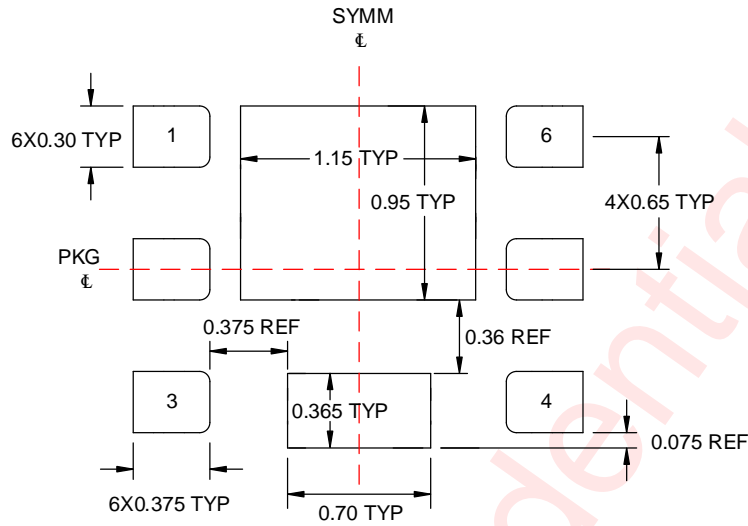
All dimensions are nominal

PACKAGE DESCRIPTION

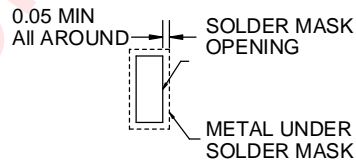


Unit:mm

LAND PATTERN DATA



NON SOLDER MASK DEFINED



SOLDER MASK DEFINED

Unit : mm

REVISION HISTORY

Version	Date	Change Record
V1.0	Jun. 2021	Initial release
V1.1	Sep. 2021	Updated $R_{DS(ON)}$ $V_{GS}=10V$ spec limit
V1.2	Jul. 2022	Add Figure 6: BV_{DSS} vs T_J , Figure 5: $V_{GS(TH)}$ vs T_J ; Update Figure 4: $R_{DS(ON)}$ vs T_J temperature range
V1.3	Jun. 2023	Updated the dimensional tolerances from 0.1mm to 0.05mm in Package Description (Page 8)

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