

30V N-Channel MOSFET

Features

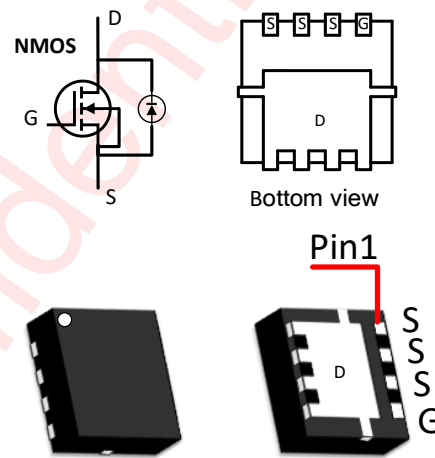
- Low on-resistance
- RoHS compliant
- 100% UIS tested
- 100% R_g tested
- DFN 3.3mmX3.3mmX0.8mm-8L Package

Applications

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

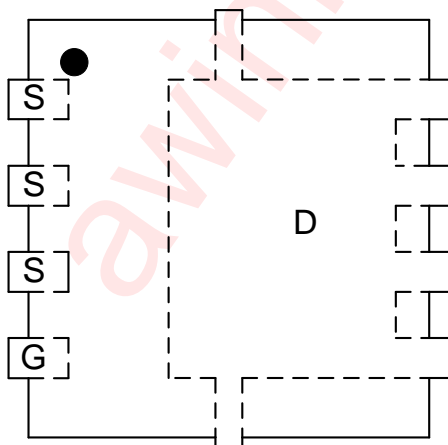
General Description

Product Summary	
V _{DS}	30V
R _{DS(ON)}	1.7mΩ (Typ.)@10V
	2.5mΩ (Typ.)@4.5V
I _D	92A

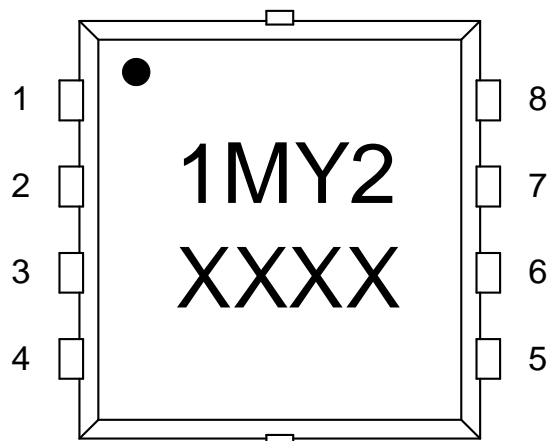


Pin Configuration and Top Mark

AW403008NDNR
(Top View)



AW403008NDNR Marking
(Top View)



1MY2-AW403008NDNR
XXXX-Production Tracing Code

Ordering Information

Part Number	Package	Marking	Moisture Sensitivity Level	Environmental Information	Delivery Form
AW403008NDNR	DFN 3.3mmX3.3mm-8L	1MY2	MSL1	RoHS+HF	6000 units/ Tape and Reel

Absolute Maximum Ratings (NOTE 1)

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 6)	T _C = 25°C	92	A
		T _C = 100°C	58	A
	Drain Current (DC) (NOTE 7)	T _A = 25°C	24	A
		T _A = 70°C	19	A
I _{DM}	Drain Current (Pulse) (T _C = 25°C) (NOTE 3)	368	A	
P _D	Power Dissipation (NOTE 6)	T _C = 25°C	31	W
		T _C = 100°C	12	W
	Power Dissipation (NOTE 7)	T _A = 25°C	2.2	W
		T _A = 70°C	1.4	W
T _J	Maximum Operating Junction Temperature	150	°C	
T _{STG}	Storage Temperature	-55 to 150	°C	
I _{AS}	Avalanche Current (NOTE 5)	30	A	
E _{AS}	Avalanche Energy (NOTE 5)	130	mJ	

Thermal Information

Symbol	Parameter	Condition	Value	Unit
R _{θJA}	Maximum Junction to Ambient (NOTE 2, 4)	Steady-State	55.9	°C/W
R _{θJC}	Maximum Junction-to-Case	Steady-State	3.9	°C/W

NOTE 1: 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.

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

NOTE 3: Test condition 380μs 25°C.

NOTE 4: Thermal resistance from junction to ambient is highly dependent on PCB layout.

NOTE 5: L= 0.3mH, V_{GS}= 10V, R_g= 25Ω, V_{DS}= 20V.

NOTE 6: Rated according to R_{θJC}.

NOTE 7: Rated according to R_{θJA}.

Electrical Characteristics

$T_J = 25^\circ\text{C}$ for typical values (unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{V}$, $V_{GS} = 0\text{V}$	-	-	1	μA
I_{GSS}	Gate Leakage Current	$V_{DS} = 0\text{V}$, $V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	1.2	-	2.3	V
$R_{DS(ON)}$	Static Drain to Source On-Resistance	$V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	-	1.7	2.2	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}$, $I_D = 20\text{A}$	-	2.5	3.1	$\text{m}\Omega$
g_{FS}	Forward Transconductance	$V_{DS} = 5\text{V}$, $I_D = 20\text{A}$	-	210	-	S
V_{SD}	Diode Forward Voltage	$I_S = 1\text{A}$, $V_{GS} = 0\text{V}$	0.4	-	1	V
DYNAMIC PARAMETERS						
R_g	Gate Resistance	$f = 1\text{MHz}$	-	2.7	-	Ω
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$, $V_{DS} = 15\text{V}$, $f = 1\text{MHz}$	-	4600	-	pF
C_{oss}	Output Capacitance		-	420	-	pF
C_{rss}	Reverse Transfer Capacitance		-	340	-	pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS} = 10\text{V}$, $V_{DS} = 15\text{V}$, $I_D = 20\text{A}$	-	82	-	nC
Q_{gs}	Gate Source Charge		-	13.1	-	nC
Q_{gd}	Gate Drain Charge		-	12.3	-	nC
$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 15\text{V}$, $I_D = 20\text{A}$, $R_g = 3\Omega$, $V_{GS} = 10\text{V}$	-	8.7	-	ns
t_r	Turn-On Rise Time		-	7.5	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	52	-	ns
t_f	Turn-Off Fall Time		-	15	-	ns
t_{rr}	Body Diode Reverse Recovery Time	$I_D = 10\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$	-	25	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_D = 10\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$	-	18	-	nC

Typical Electrical and Thermal Characteristics

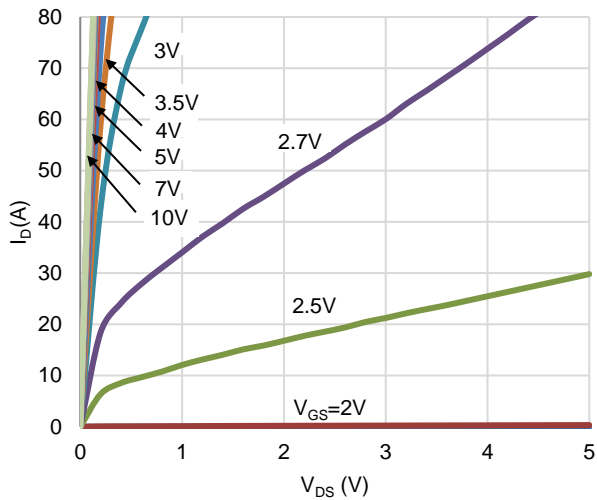


Figure 1: On-Region Characteristic

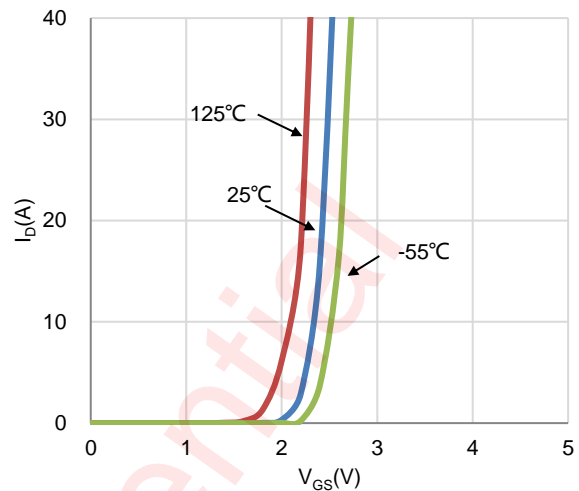


Figure 2: Transfer Characteristics

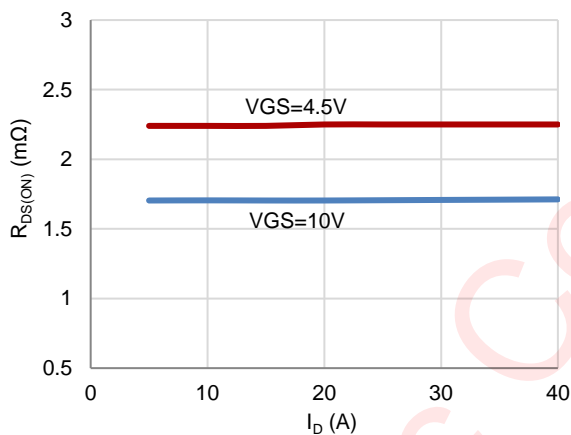


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

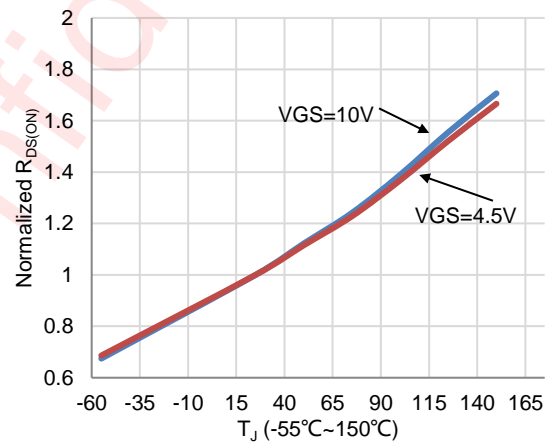


Figure 4: Normalized On-Resistance vs Junction Temperature

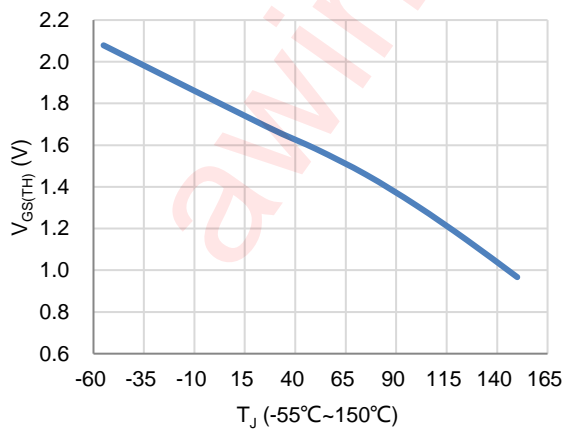


Figure 5: Gate Threshold Voltage vs Junction Temperature

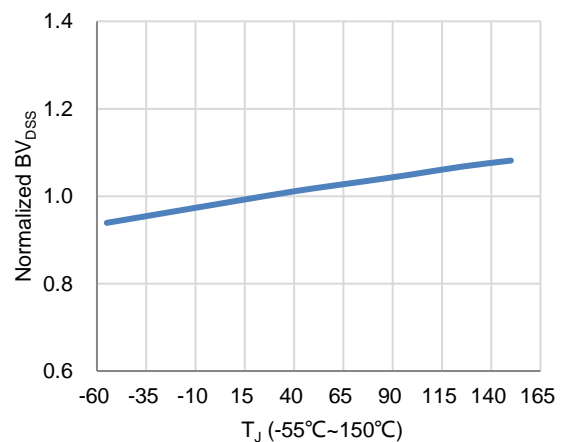


Figure 6: Drain-Source Breakdown Voltage vs Junction Temperature

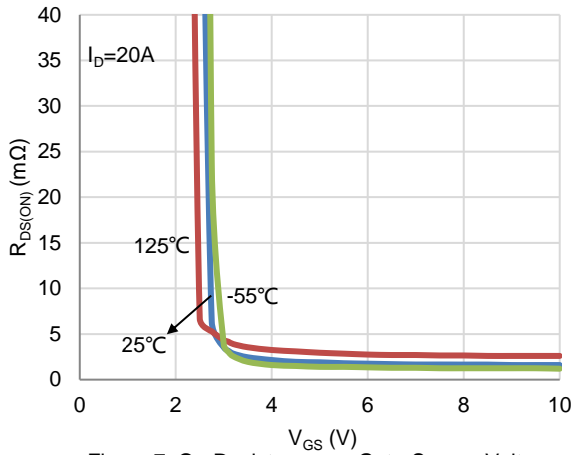


Figure 7: On-Resistance vs. Gate-Source Voltage

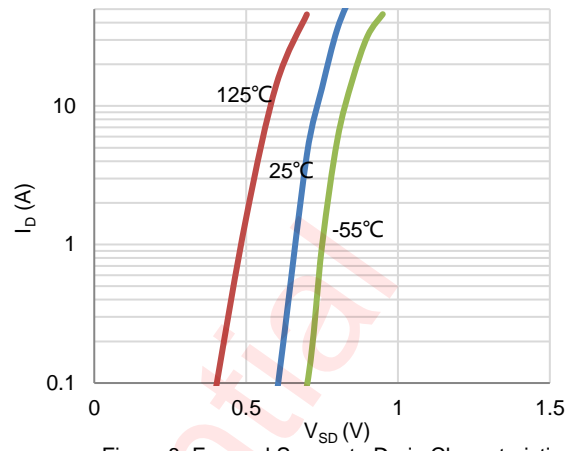


Figure 8: Forward Source to Drain Characteristics

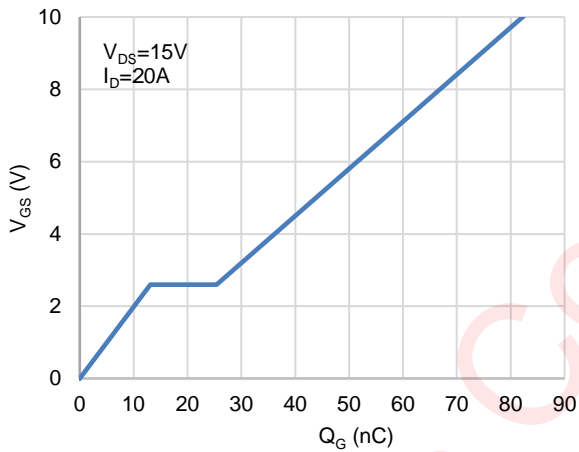


Figure 9: Gate-Charge Characteris

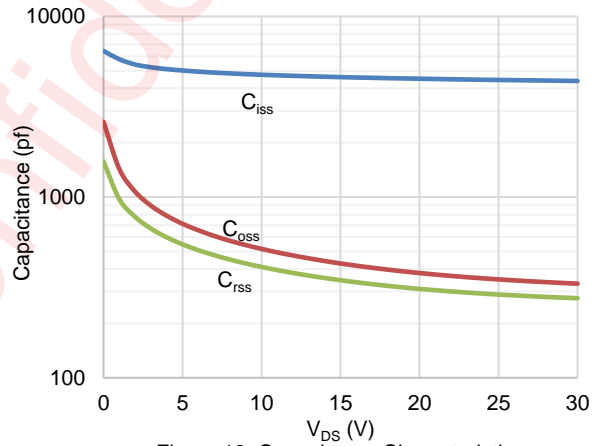


Figure 10: Capacitance Characteristics

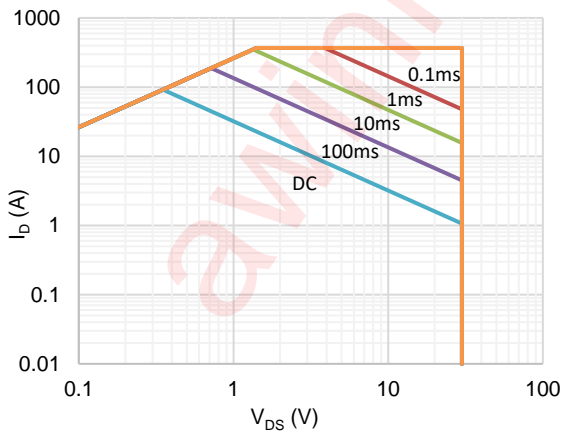


Figure 11: Maximum Forward Biased Safe Operating Area

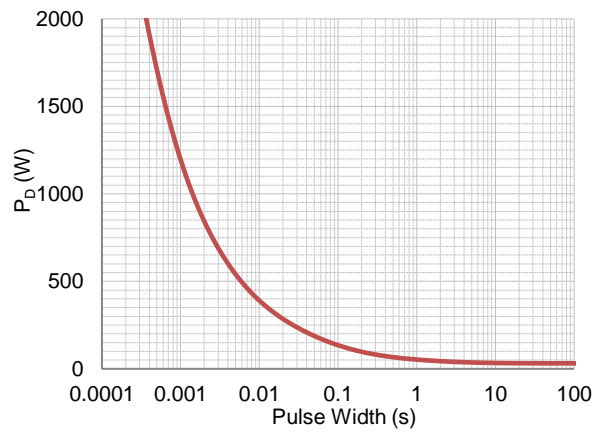
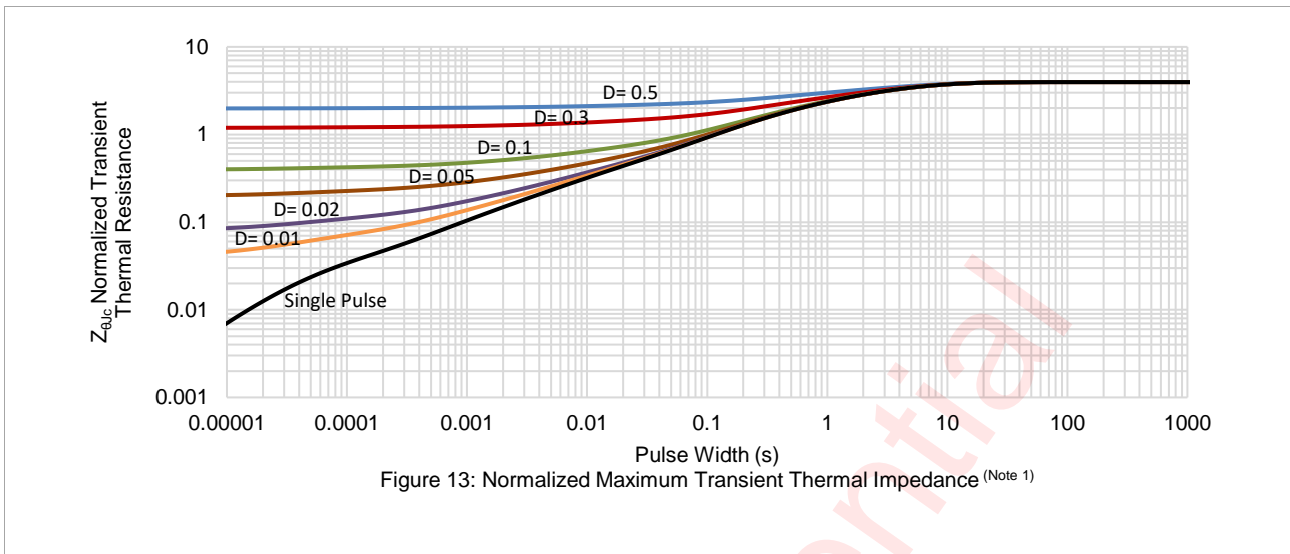
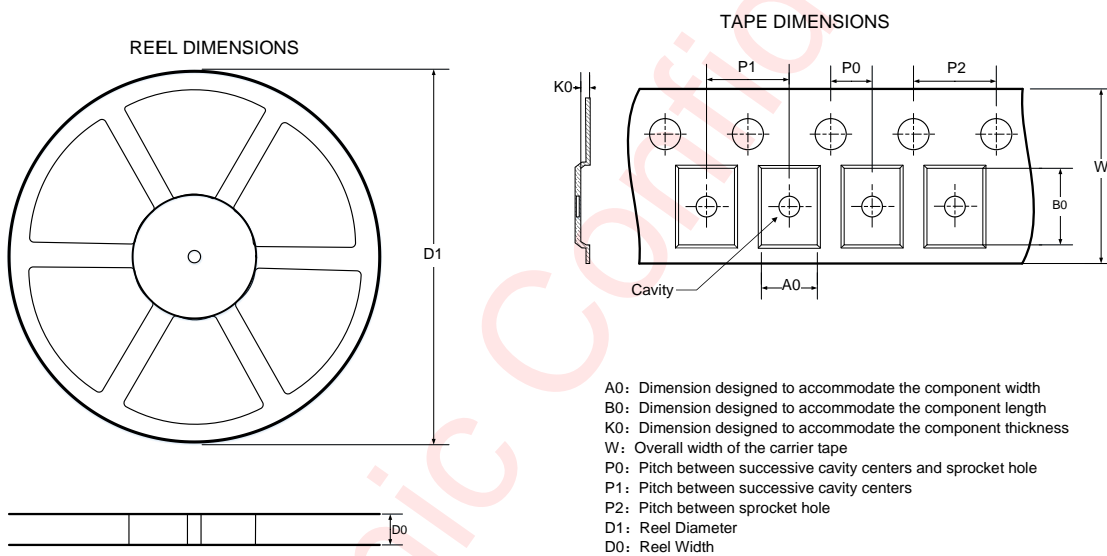


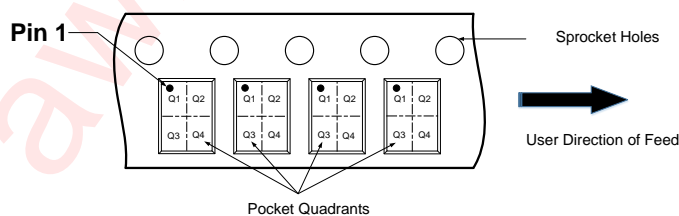
Figure 12: Single Pulse Power Rating Junction-to-Case



Tape And Reel Information



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



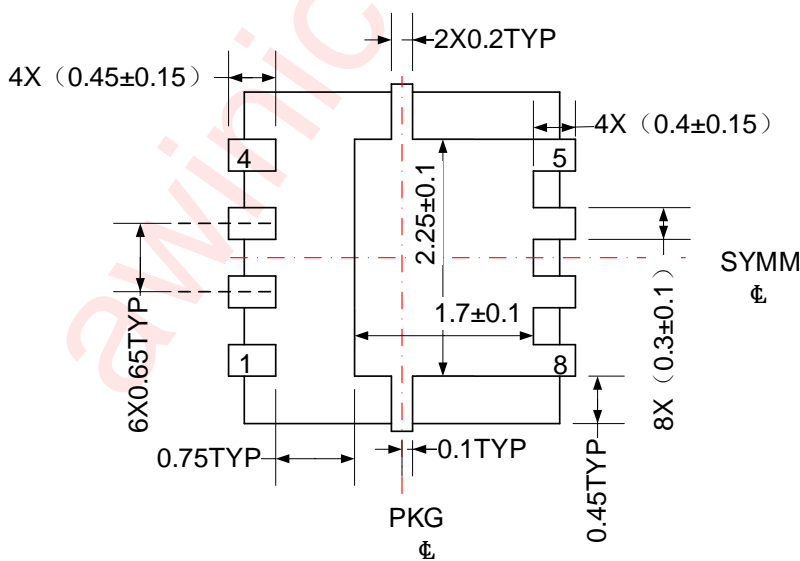
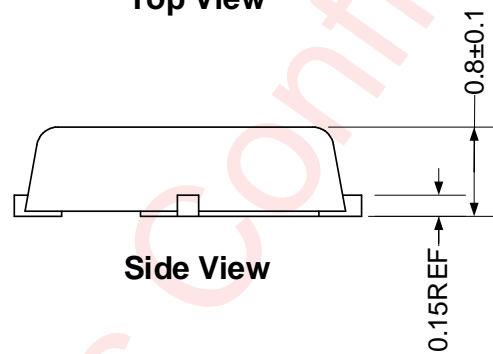
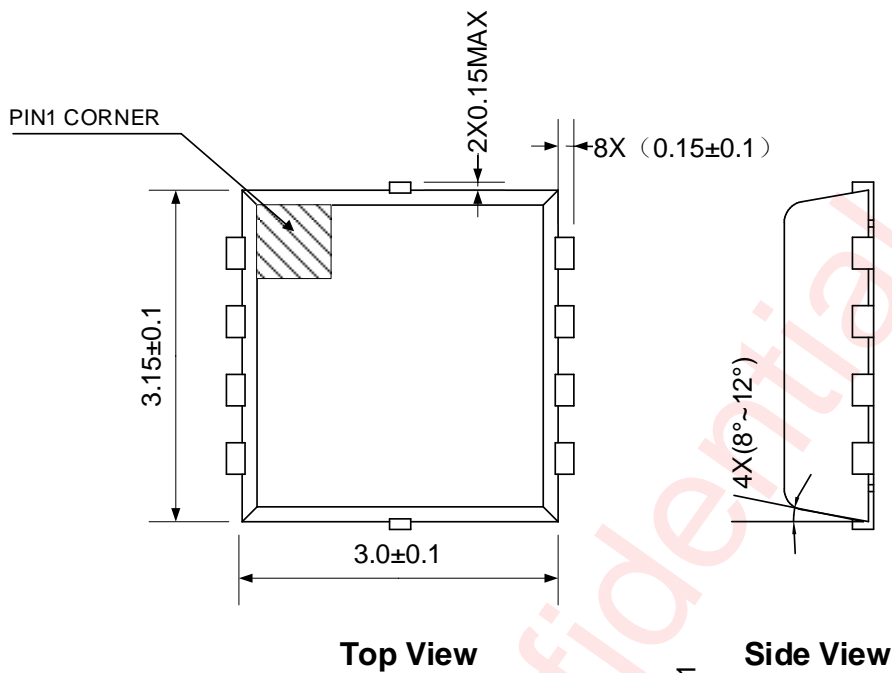
Note: The above picture is for reference only. Please refer to the value in the table below for the actual size

DIMENSIONS AND PIN1 ORIENTATION

D1 (mm)	D0 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
330	12.4	3.6	3.6	1.1	2	8	4	12	Q1

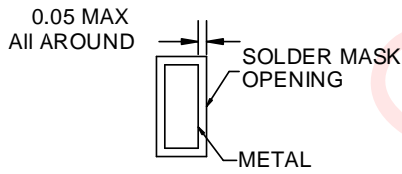
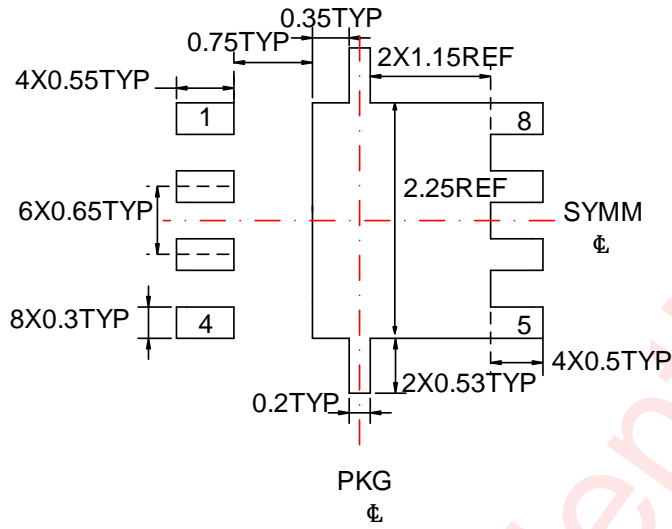
All dimensions are nominal

Package Description

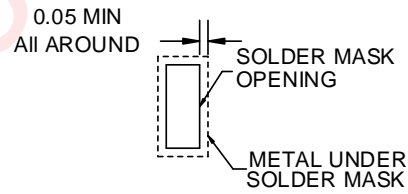


Unit:mm

Land Pattern Data



NON SOLDER MASK DEFINED



SOLDER MASK DEFINED

Unit: mm

Revision History

Version	Date	Change Record
V0.9	Feb. 2022	Draft released;
V1.0	Aug. 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;
V1.1	Nov. 2022	Update Page2 Absolute Maximum Ratings: Add "I _D " and "P _D " Rated by $R_{\theta JA}$;

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