

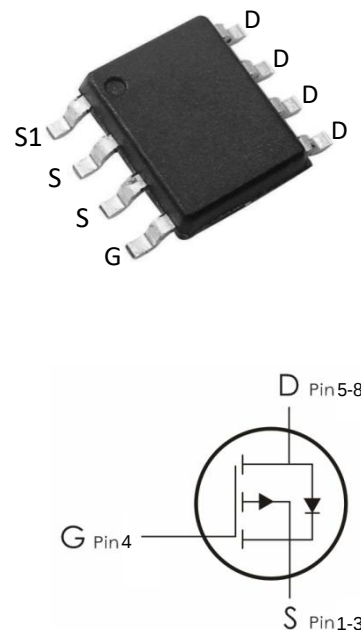
Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-60V, I_D=-9A, R_{DS(on)}<35m\Omega @V_{GS}=-10V$ (Typ: $28m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.
- 6) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DO4421	4421	SOP-8	3000 pcs/Reel

Absolute Maximum Ratings: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	-9	A
	Continuous Drain Current- $T_A=100^\circ\text{C}$ ¹	-6.3	
I_{DM}	Pulsed Drain Current ²	-36	
P_D	Power Dissipation	2.1	W
E_{AS}	Single pulse avalanche energy ³	135	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	60	$^\circ\text{C}/\text{W}$

Electrical Characteristics: ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-60V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1	-1.69	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ⁴	V _{GS} =-10V, I _D =-15A	---	28	35	m Ω
		V _{GS} =-4.5V, I _D =-10A	---	30	40	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	2535	---	pF
C _{oss}	Output Capacitance		---	133	--	
C _{rss}	Reverse Transfer Capacitance		---	97	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-30V, R _G =3 Ω , I _D =-20A, V _{GS} =-10V	---	12	---	ns
t _r	Rise Time		---	9	---	ns
t _{d(off)}	Turn-Off Delay Time		---	63	---	ns
t _f	Fall Time		---	13	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-20A	---	46	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	12	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =-15A	---	---	-1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	-9	A
I _{SM}	Pulsed Drain Current		---	---	-36	A
T _{rr}	Reverse Recovery Time	I _F =20A, T _J =25 °C	---	26	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	---	29	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : $T_J=25^{\circ}C$, $V_{DD}=-30V$, $V_G=-10V$, $L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

Typical Characteristics: ($T_A=25^{\circ}C$ unless otherwise noted)

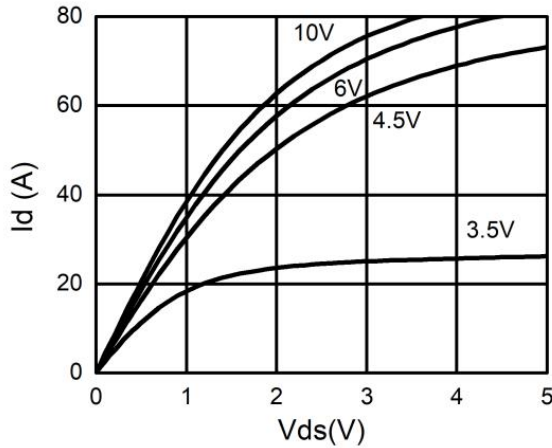


Figure 1. Output Characteristics

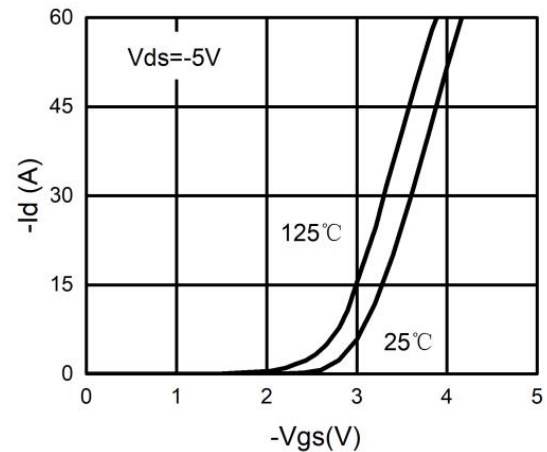


Figure 2. Transfer Characteristics

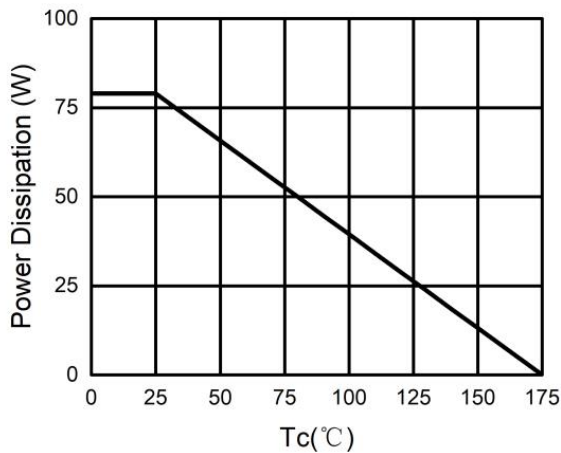


Figure 3. Power Dissipation

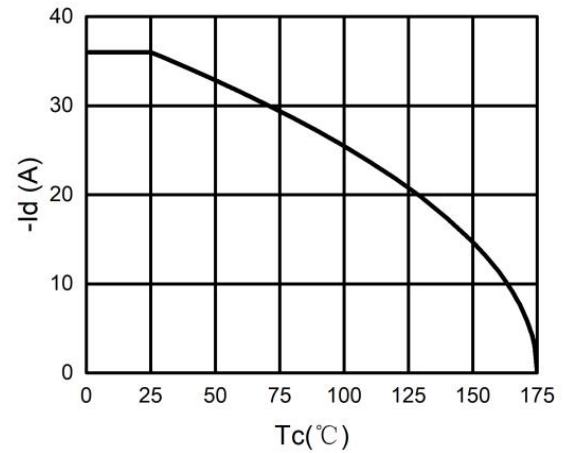


Figure 4. Drain Current

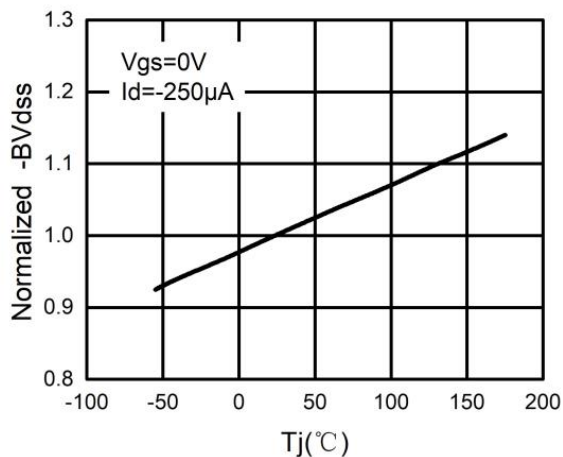


Figure 5. BV_{DSS} vs Junction Temperature

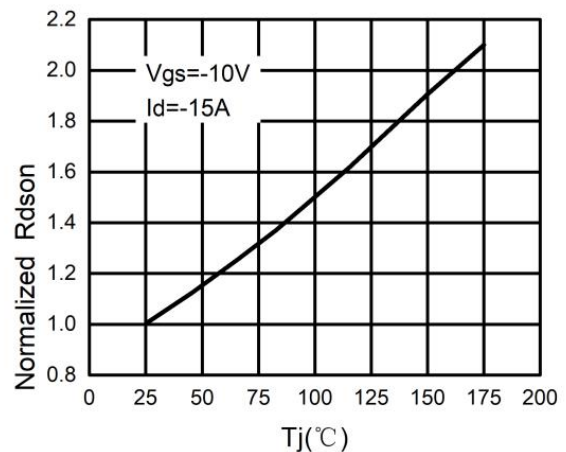


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

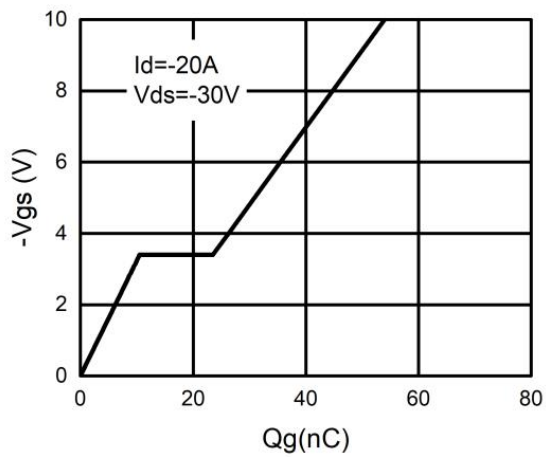


Figure 7. Gate Charge Waveforms

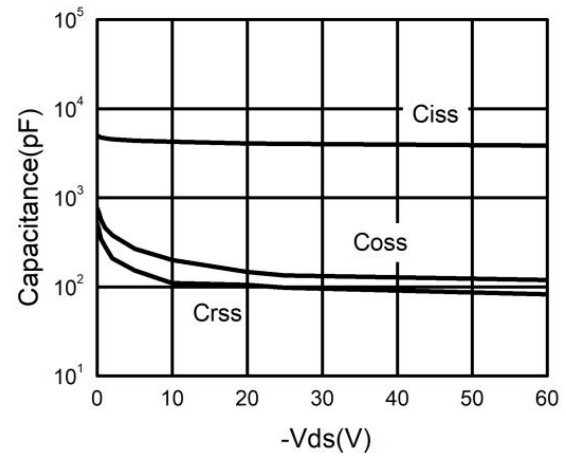


Figure 8. Capacitance

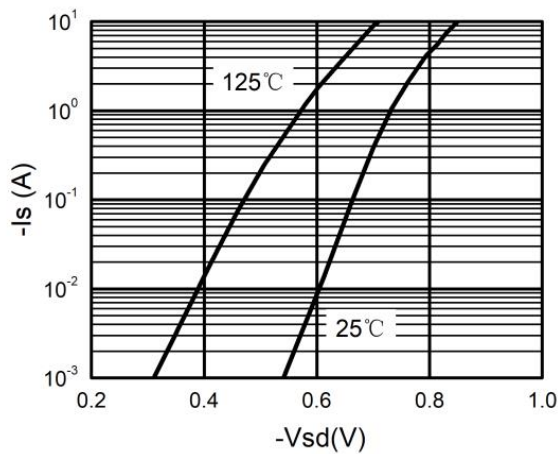


Figure 9. Body-Diode Characteristics

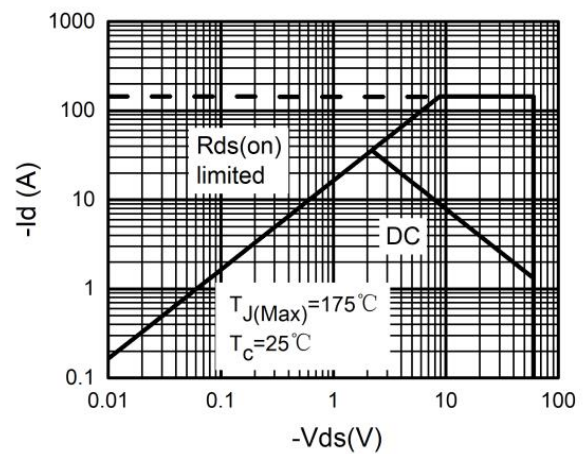
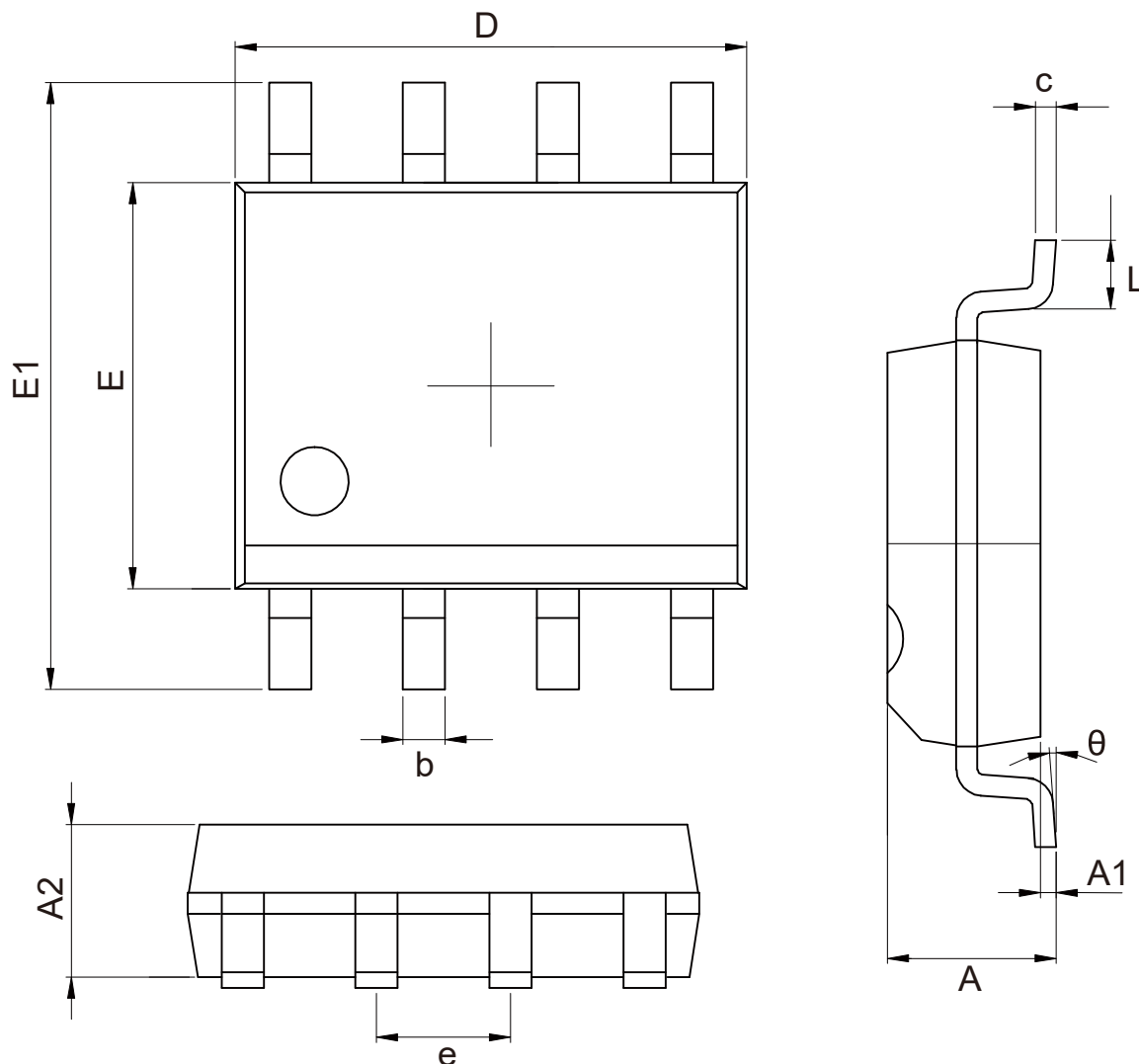


Figure 10. Maximum Safe Operating Area

SOP-8 Package Information:

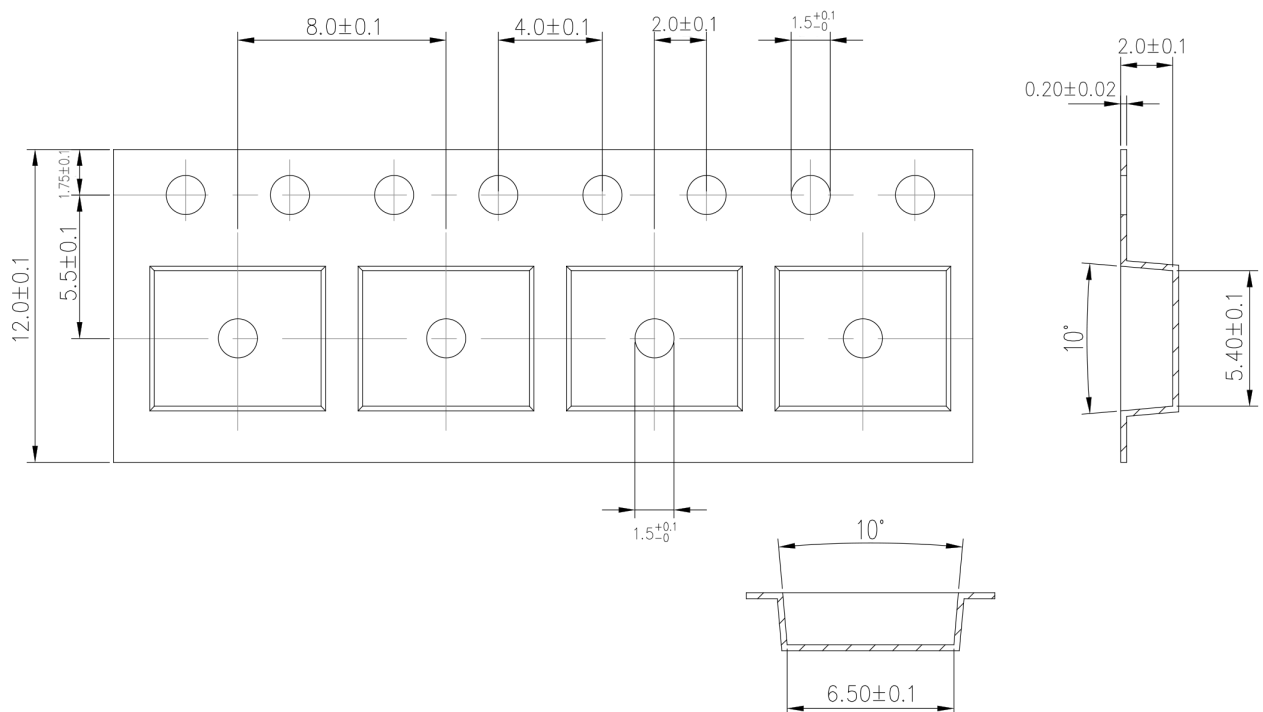
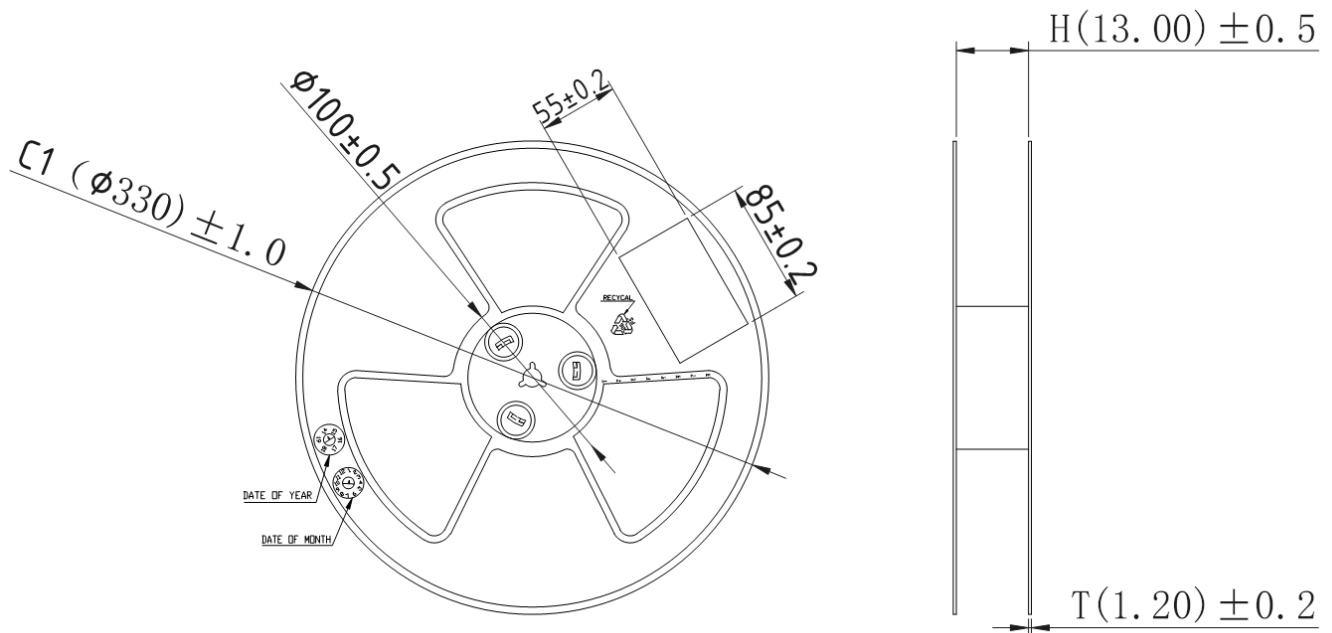


COMMON DIMENSIONS			
CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	1.350	—	1.750
A1	0.100	—	0.250
A2	1.350	—	1.550
b	0.330	—	0.510
c	0.170	—	0.250
D	4.700	—	5.100
E	3.800	3.900	4.000
E1	5.800	—	6.200
e	1.270BSC		
L	0.400	—	1.270
θ	0°	—	8°

Unit:mm

Tape & Reel Information

Dimensions in mm



Pulling direction 

Marking Information:

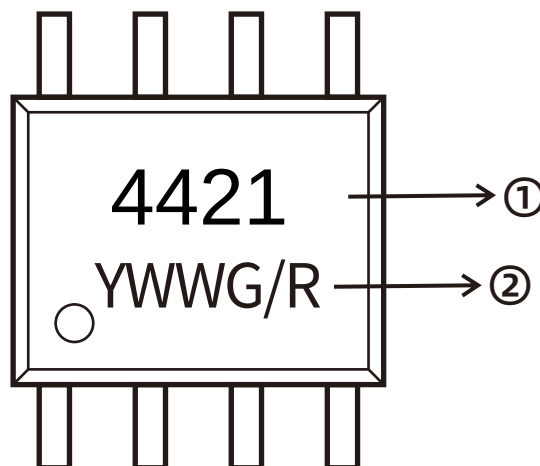
①. Part NO.

②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2025-01-09	Release of final version

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