

FEATURES

- Low On-State Resistance
- Low Total Gate Charge and Capacitance Losses
- Small Footprint for Compact Design
- RoHS Compliant and Halogen Free

ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	VALUE	UNITS
Drain-to-Source Voltage		V _{DS}	30	V
Gate-to-Source Voltage		V _{GS}	±20	V
Drain Current ⁽¹⁾	T _C = +25°C	I _D	120	A
	T _C = +100°C		66	
	T _A = +25°C		24	
	T _A = +70°C		19	
Drain Current (Pulse) ⁽²⁾		I _{DM}	240	A
Total Dissipation	T _C = +25°C	P _D	59.5	W
	T _C = +100°C		23	
	T _A = +25°C		2.5	
	T _A = +70°C		1.6	
Avalanche Current ⁽³⁾		I _{AS}	38	A
Avalanche Energy ⁽³⁾		E _{AS}	72.2	mJ
Junction Temperature		T _J	+150	°C
Storage Temperature Range		T _{STG}	-55 to +150	°C
Lead Temperature (Soldering, 10s)			+260	°C

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

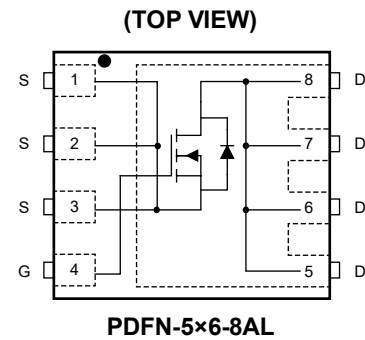
NOTES:

1. The current will be limited by PCB, thermal design and operating temperature.
2. $t_{PLUSE} < 10\mu\text{s}$
3. Parts are 100% tested at $V_{GS} = 10\text{V}$, $I_L = 28\text{A}$, and $E_{AS} = 39.2\text{mJ}$.

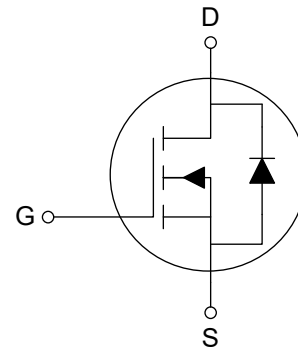
PRODUCT SUMMARY

$R_{DS(on)}$ (TYP) $V_{GS} = 10\text{V}$	$R_{DS(on)}$ (MAX) $V_{GS} = 10\text{V}$	I_D (MAX) $T_C = +25^\circ\text{C}$
2.3m Ω	2.9m Ω	120A

PIN CONFIGURATION



EQUIVALENT CIRCUIT



APPLICATIONS

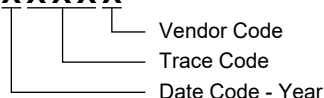
- CPU Power Delivery
- DC/DC Converter
- Power Load Switch
- Notebook Battery Management

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGMNQ40430	PDFN-5×6-8AL	-55°C to +150°C	SGMNQ40430TPDA8G/TR	SGM40430 TPDA8 XXXXXX	Tape and Reel, 4000

MARKING INFORMATION

NOTE: XXXXX = Date Code, Trace Code and Vendor Code.

XXXXX

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

THERMAL RESISTANCE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNITS
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	2.1	°C/W
Junction-to-Ambient Thermal Resistance ⁽¹⁾	$R_{\theta JA}$	49	°C/W

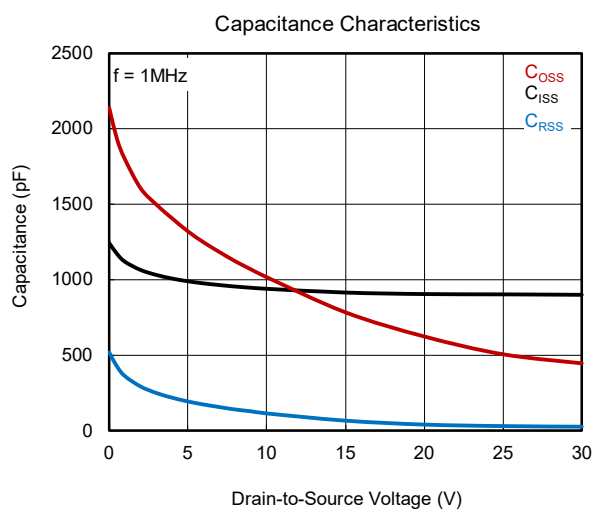
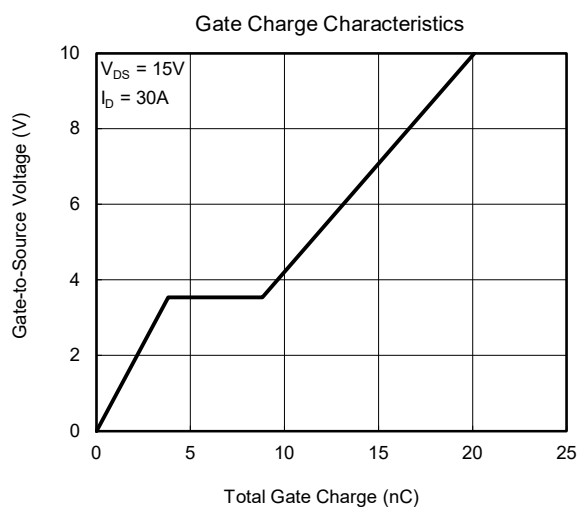
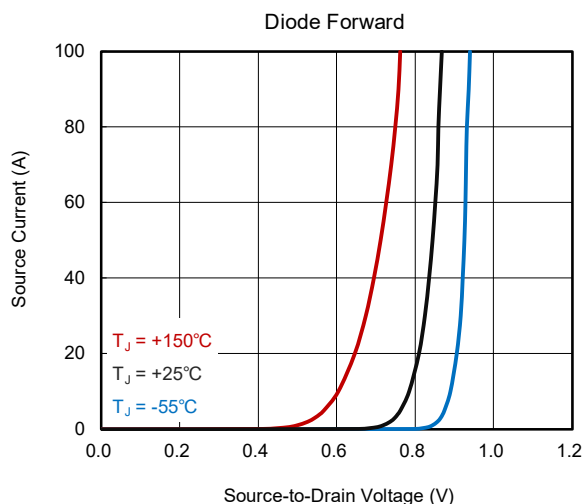
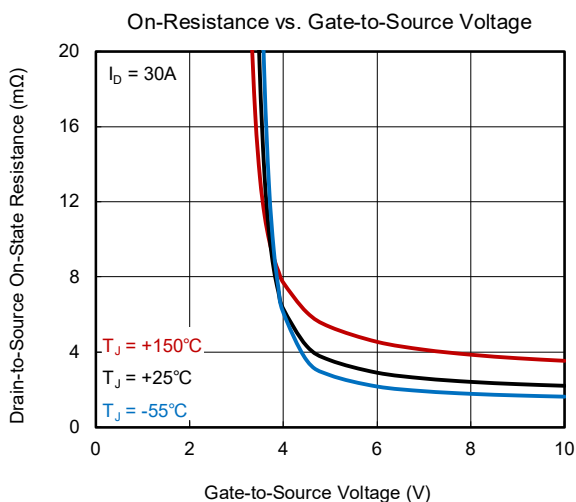
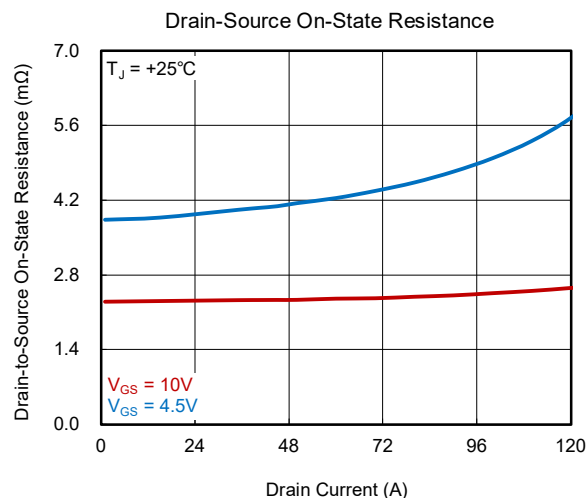
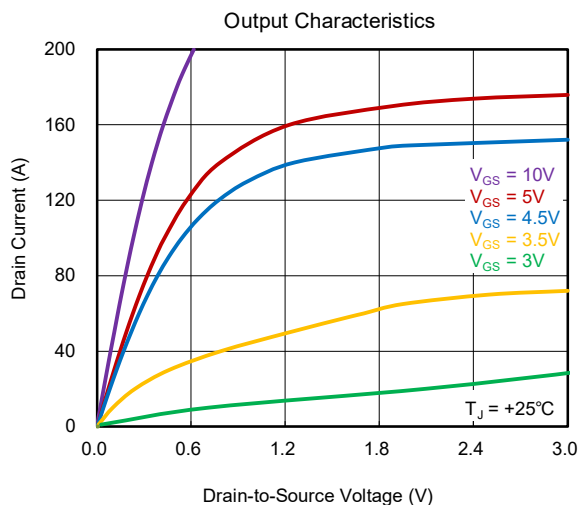
NOTE: 1. $R_{\theta JA}$ is determined with the device mounted on one square inch of copper pad, 2oz copper on FR4 board.

ELECTRICAL CHARACTERISTICS

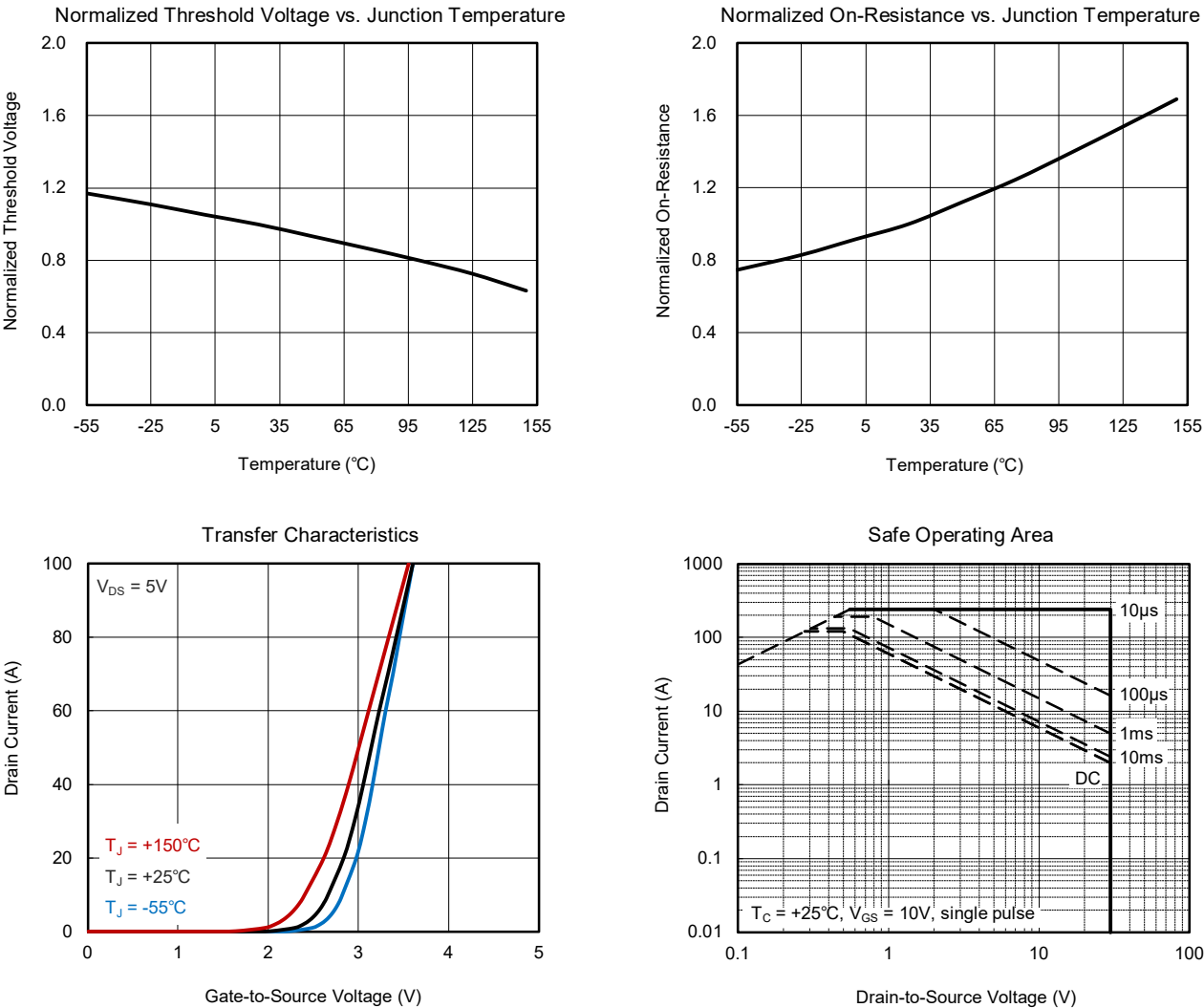
(T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Static OFF Characteristics							
Drain-to-Source Breakdown Voltage	V _{BR_DSS}	V _{GS} = 0V, I _D = 250μA		30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0V, V _{DS} = 24V				1	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V				±100	nA
Static ON Characteristics							
Gate-to-Source Threshold Voltage	V _{GS_TH}	V _{GS} = V _{DS} , I _D = 250μA		1.2	1.6	2.2	V
Drain-to-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 30A			2.3	2.9	mΩ
		V _{GS} = 4.5V, I _D = 25A			4.3	6.0	
Forward Transconductance	g _{FS}	V _{DS} = 1.5V, I _D = 15A			41		S
Gate Resistance	R _G	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz			1		Ω
Diode Characteristics							
Diode Forward Voltage	V _{F_SD}	V _{GS} = 0V, I _S = 10A			0.8	1.1	V
Reverse Recovery Time	t _{RR}	V _{GS} = 0V, I _S = 30A, di/dt = 100A/μs			38.8		ns
Reverse Recovery Charge	Q _{RR}				31.8		nC
Dynamic Characteristics							
Input Capacitance	C _{ISS}	V _{GS} = 0V, V _{DS} = 15V, f = 1MHz			971		pF
Output Capacitance	C _{OSS}				810		
Reverse Transfer Capacitance	C _{RSS}				73		
Total Gate Charge	Q _G	V _{DS} = 15V, I _D = 30A	V _{GS} = 10V		20.1		nC
			V _{GS} = 4.5V		9.9		
Gate-to-Source Charge	Q _{GS}	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 30A			3.8		
Gate-to-Drain Charge	Q _{GD}				5		
Switch Characteristics							
Turn-On Delay Time	t _{D_ON}	V _{GS} = 10V, V _{DS} = 15V, I _D = 15A, R _G = 3Ω			5.8		ns
Rise Time	t _R				25.6		
Turn-Off Delay Time	t _{D_OFF}				15.5		
Fall Time	t _F				4		

TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (continued)



REVISION HISTORY

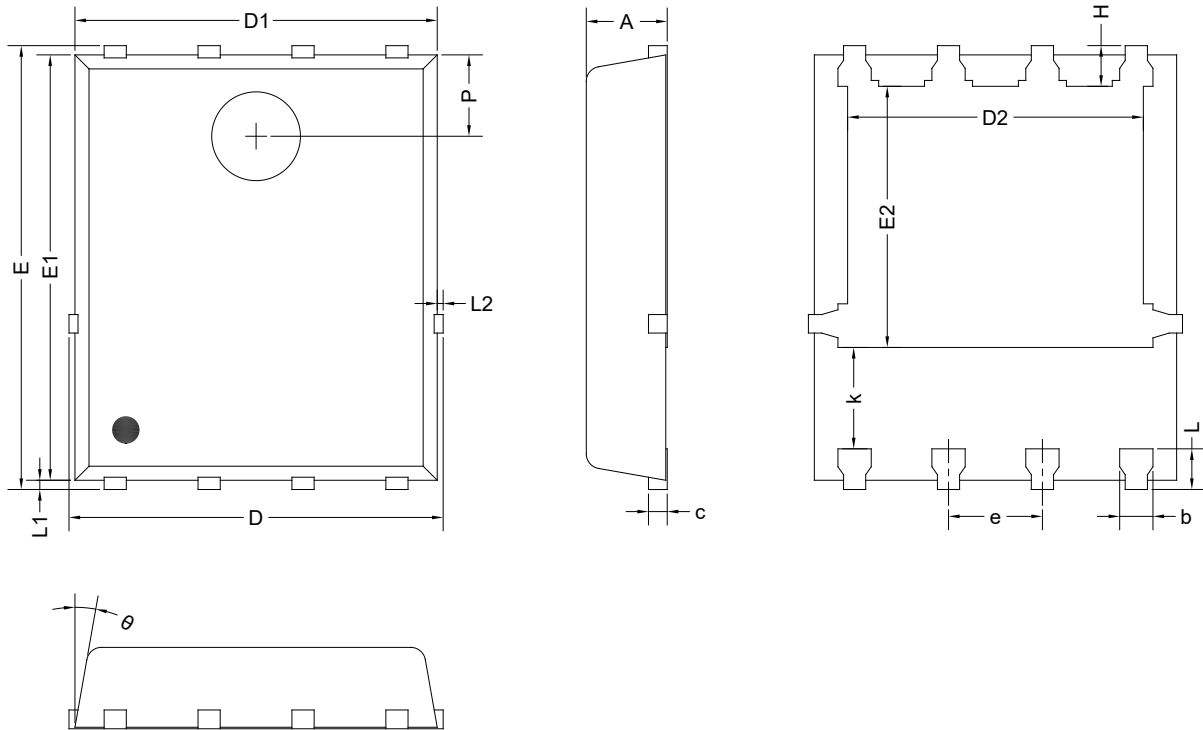
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

AUGUST 2024 – REV.A to REV.A.1		Page
Updated absolute maximum ratings, and product summary		1
Updated thermal resistance maximum ratings		2
Updated electrical characteristics		3
Updated typical performance characteristics		4, 5

Changes from Original (OCTOBER 2023) to REV.A		Page
Changed from Product Preview to Production Data		All

PACKAGE OUTLINE DIMENSIONS

PDFN-5×6-8AL



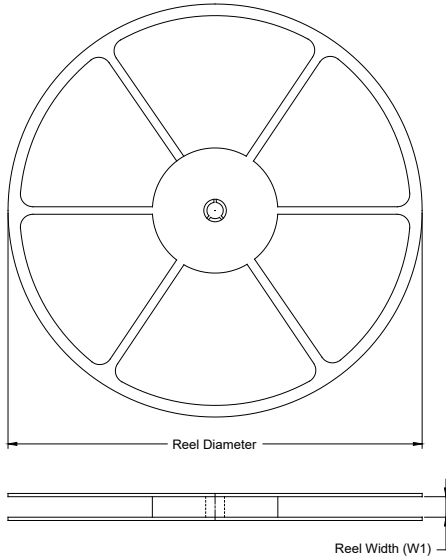
Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	1.000	1.100	1.200
b	0.340	0.450	0.540
c	0.210	0.250	0.340
D	4.800	5.000	5.100
D1	4.800	4.900	5.000
D2	3.900	4.000	4.100
E	5.900	6.000	6.100
E1	5.700	5.750	5.800
E2	3.430	3.530	3.630
e	1.270 BSC		
H	0.450	0.550	0.650
k	1.170	1.370	1.570
L	0.450	0.550	0.650
L1	0.000	0.130	0.200
L2	0.000	0.080	0.150
P	1.000	1.100	1.200
θ	8°	10°	12°

NOTE: This drawing is subject to change without notice.

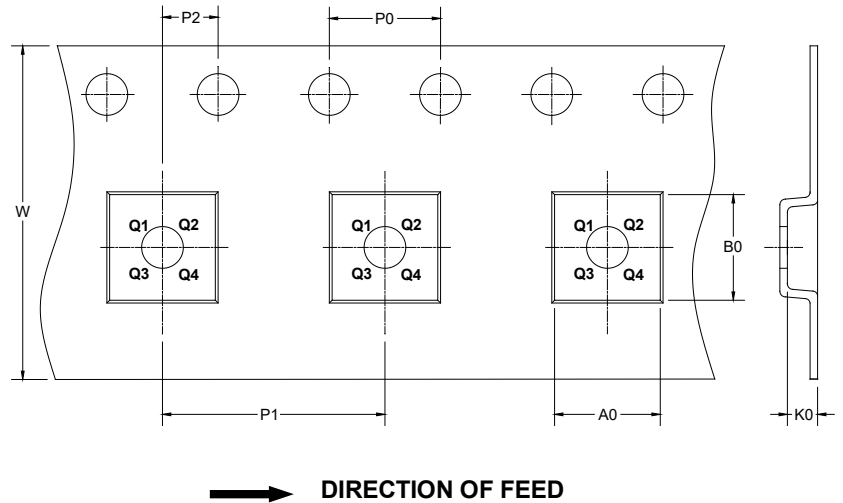
PACKAGE INFORMATION

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

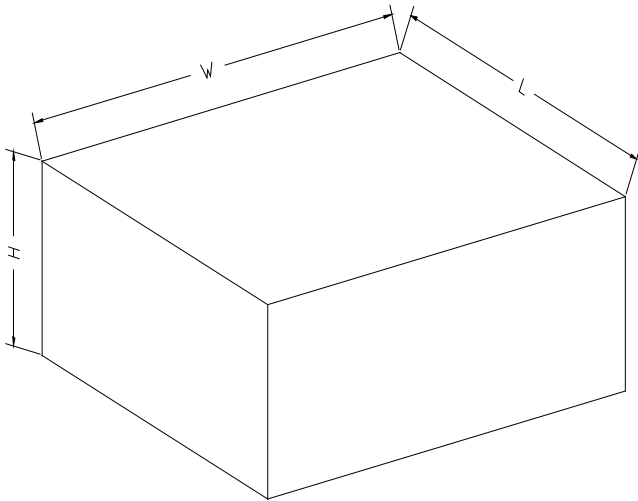
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
PDFN-5×6-8AL	13"	12.4	6.45	5.30	1.40	4.0	8.0	2.0	12.0	Q1

DD0001

PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13"	386	280	370	5

DP0002