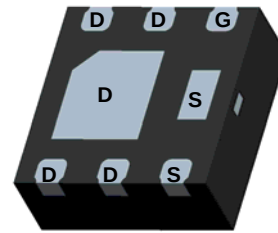
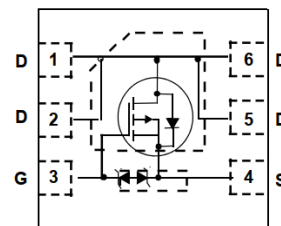


WPM2065A
Single P-Channel, -20V, -9.4A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

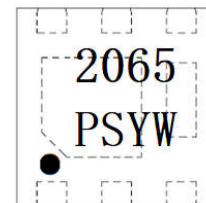
V_{DS} (V)	Max. $R_{DS(on)}$ (m Ω)
-20	21 @ $V_{GS}=-4.5V$
	28 @ $V_{GS}=-2.5V$
	43 @ $V_{GS}=-1.8V$
ESD Rating: 2000V HBM	


DFN2x2-6L

Pin configuration (Top view)
Descriptions

The WPM2065A is P-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 DC-DC conversion, power switch and charging circuit. Standard Product WPM2065A is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- ESD protection
- Small package DFN2x2-6L



2065 = Device Code
 PS = Special Code
 YW = Year& Week(A~z)

Applications

- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device
- Driver for Relay, Solenoid, Motor, LED etc
- Charging

Marking
Order information

Device	Package	Shipping
WPM2065A-6/TR	DFN2x2-6L	3000/Tape&Reel

Absolute Maximum ratings

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		V _{DS}	-20		V
Gate-Source Voltage		V _{GS}	±10		
Continuous Drain Current	T _A =25°C	I _D	-9.4	-7.2	A
	T _A =70°C		-7.5	-5.8	
Maximum Power Dissipation ^b	T _A =25°C	P _D	2.8	1.6	W
	T _A =70°C		1.8	1.0	
Pulsed Drain Current ^c		I _{DM}	-50		A
Operating Junction Temperature		T _J	-55 to 150		°C
Storage Temperature Range		T _{STG}	-55 to 150		°C

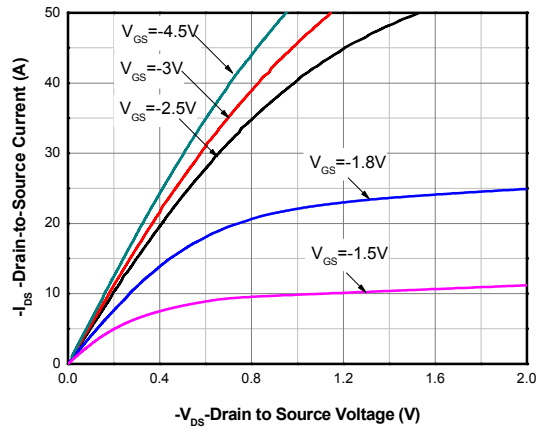
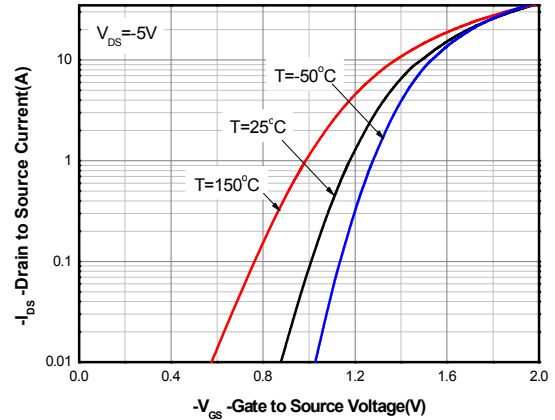
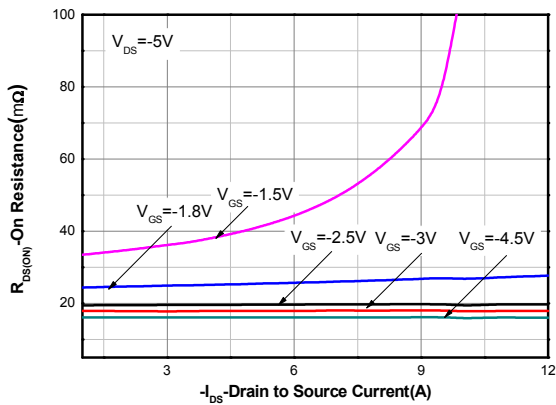
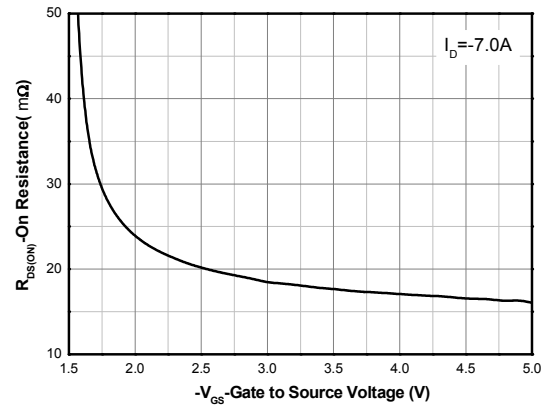
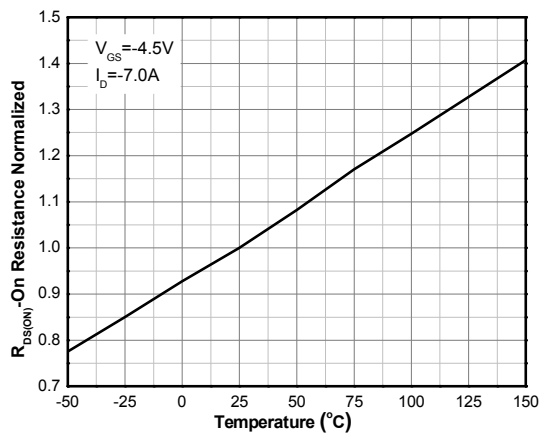
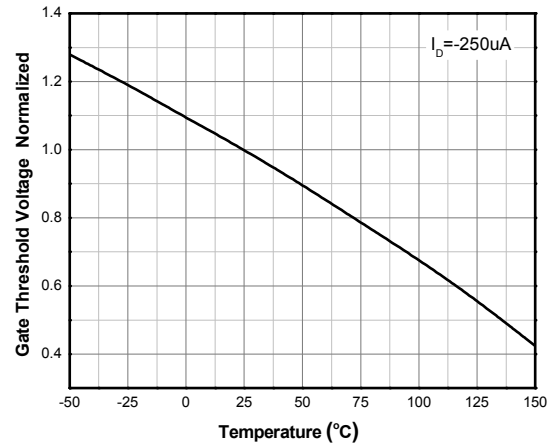
Thermal resistance ratings

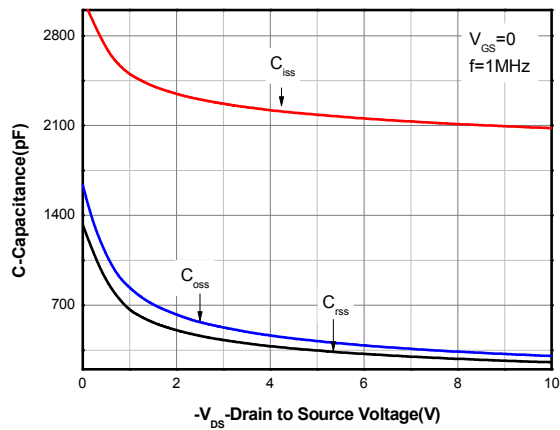
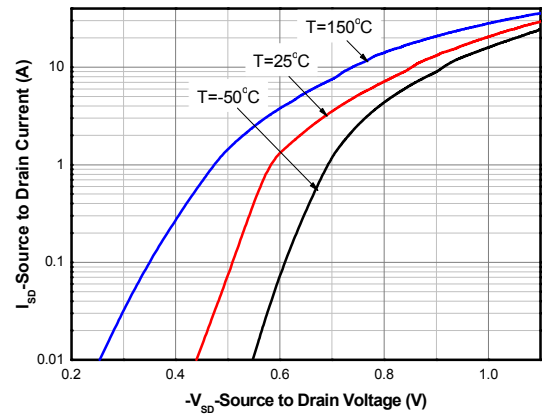
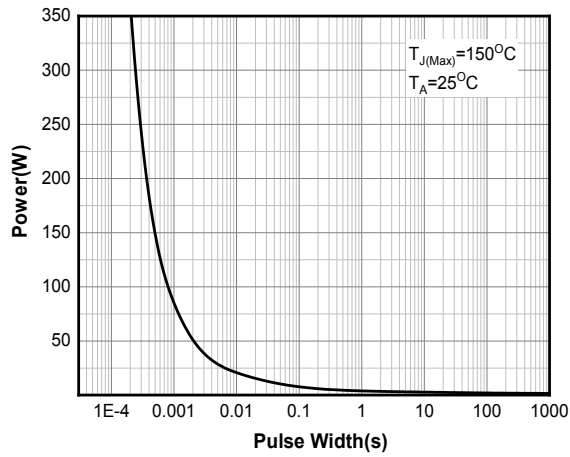
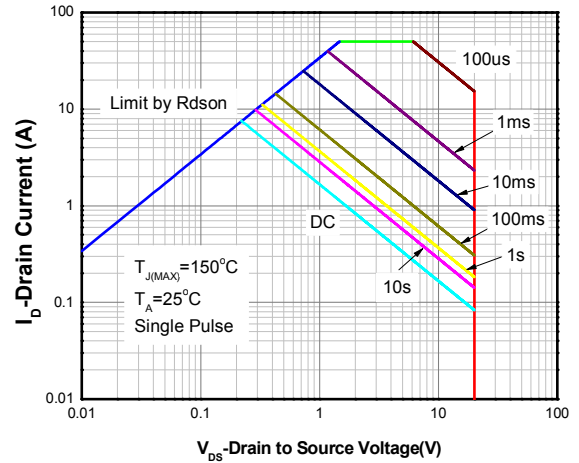
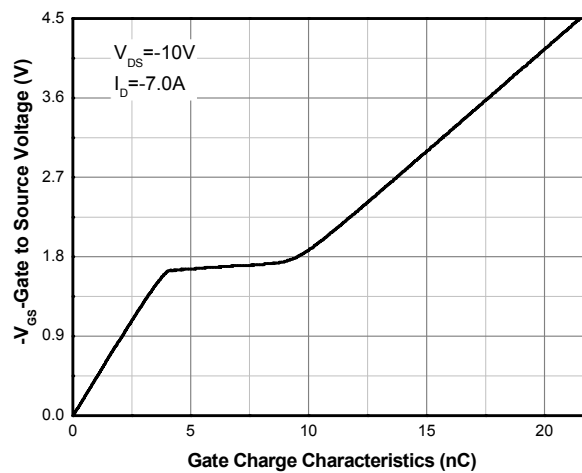
Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	36	44	$^{\circ}\text{C/W}$
	Steady State		63	75	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	8	9	

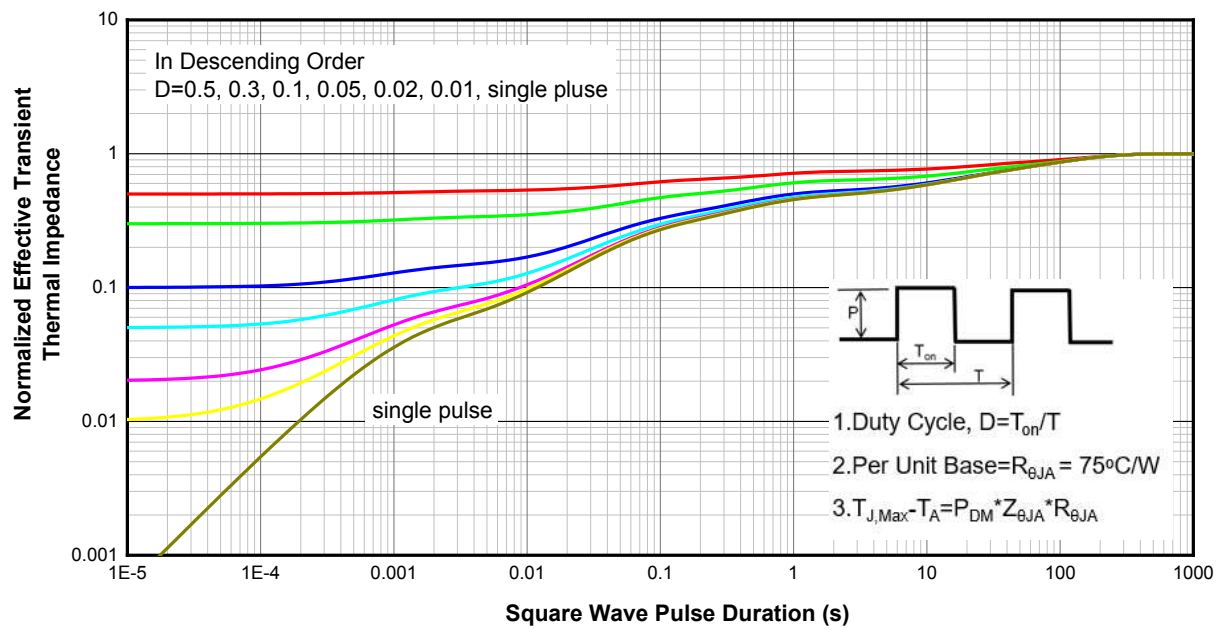
- FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm² area).
- The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ $t \leq 10\text{s}$ value and the $T_{J(MAX)}=150^{\circ}\text{C}$.
- Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^{\circ}\text{C}$, the maximum allowed junction temperature of 150°C .
- The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = -250uA	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-16V, V _{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = -250uA	-0.4	-0.7	-1	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -7A		16.5	21	mΩ
		V _{GS} = -2.5V, I _D = -5A		20	28	
		V _{GS} = -1.8V, I _D = -3A		26	43	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0MHz, V _{DS} = -10V		2080		pF
Output Capacitance	C _{OSS}			304		
Reverse Transfer Capacitance	C _{RSS}			255		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = -4.5 V, V _{DS} = -10 V, I _D =-7 A		21.5		nC
Threshold Gate Charge	Q _{G(TH)}			1.6		
Gate-to-Source Charge	Q _{GS}			4.1		
Gate-to-Drain Charge	Q _{GD}			4.5		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = -4.5 V, V _{DS} = -10 V, R _L = 3Ω, R _G = 6Ω		17.7		ns
Rise Time	tr			53.7		
Turn-Off Delay Time	td(OFF)			116.2		
Fall Time	tf			90.2		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = -1A		-0.8	-1.5	V

Typical Characteristics (Ta=25°C, unless otherwise noted)

Output characteristics

Transfer Characteristics

On-Resistance vs. Drain current

On-Resistance vs. Gate-to-Source Voltage

On-Resistance vs. Junction Temperature

Threshold Voltage vs. Temperature

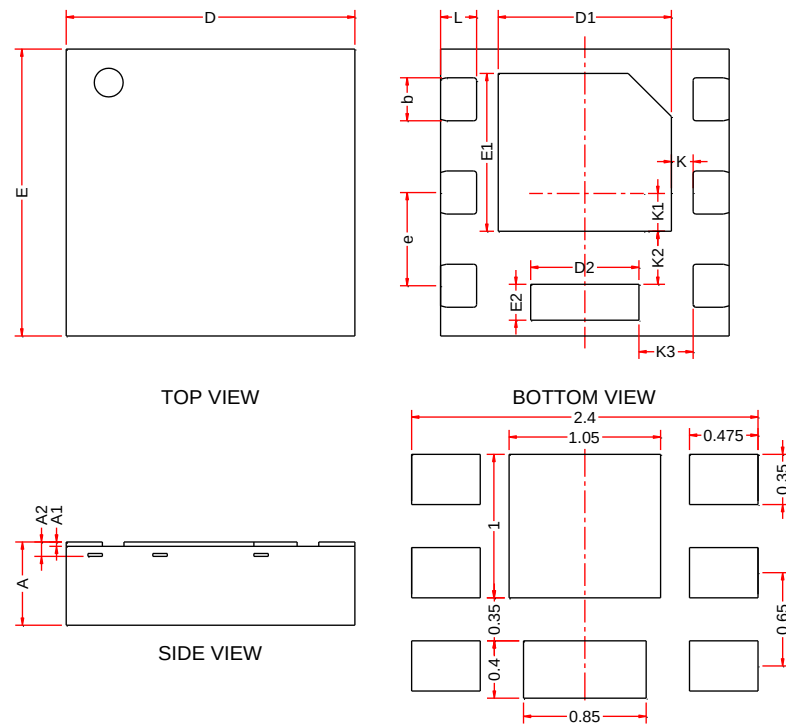

Capacitance

Body Diode Forward Voltage

Single pulse power

Safe operating power

Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

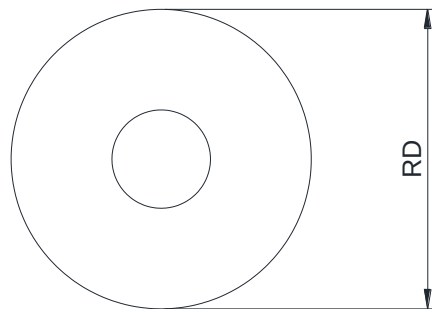
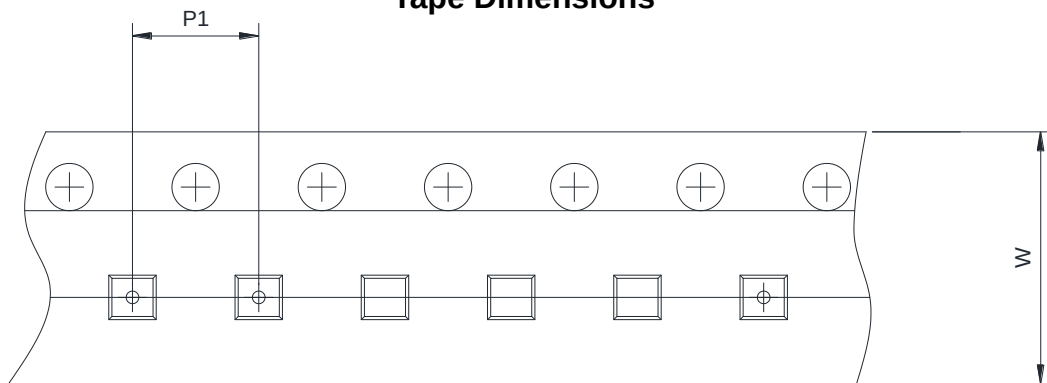
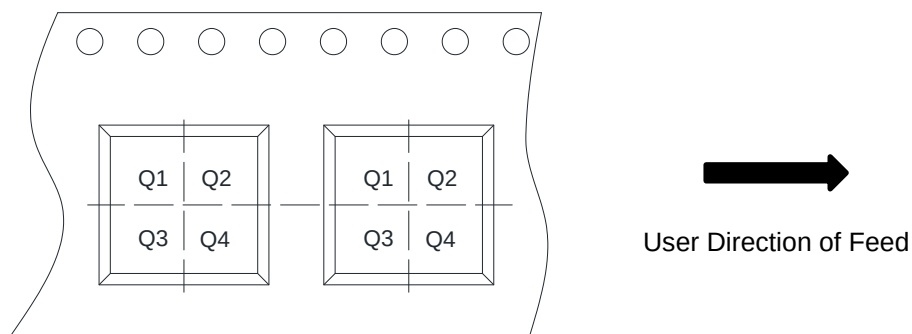
PACKAGE OUTLINE DIMENSIONS

DFN2x2-6L



RECOMMENDED LAND PATTERN(unit:mm)

Symbol	Dimensions in Millimeters		
	Min.	Nom	Max.
A	0.50	---	0.65
A1	0.00	0.02	0.05
A2	0.10REF		
b	0.25	0.30	0.35
D	1.90	2.00	2.10
D1	1.10	1.20	1.30
D2	0.65	0.75	0.85
E	1.90	2.00	2.10
E1	1.00	1.10	1.20
E2	0.15	0.25	0.35
e	0.65BSC		
L	0.20	0.25	0.30
K	0.05	0.15	0.25
K1	0.17	0.27	0.37
K2	0.27	0.37	0.47
K3	0.28	0.38	0.48

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	☒ 7 inch ☐ 13 inch
W	Overall width of the carrier tape	☒ 8 mm ☐ 12 mm ☐ 16 mm
P1	Pitch between successive cavity centers	☐ 2 mm ☒ 4 mm ☐ 8 mm
Pin1	Pin1 Quadrant	☒ Q 1 ☐ Q 2 ☐ Q 3 ☐ Q 4