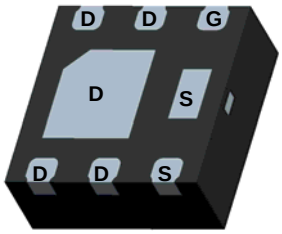
WPM2065A

Single P-Channel, -20V, -9.4A, Power MOSFET

Http://www.sh-willsemi.com

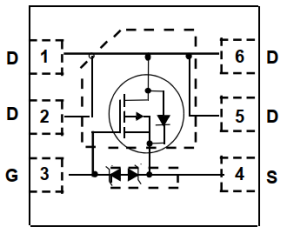
V_{DS} (V)	Max. $R_{DS(on)}$ (mΩ)
-20	21 @ V_{GS}=-4.5V
	28 @ V_{GS}=-2.5V
	43 @ V_{GS}=-1.8V
ESD Rating: 2000V HBM	



DFN2x2-6L

Descriptions

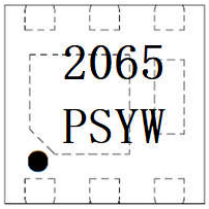
The WPM2065A is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM2065A is Pb-free.



Pin configuration (Top view)

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)

Marking

Applications

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

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 ≤ 10 s	$R_{\theta JA}$	36	44	°C/W
	Steady State		63	75	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	8	9	

a. FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm^2 area).

b. The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ t≤10s value and the $T_{J(MAX)}$=150°C.

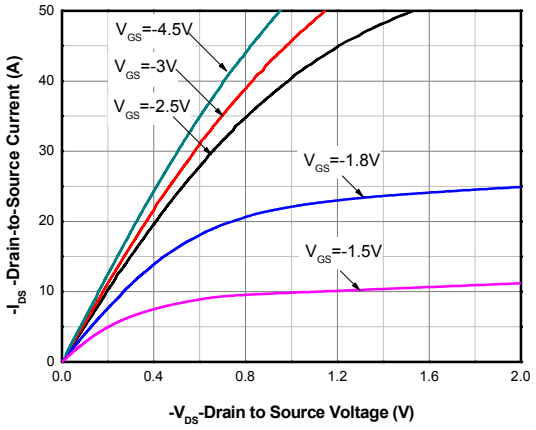
c. Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial T_J =25°C, the maximum allowed junction temperature of 150°C.

d. The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

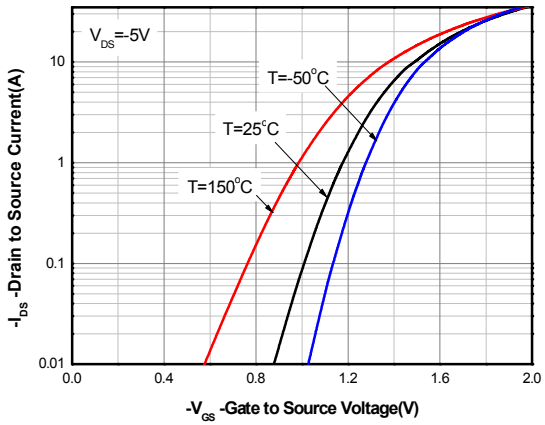
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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

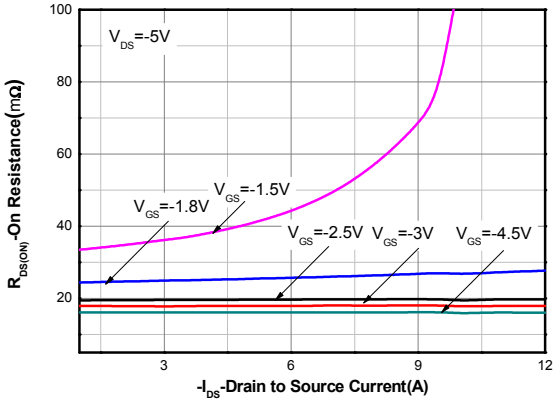
Typical Characteristics (Ta=25°C, unless otherwise noted)



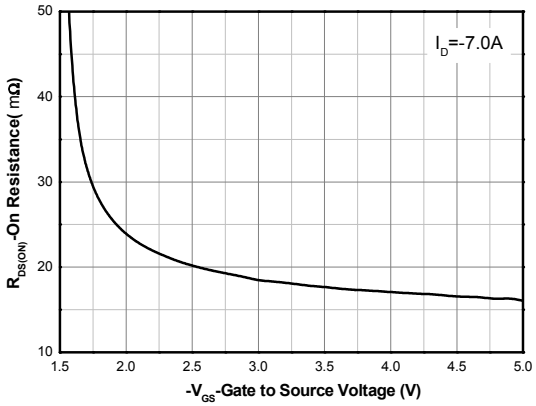
Output characteristics



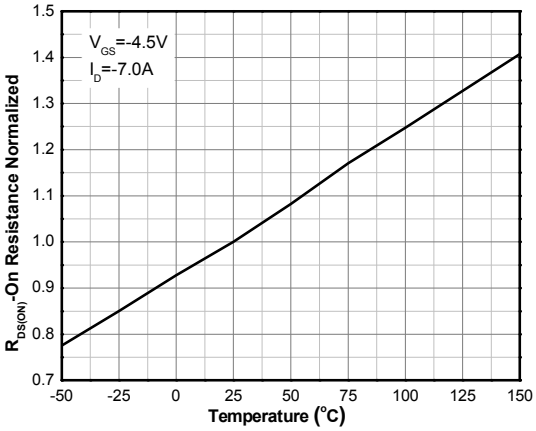
Transfer Characteristics



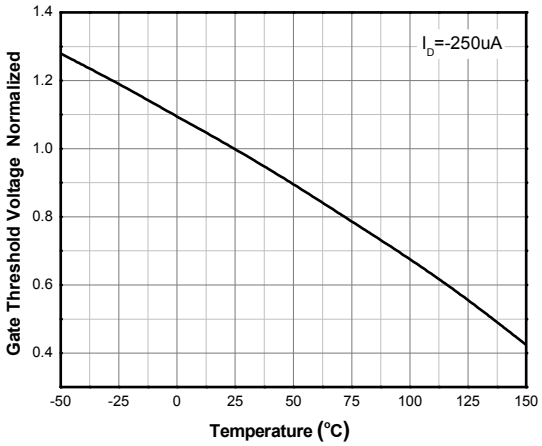
On-Resistance vs. Drain current



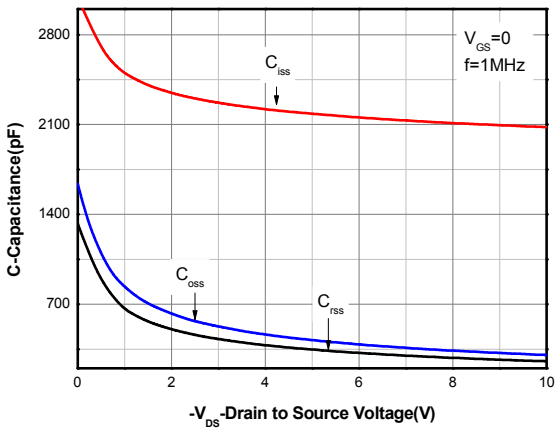
On-Resistance vs. Gate-to-Source Voltage



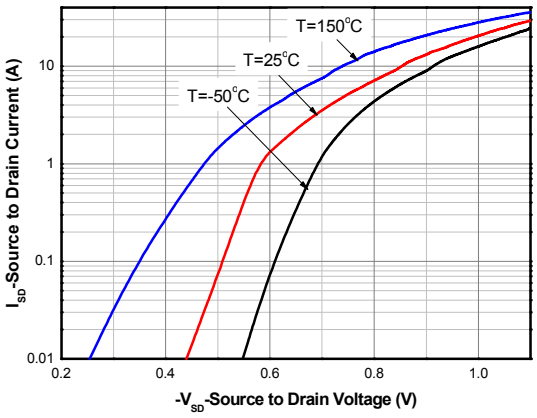
On-Resistance vs. Junction Temperature



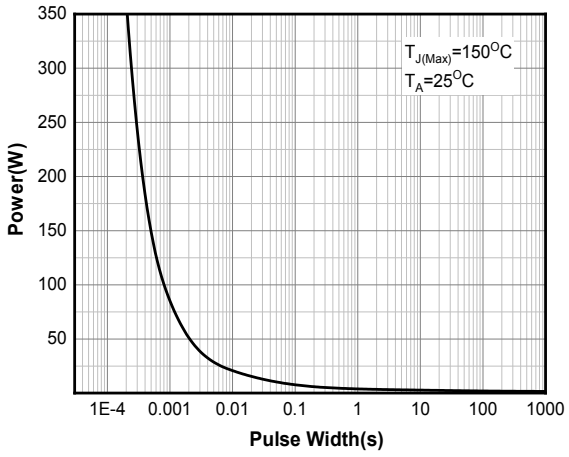
Threshold Voltage vs. Temperature



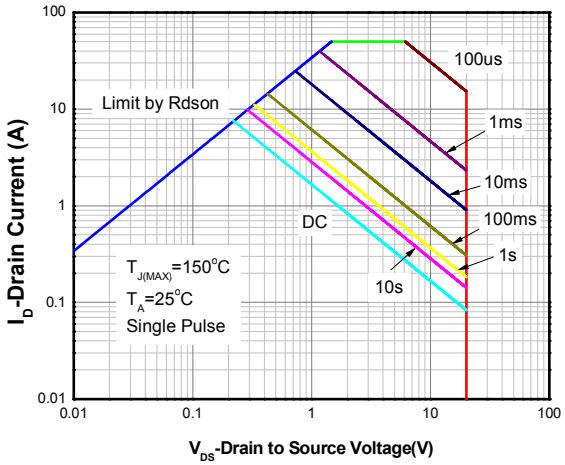
Capacitance



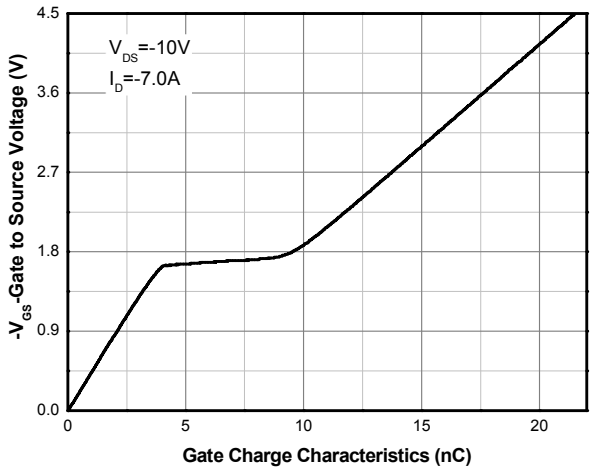
Body Diode Forward Voltage



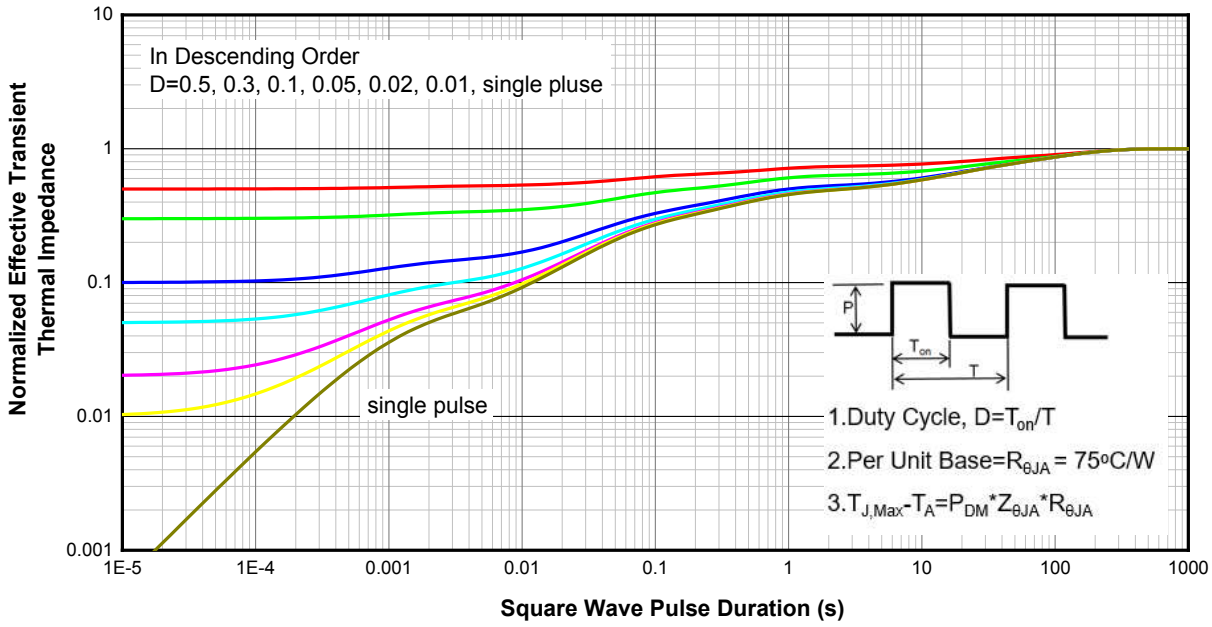
Single pulse power



Safe operating power



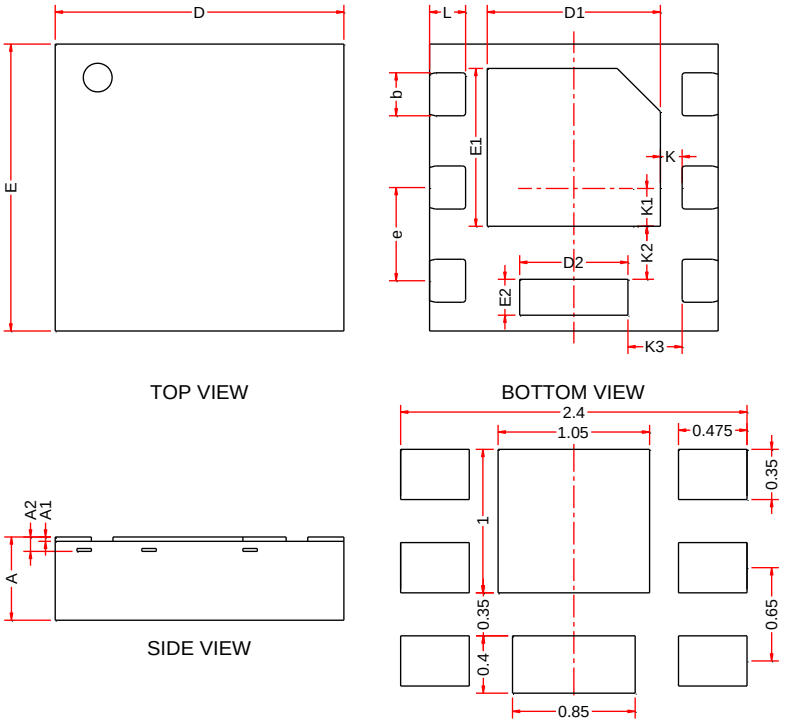
Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS

DFN2x2-6L

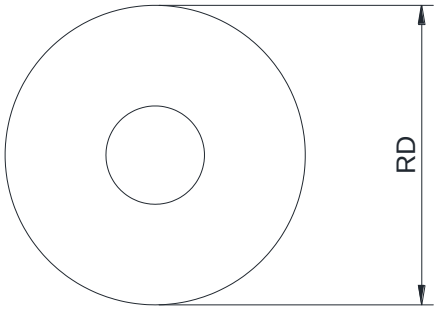


RECOMMENDED LAND PATTERN(unit:mm)

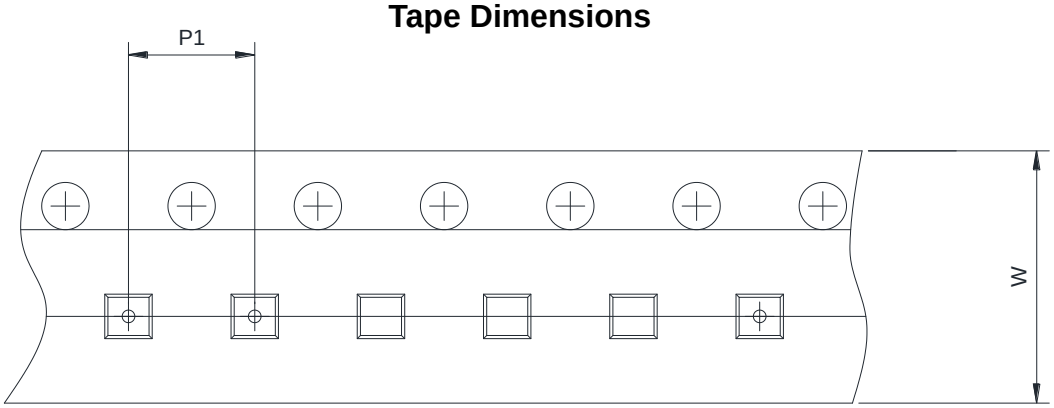
Symbol	Dimensions in Millimeters		
	Min.	Nom	Max.
A	0.50	---	0.65
A1	0.00	0.02	0.05
A2		0.10REF	
b	0.25	0.30	0.35
D	1.90	2.00	2.10
D1	1.10	1.20	1.30
D2	0.65	0.75	0.85
E	1.90	2.00	2.10
E1	1.00	1.10	1.20
E2	0.15	0.25	0.35
e		0.65BSC	
L	0.20	0.25	0.30
K	0.05	0.15	0.25
K1	0.17	0.27	0.37
K2	0.27	0.37	0.47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

TAPE AND REEL INFORMATION

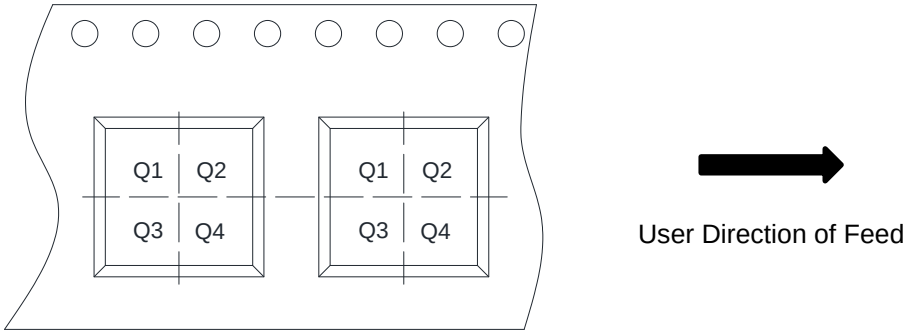
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☑ 7inch ☐ 13inch
W	Overall width of the carrier tape	☑ 8mm ☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm ☑ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☑ Q1 ☐ Q2 ☐ Q3 ☐ Q4

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