Power Selector Load Switch

General Description

The EM5028 is a ultra-low on-resistance, power selector load switch that built-in 2 channel without parasitic body diode between drain and source. The EM5028 provides ultra-low on-resistance as 30mΩ/70mΩ. The output voltage can be selected by SEL input signal. It has built in reverse current protection, gate non overlapping circuit protection, short circuit protection and over temperature protection. The EM5028 is available in DFN3.0X3.0-08 package.

Ordering Information

Part Number	Package	Remark
EM5028V	DFN3.0X3.0-08	

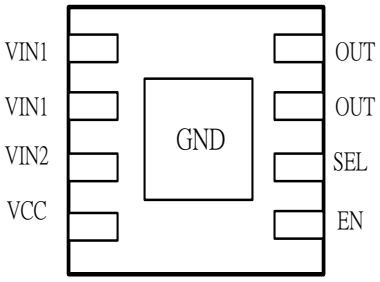
Features

- Low Ron dual channel load switch
- Two-input, one output
- Reverse current protection when switch off
- Gate1 and Gate2 non overlapping circuit
- Low shutdown Current
- Short Circuit Protection
- Over Temperature Protection
- Soft Start and output discharge circuit
- Reverse Voltage Protection
- CMOS and TTL compatible control Input

Applications

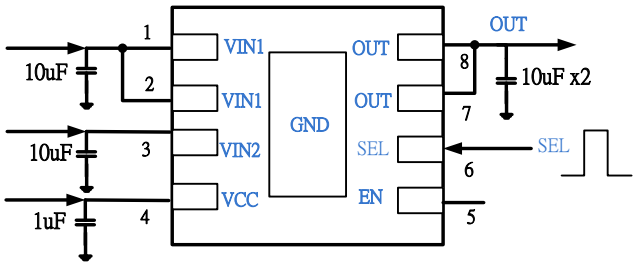
- USB
- Notebook & Netbook &MB
- SD Card

Pin Configuration



DFN3.0X3.0-08

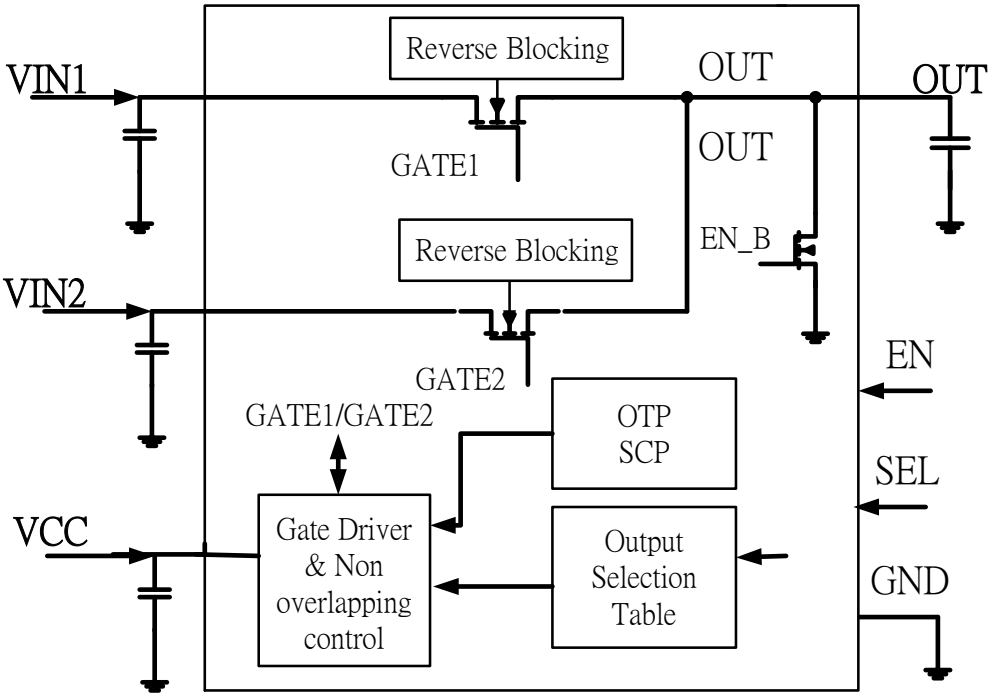
Typical Application Circuit



Pin Assignment

Pin Name	Pin No.	Pin Function
VIN1	1,2	Primary Power Input
VIN2	3	Secondary Power Input
VCC	4	Gate Driver supply for internal SEL Switch
OUT	7,8	Power Switch Output
EN	5	Enable Input
SEL	6	The output connected to VIN1 if this pin is high. Otherwise, the output connected to higher of VIN1 and VIN2.
GND	Thermal PAD	Ground.

Function Block Diagram



Absolute Maximum Ratings (Note1)

V_{IN} ---------- -0.3V to +6.0V
Other Pins---------- -0.3V to V_{IN}
Power Dissipation, P_D @ T_A = 25°C, DFN3.0X3.0-08 ---------- 1.42W
Package Thermal Resistance, θ_{JA}, DFN3.0X3.0-08 (Note 2)---------- 70°C/W
Junction Temperature---------- 125°C
Lead Temperature (Soldering, 10 sec.)---------- 260°C
Storage Temperature ---------- –65°C to 150°C
ESD susceptibility (Note3)
HBM (Human Body Mode)---------- 2KV
MM (Machine Mode)---------- 200V
CDM(Charge Device Mode) ----------1KV

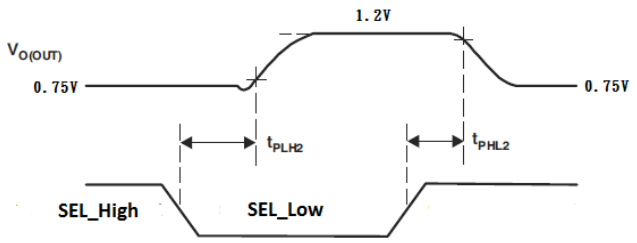
Recommended Operating Conditions (Note4)

Parameter	Symbol	Ratings			
		Min.	Typ.	Max.	Unit
VCC Input Voltage	VCC	3		5.5	V
CH1 Input Voltage	VIN1	0.5		VCC-2	V
CH2 Input Voltage	VIN2	0.5		VCC-2	V
Output Current	IO			3	A
Junction Temperature	TJ	-40	25	125	° C

True Table

SEL	VIN1	VIN2	OUT
0	0	0	0
0	<0.7	0.7	VIN2
0	>0.7	0.7	VIN1
1	0.5V~VCC-2V	0.7	VIN1

Switching Timing



Electrical Characteristics

V_{CC}=5V, T_A=25°C, unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
V_{CC} Input Section						
VCC Input Voltage	V_{CC}		3.0	-	5.5	V
POR Threshold	V_{CC_TH}			2.6	2.9	V
POR Hysteresis	V_{CC_HYS}		-	0.3	-	V
IN1/IN2 Input Voltage	$V_{1/2}$	V_{CNTL}=5V	0.5	-	2.5	V
VCC Input Current in Shutdown	I_{CC_SD}		-		5	uA
Quiescent Current	I_Q		-		150	uA
SEL control						
SEL High Level	V_{SEL_H}		1.1	-	-	V
SEL Low Level	V_{SEL_L}		-	-	0.3	V
SEL pin Input Current	I_{SEL}	SEL= 5V			1	uA
Enable						
Enable High Level	V_{EN}		1.1	-	-	V
Disable Low Level	V_{SD}		-	-	0.3	V
Enable Source Current	I_{EN}	VCNTL=5V, V_{EN}=0V	-	2	4	µA
Power Switch						
$R_{DS(ON)}$ SEL power switch 1	R_{ON1}		-	30		mohm
$R_{DS(ON)}$ SEL power switch 2	R_{ON2}		-	70		mohm
Thermal Protection						
Thermal Shutdown Temperature	T_{SD}		-	160	-	°C
Thermal Shutdown Hysteresis	T_{SDHYS}		-	40	-	°C
Control Timing						
Output rise time	T_R	VOUT=2V		60		us
VOUT Discharged Resistance	R_{PL}	EN=0V		100		ohm
Switch over rising propagation delay	T_{PLH2}			40		us
Switch over falling propagation delay	T_{PHL2}			40		us

Note 1. Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2. θ_{JA} is measured in the natural convection at T_A=25°C on a low effective thermal conductivity test board (Single layout, 1S) of JEDEC 51-3 thermal measurement standard.

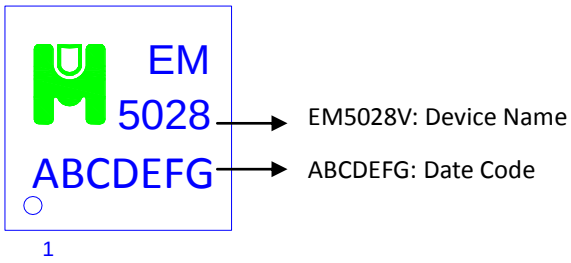
Note 3. Devices are ESD sensitive. Handling precaution is recommended.

Note 4. The device is not guaranteed to function outside its operating conditions.

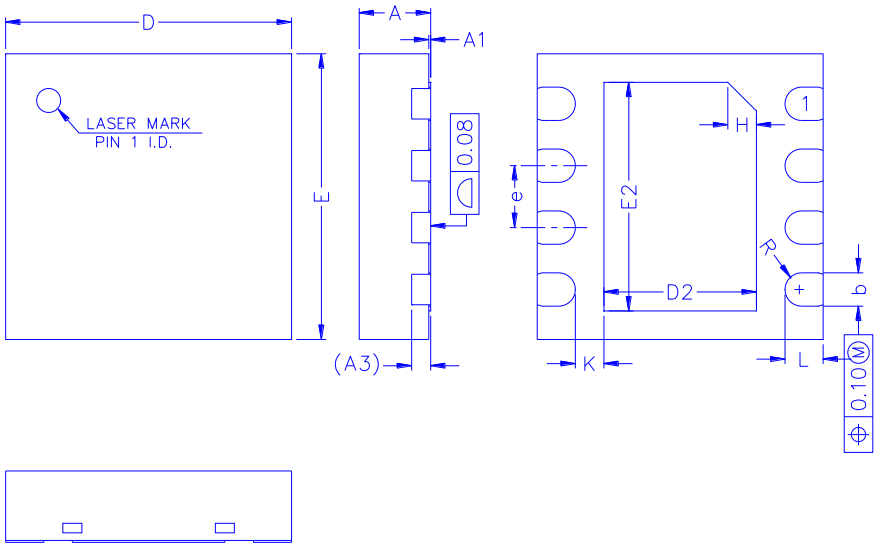
Note 5. EMC will review datasheet by quarter, and update new version.

Ordering & Marking Information

Device Name: EM5028V for DFN3.0X3.0-08



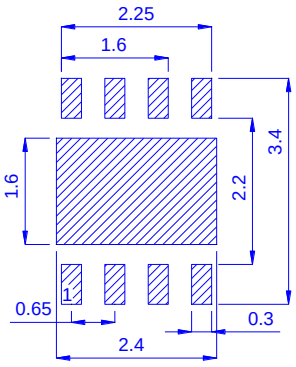
Outline Drawing



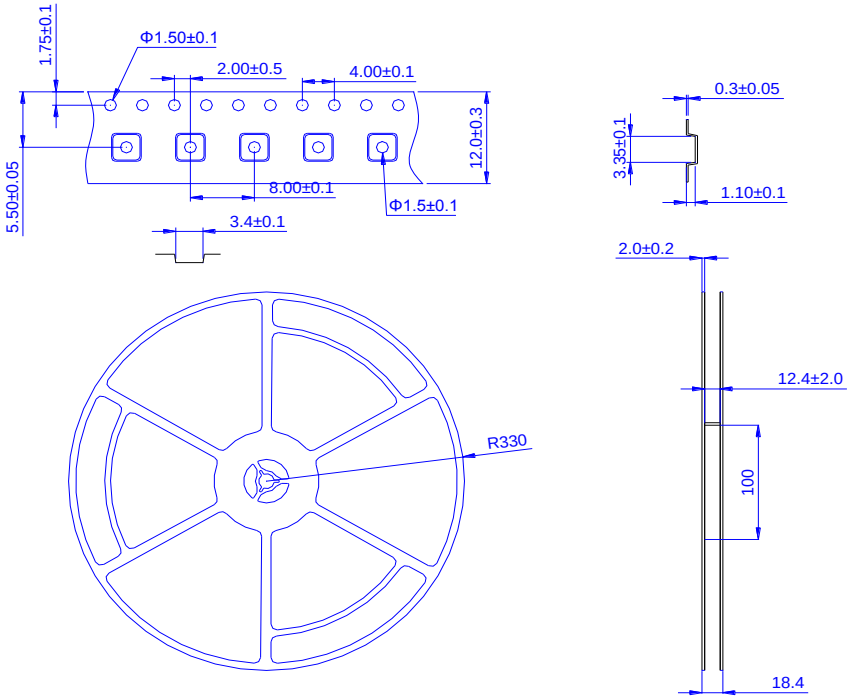
Dimension in mm

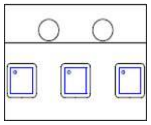
Dimension	A	A1	A3	b	D	E	D2	E2	e	H	K	L	R
Min.	0.7	0.00	0.2 REF	0.3	2.9	2.9	1.5	2.3	0.55	0.3REF	0.2	0.3	0.16
Typ.	0.75	0.02		0.35	3.0	3.0	1.6	2.4	0.65		0.3	0.4	
Max.	0.8	0.05		0.4	3.1	3.1	1.7	2.5	0.75		0.4	0.5	

Recommended minimum pads



Tape&Reel Information: 5000pcs/Reel



產品別	DFN3.0X3.0-08
Reel 尺寸	13”
編帶方式	FEED DIRECTION 
前空格	50
後空格	50
裝箱數	
滿捲數量	5K
捲/內盒比	1：1
內盒滿箱數	5K
內/外箱比	10：1
外箱滿箱數	50K