

## P-Channel Enhancement Mode Power MOSFET

### Description

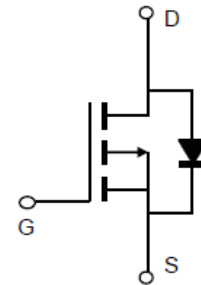
The RM30P30D3 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge. This device is suitable for use as a load switch or in PWM applications.

### General Features

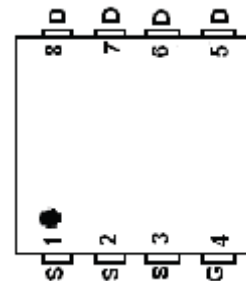
- $V_{DS} = -30V, I_D = -30A$   
 $R_{DS(ON)} < 13m\Omega @ V_{GS} = -4.5V$   
 $R_{DS(ON)} < 10m\Omega @ V_{GS} = -10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface mount package

### Application

- PWM applications
- Load switch
- Power management
- Halogen-free



Schematic diagram



DFN 3x3 EP top view

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
30P30	RM30P30D3	DFN3X3	Ø330mm	12mm	2500 units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-30	A
Drain Current-Pulsed <sup>(Note 1)</sup>	$I_{DM}$	-90	A
Maximum Power Dissipation	$P_D$	40	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ\text{C}$

### Thermal Characteristic

Thermal Resistance, Junction-to-Case <sup>(Note 2)</sup>	$R_{\theta JC}$	34	$^\circ\text{C/W}$
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## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250A$	-30	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250A$	-0.8	-	-2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-15A$	-	7	10	m $\Omega$
		$V_{GS}=-4.5V, I_D=-8A$	-	10	13	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-10V, I_D=-5A$	-	9	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{ISS}$	$V_{DS}=-25V, V_{GS}=0V,$ $F=1.0MHz$	-	2150	-	PF
Output Capacitance	$C_{OSS}$		-	430	-	PF
Reverse Transfer Capacitance	$C_{RSS}$		-	320	-	PF
<b>Switching Characteristics</b> (Note 4)						
Total Gate Charge	$Q_g$	$V_{DS}=-15V, I_D=-15A, V_{GS}=-10V$	-	35	-	nC
Gate-Source Charge	$Q_{gs}$		-	5	-	nC
Gate-Drain Charge	$Q_{gd}$		-	10	-	nC

### Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

# RATING AND CHARACTERISTICS CURVES (RM30P30D3)

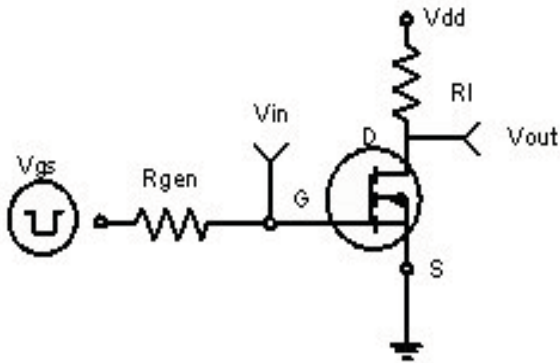


Figure 1 Switching Test Circuit

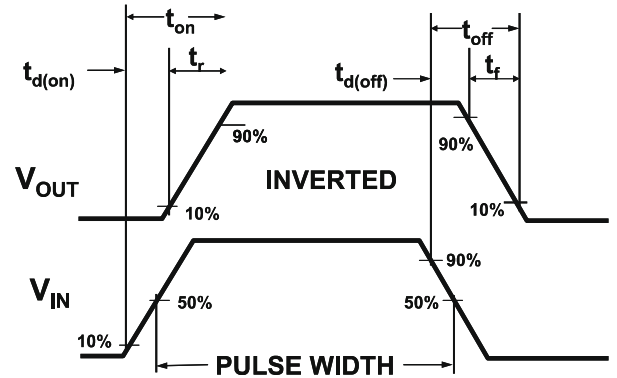


Figure 2 Switching Waveforms

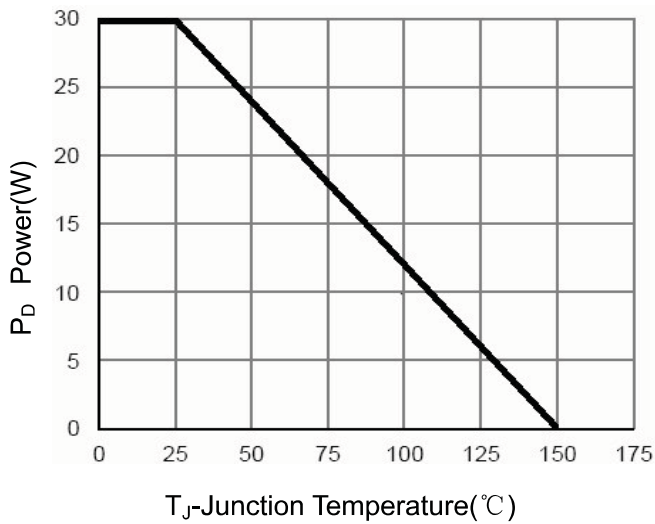


Figure 3 Power Dissipation

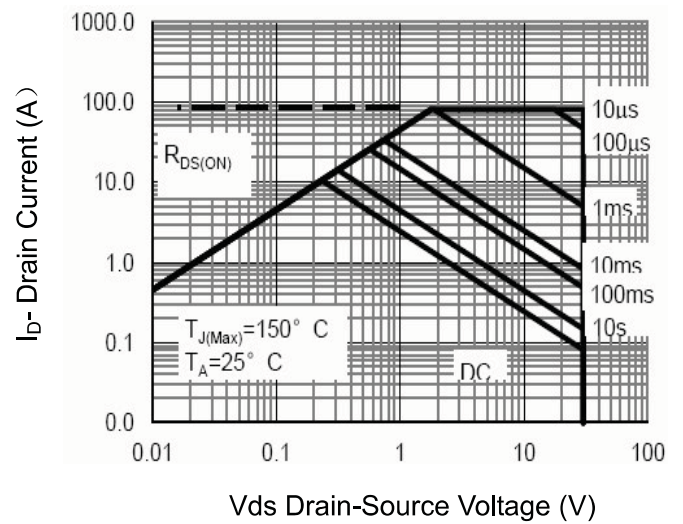


Figure 4 Safe Operation Area

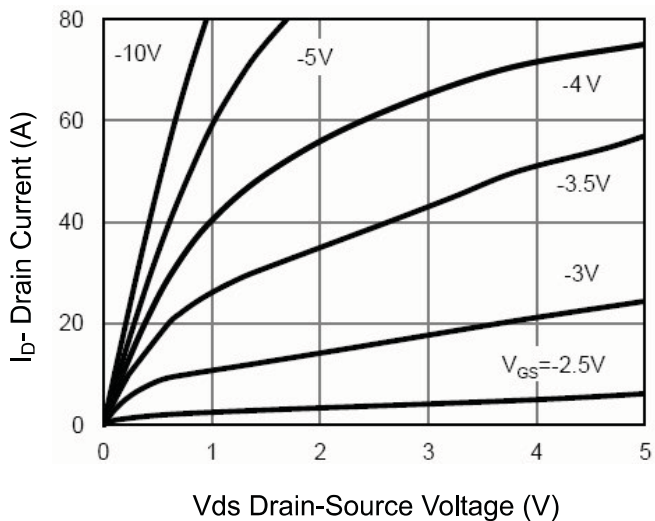


Figure 5 Output Characteristics

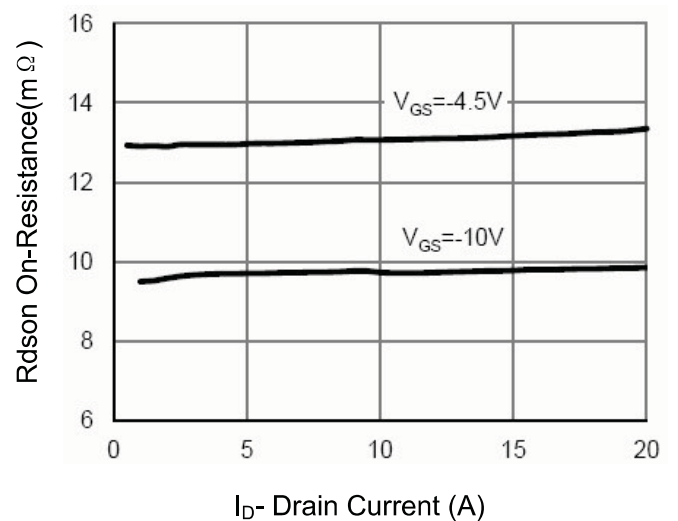
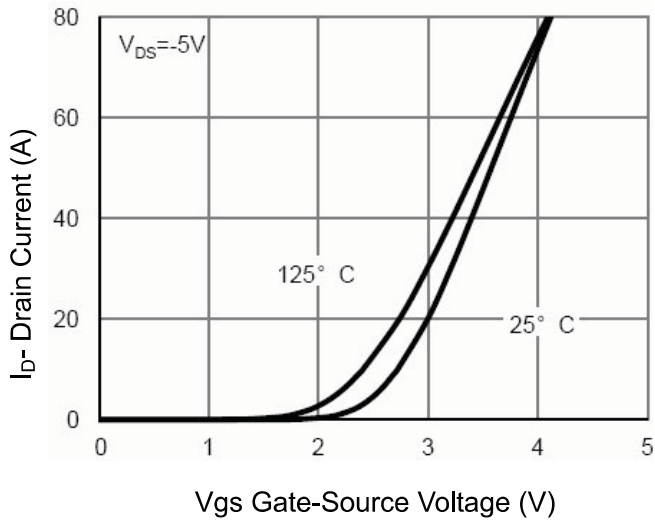
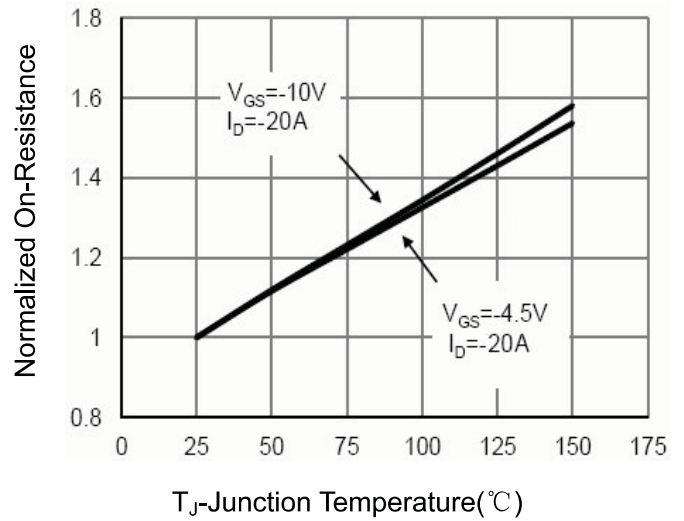


Figure 6 Drain-Source On-Resistance

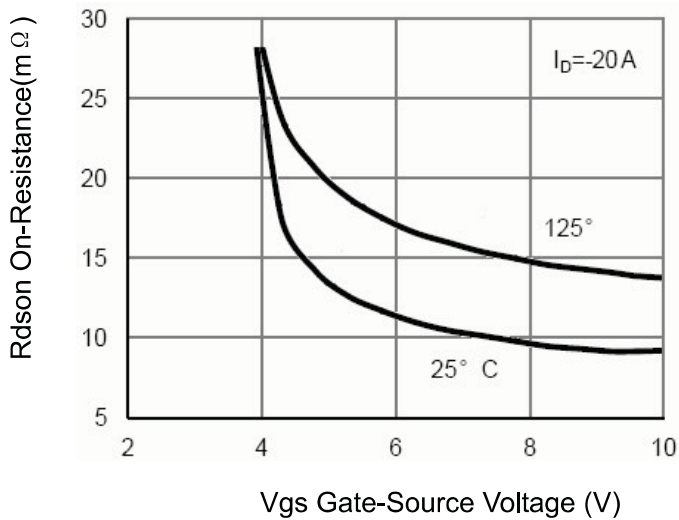
## RATING AND CHARACTERISTICS CURVES (RM30P30D3)



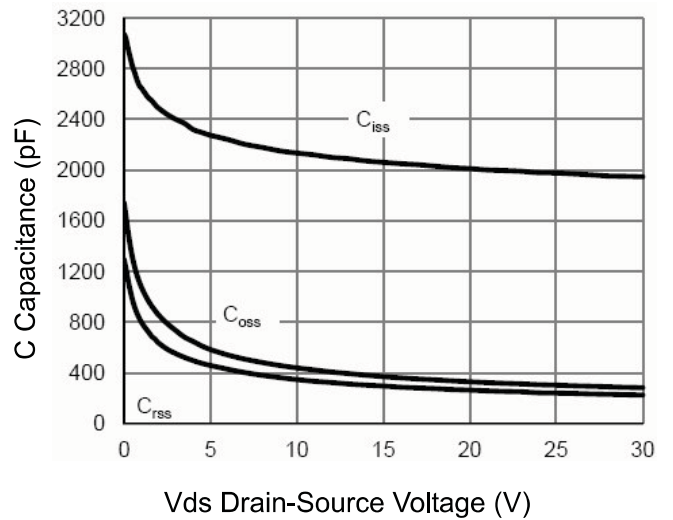
**Figure 7 Transfer Characteristics**



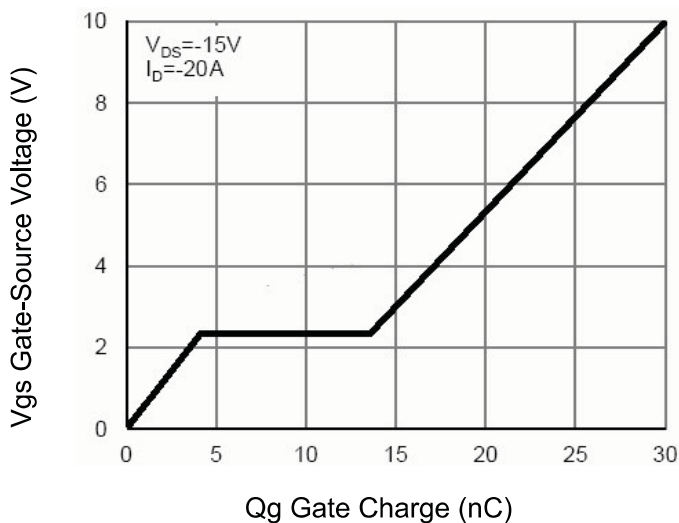
**Figure 8 Drain-Source On-Resistance**



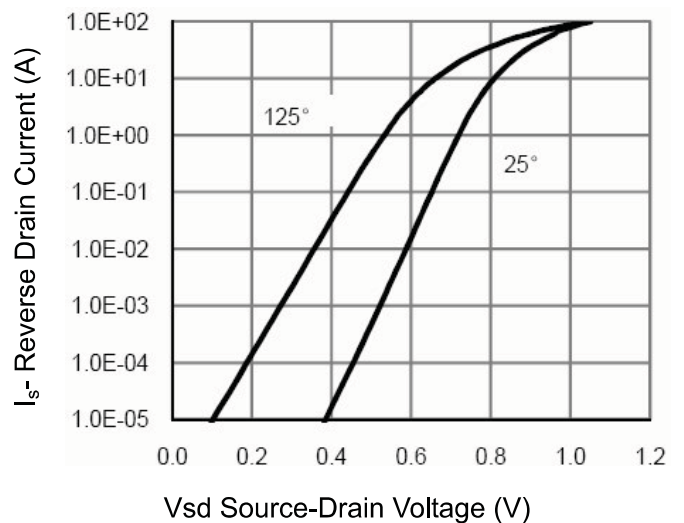
**Figure 9 Rds(on) vs Vgs**



**Figure 10 Capacitance vs Vds**

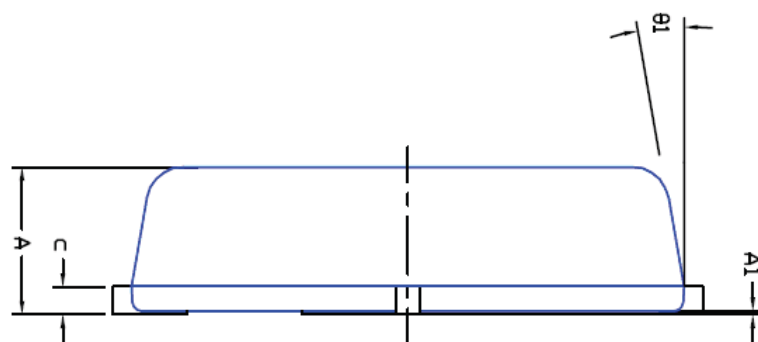
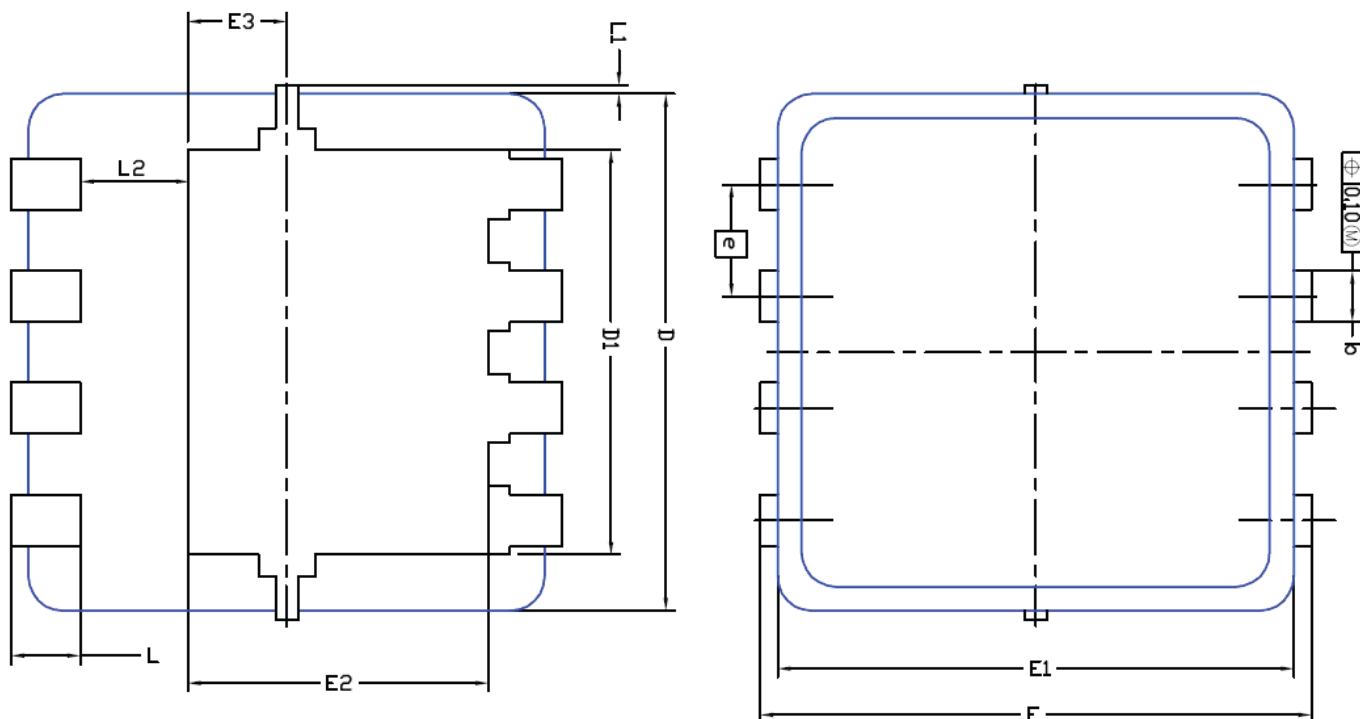


**Figure 11 Gate Charge**



**Figure 12 Source-Drain Diode Forward**

## DFN3X3 EP Package Information



DIM.	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.80	0.900	0.0276	0.0315	0.0354
A1	0.00	---	0.05	0.000	---	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.152	0.25	0.004	0.006	0.010
D	3.00 BSC			0.118 BSC		
D1	2.35 BSC			0.093 BSC		
E	3.20 BSC			0.126 BSC		
E1	3.00 BSC			0.118 BSC		
E2	1.75 BSC			0.069 BSC		
E3	0.575 BSC			0.023 BSC		
e	0.65 BSC			0.026 BSC		
L2	0.685 BSC			0.0274 BSC		
L	0.30	0.40	0.50	0.0118	0.0157	0.0197
L1	0	---	0.100	0	---	0.004
theta1	0°	10°	12°	0°	10°	12°

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