

P-Channel MOSFET

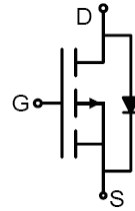
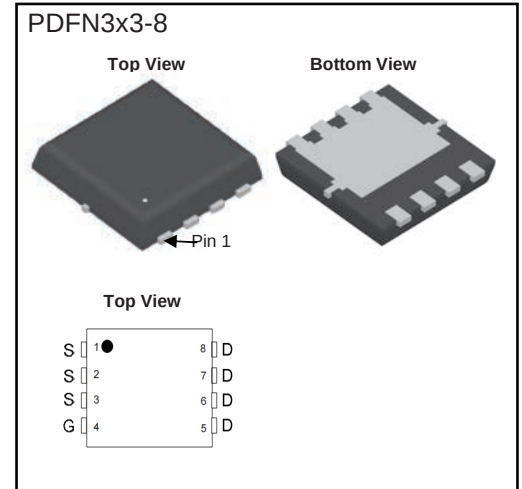
RC30P06D3

Features

- $V_{DS}(V) = -60V$
- $I_D = -30A$
- $R_{DS(ON)} = 25m\Omega$ (typ.) @ $V_{GS} = -10V$
- $R_{DS(ON)} = 32m\Omega$ (typ.) @ $V_{GS} = -4.5V$
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handing capability
- Lead free product is acquired

Application

- Load switch
- DC/DC converter for LCD display



Absolute Maximum Ratings ($T_c = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS} = 0V$)	-60	V
V_{GS}	Gate-Source Voltage ($V_{DS} = 0V$)	± 20	V
I_D	Drain Current-Continuous ($T_c = 25^\circ C$)	-30	A
	Drain Current-Continuous ($T_c = 100^\circ C$)	-17	A
I_{DM} (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-100	A
P_D	Maximum Power Dissipation ($T_c = 25^\circ C$)	33	W
	Maximum Power Dissipation ($T_c = 100^\circ C$)	13.5	W
E_{AS}	Avalanche energy (Note 2)	272	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$

Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		3.7	$^\circ C/W$

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■ Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-60V, V _{GS} =0V T _J =25℃			-1	μA
		V _{DS} =-60V, V _{GS} =0V T _J =125℃			-100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1		-2.5	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-10A		30.5		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-15A T _J =25℃		25	32	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-10A T _J =25℃		32	42	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-30V,V _{GS} =0V, f=1.0MHz		4026		pF
C _{oss}	Output Capacitance			134		pF
C _{rss}	Reverse Transfer Capacitance			98		pF
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-30V, R _L =2Ω, R _{GEN} =3Ω		12.2		nS
t _r	Turn-on Rise Time			10		nS
t _{d(off)}	Turn-Off Delay Time			64		nS
t _f	Turn-Off Fall Time			14		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-30V, I _D =-10A		68		nC
Q _{gs}	Gate-Source Charge			10.5		nC
Q _{gd}	Gate-Drain Charge			13		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-30	A
V _{SD}	Forward on Voltage ^(Note 3)	V _{GS} =0V, I _S =-10A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-10A, di/dt=100A/μs		26		ns
Q _{rr}	Reverse Recovery Charge	I _F =-10A, di/dt=100A/μs		29		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.EAS condition: T_J=25°C, V_{DD}=-40V, V_G=-10V, R_g=25Ω, L=0.5mH.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

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■ Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

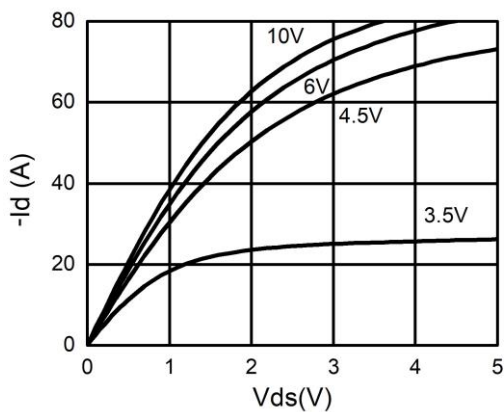


Figure 2. Transfer Characteristics

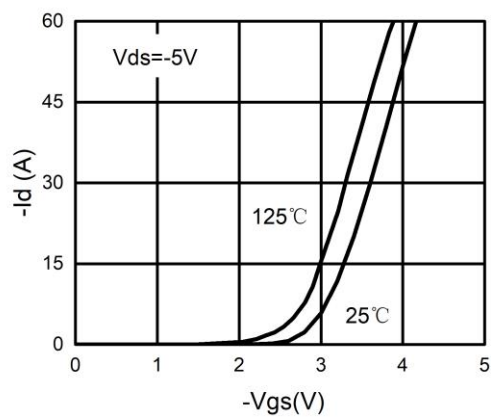


Figure 3. Power Dissipation

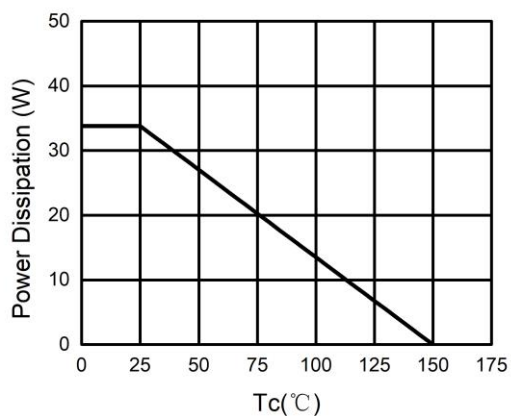


Figure 4. Drain Current

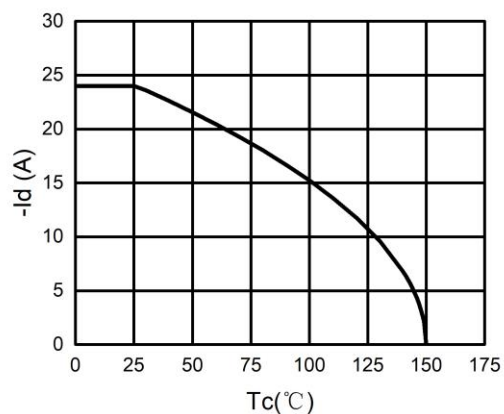


Figure 5. BV_{DSS} vs Junction Temperature

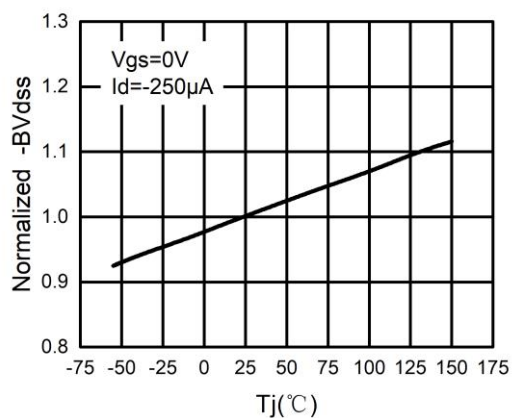
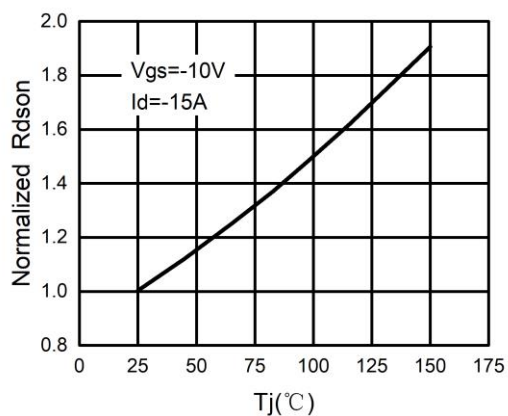


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



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■ Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

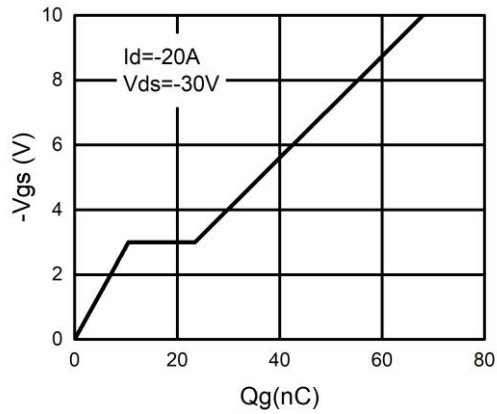


Figure 8. Capacitance

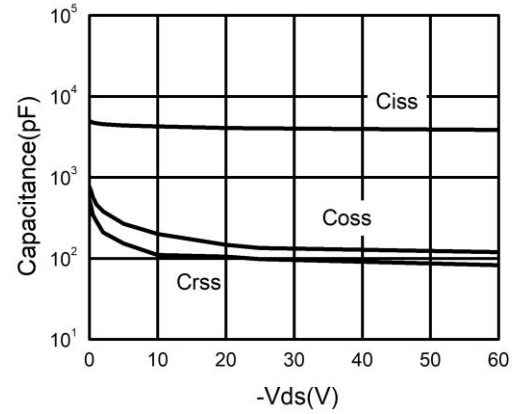


Figure 9. Body-Diode Characteristics

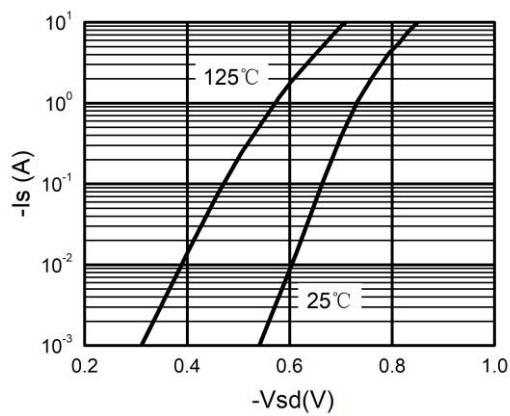
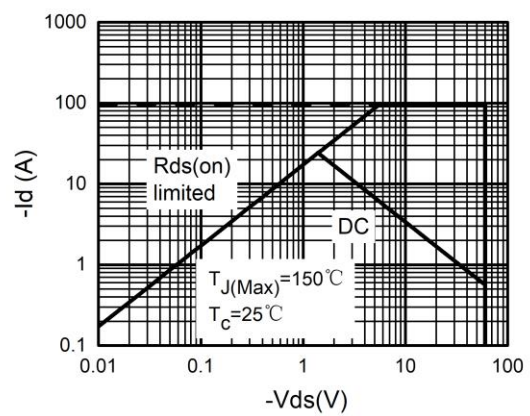


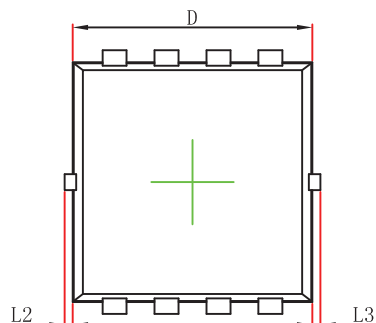
Figure 10. Maximum Safe Operating Area



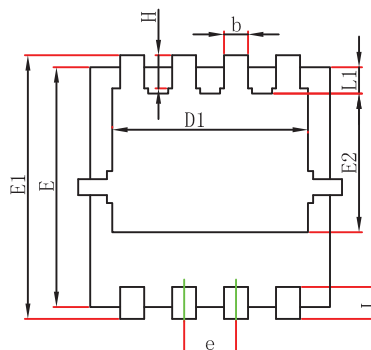
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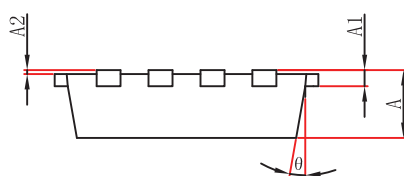
PDFN3x3-8 Package Outline Dimensions



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	3.050	3.250	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°