P-Channel Trench Power MOSFET

Lead Free Package and Finish

General Description

The RS30P65D uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -5V. This device is suitable for use as a wide variety of applications.

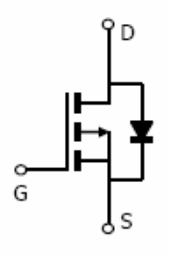
Features

- V_{DS} = -30V,ID =-65A
  $R_{DS(ON)}$ < 9mΩ @ V_{GS} =-10V
  $R_{DS(ON)}$ < 16mΩ @ V_{GS} =-5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- DC-DC converter
- Load switch
- Power management

100% UIS TESTED!
100% ΔVds TESTED!



Schematic Diagram

TO-252 top view

Package Marking and Ordering Information

Device Marking	Device	Device Package
RS30P65D	RS30P65D	TO-252

Table 1. Absolute Maximum Ratings (T_A=25℃)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	-30	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±25	V
I_D	Drain Current-Continuous(T_C=25℃)	-65	A
	Drain Current-Continuous(T_C=100℃)	-45	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed **(Note 1)**	-260	A
E_{AS}	Avalanche energy **(Note 2)**	500	mJ
P_D	Maximum Power Dissipation(T_C=25℃)	83	W
	Maximum Power Dissipation(T_C=100℃)	41	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	--	1.8	℃/W

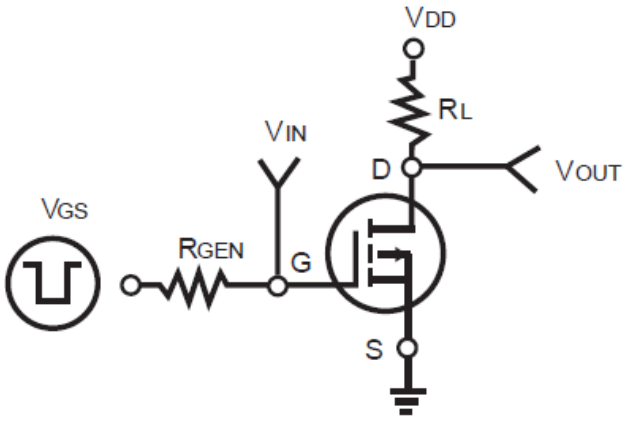
Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

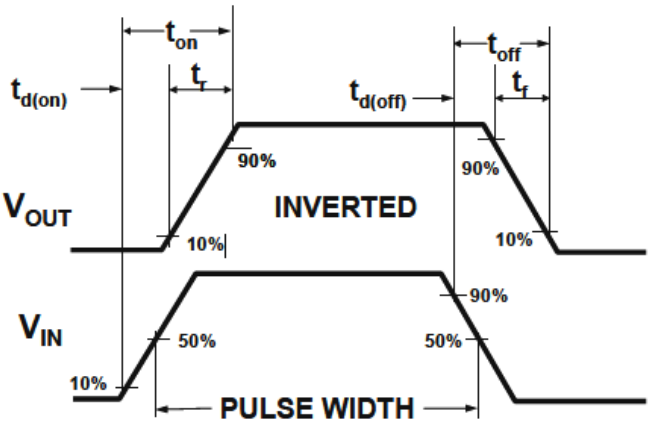
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±25V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1	-1.8	-3	V
g_{FS}	Forward Transconductance	V_{DS}=-5V,I_D=-10A	20	28		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-20A		7.1	9	mΩ
		V_{GS}=-5V, I_D=-15A		10	16	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, f=1.0MHz		3570		pF
C_{oss}	Output Capacitance			435		pF
C_{rss}	Reverse Transfer Capacitance			175		pF
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=-15V,I_D=-1A,R_L=15Ω V_{GS}=-10V,R_G=2.5Ω		16		nS
t_r	Turn-on Rise Time			14		nS
$t_{d(off)}$	Turn-Off Delay Time			50		nS
t_f	Turn-Off Fall Time			22		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-15V, I_D=-10A		58		nC
Q_{gs}	Gate-Source Charge			9		nC
Q_{gd}	Gate-Drain Charge			14		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)				-50	A
V_{SD}	Forward on Voltage	V_{GS}=0V,I_S=-10A			-1.2	V

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

Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=30V,V_G=-10V, R_G=25Ω

Switch Time Test Circuit and Switching Waveforms：





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

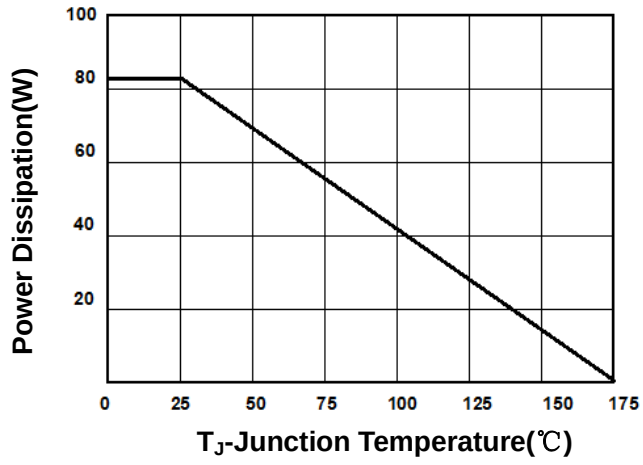


Figure2. Drain Current

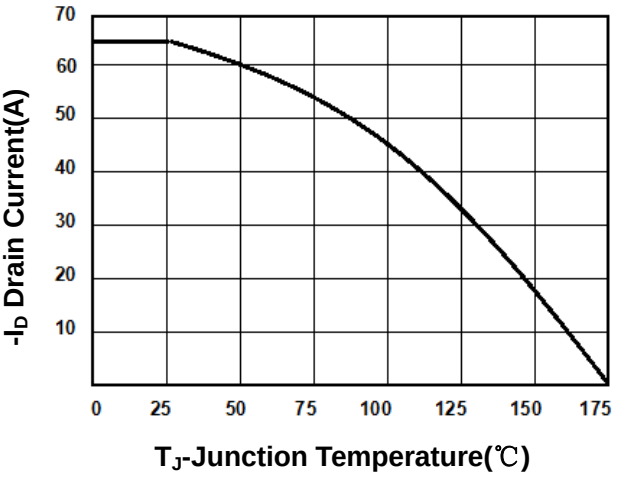


Figure3. Output Characteristics

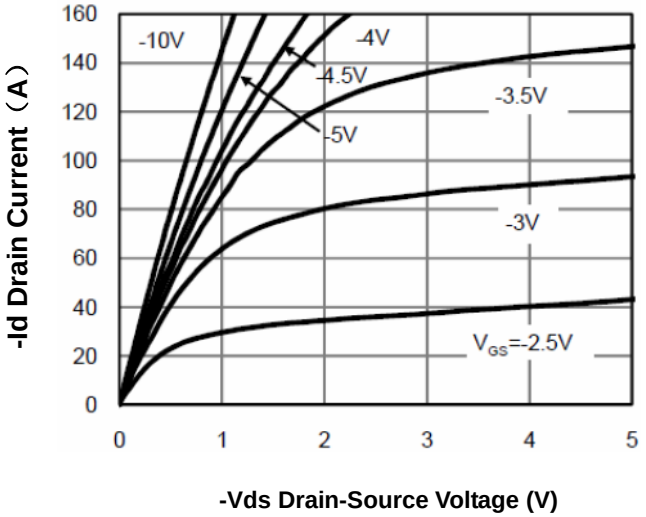


Figure4. Transfer Characteristics

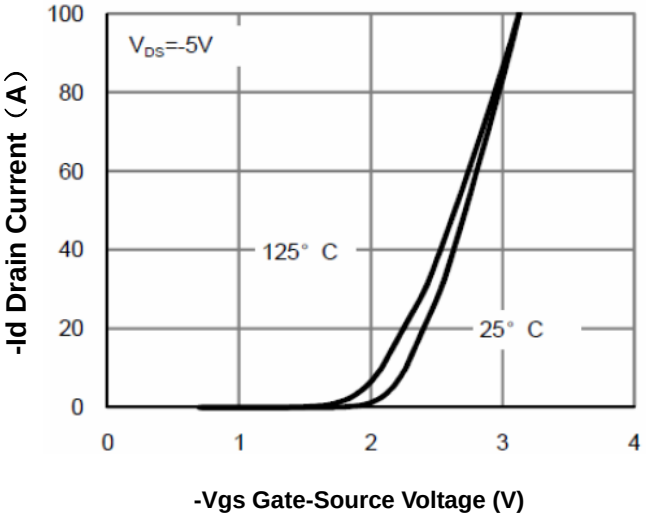


Figure5. Capacitance

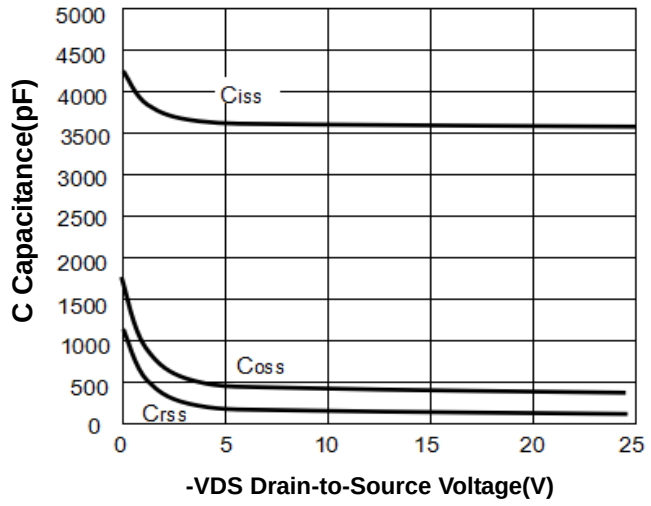


Figure6. $R_{DS(ON)}$ vs Junction Temperature

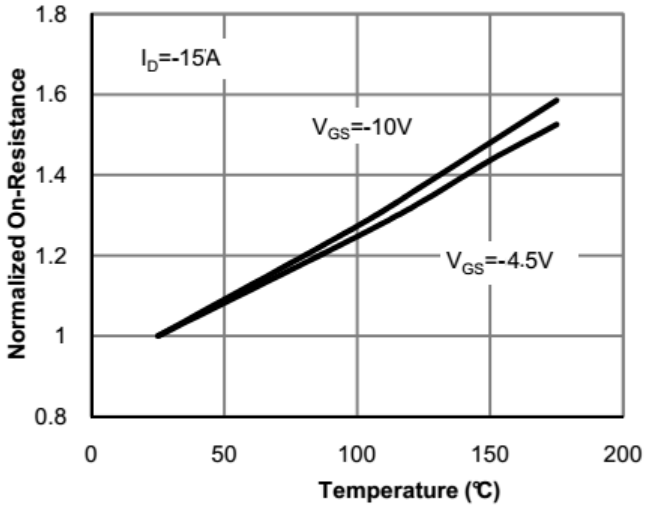


Figure7. Max BV_{DSS} vs Junction Temperature

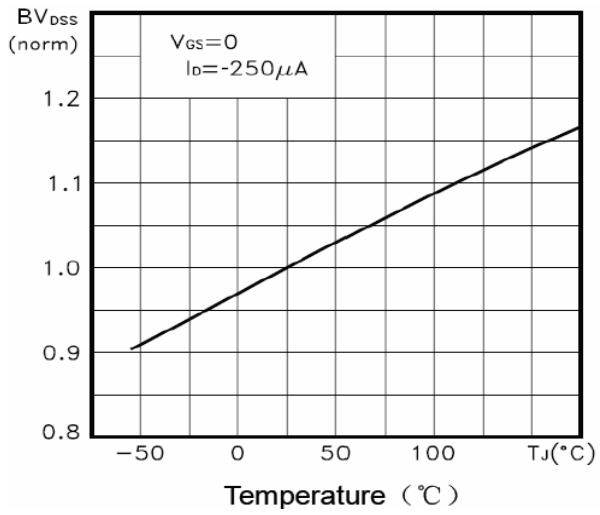


Figure8. $V_{GS(th)}$ vs Junction Temperature

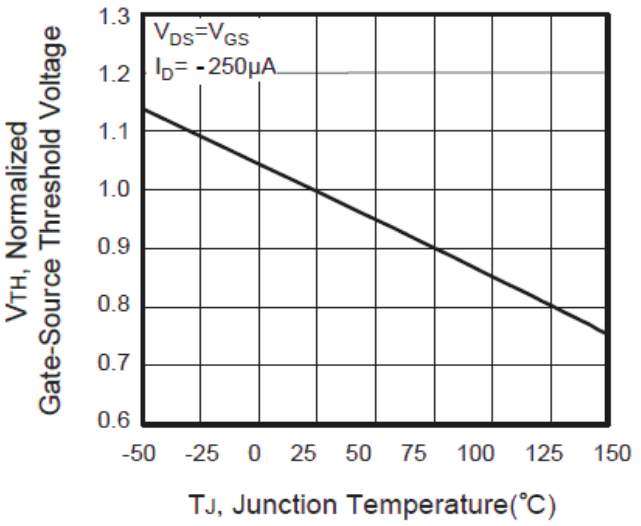


Figure9. Gate Charge Waveforms

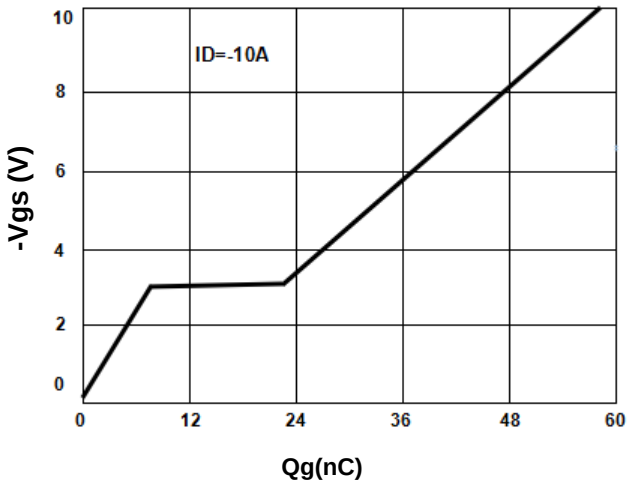


Figure10. Maximum Safe Operating Area

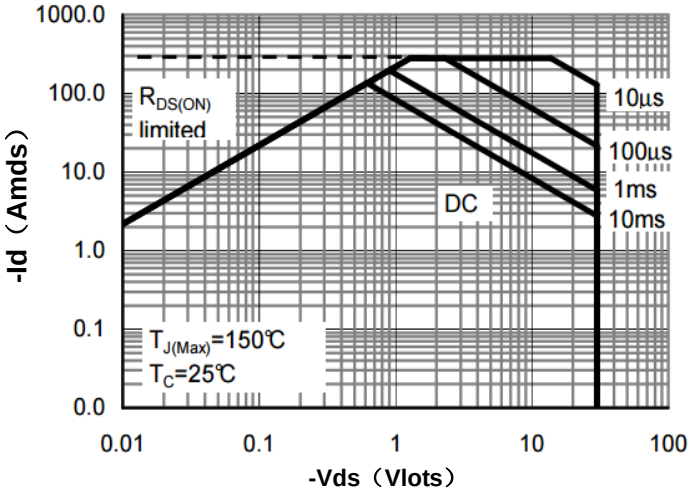
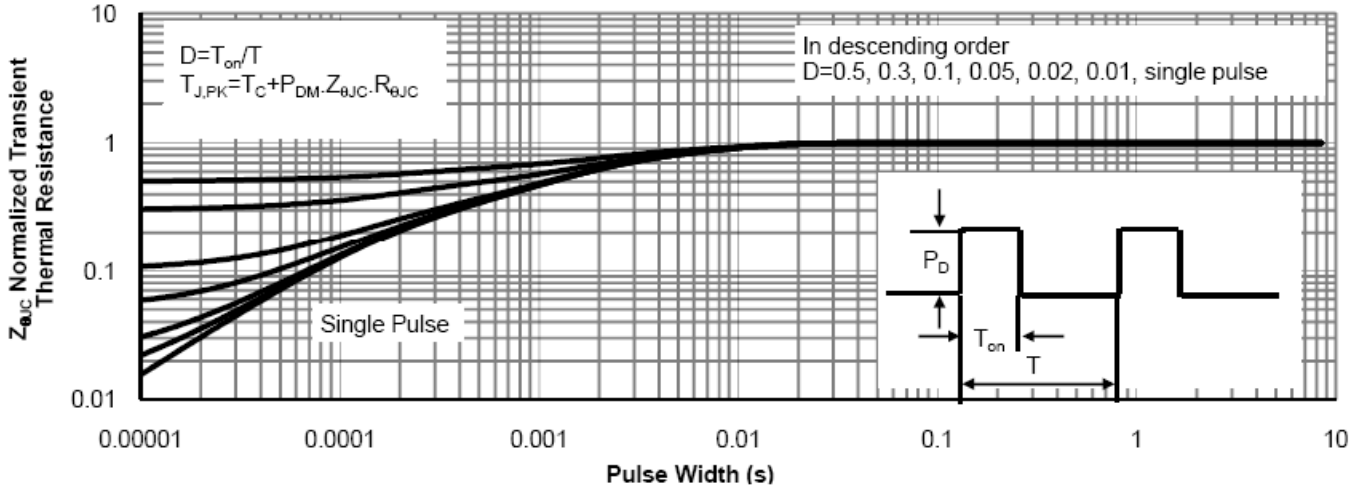
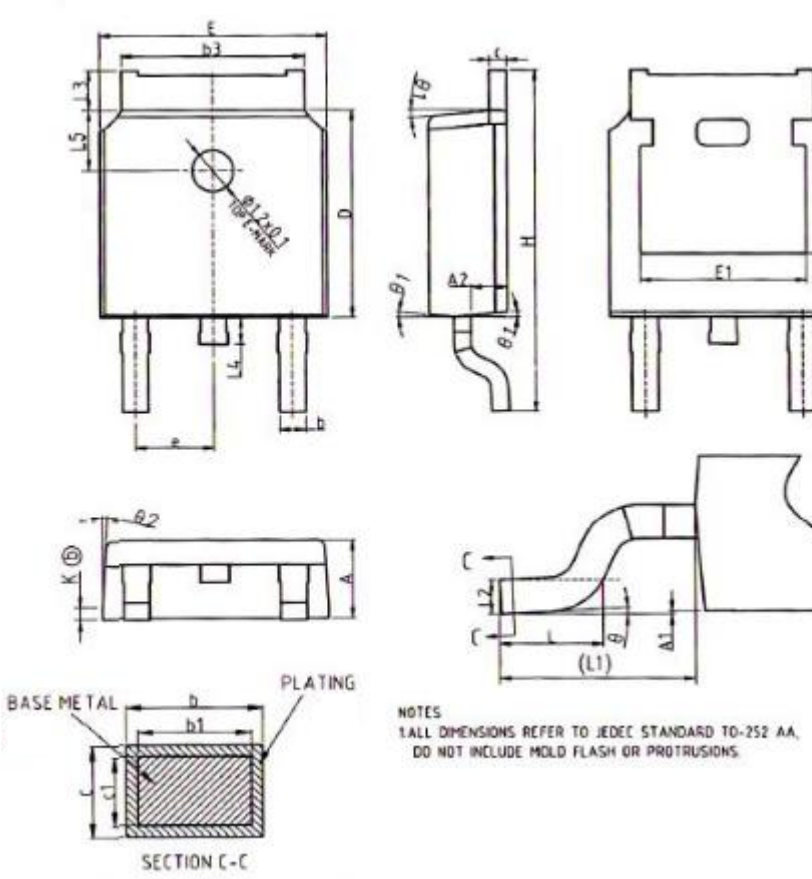


Figure11. Normalized Maximum Transient Thermal Impedance



TO-252 Package Information



COMMON DIMENSIONS			
SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.00	-	0.10
A2	0.97	1.07	1.17
b	0.72	0.78	0.85
b1	0.71	0.76	0.81
b3	5.23	5.33	5.46
c	0.47	0.53	0.58
c1	0.46	0.51	0.56
D	6.00	6.10	6.20
D1		5.30REF	
E	6.50	6.60	6.70
E1	4.70	4.83	4.92
e		2.286BSC	
H	9.90	10.10	10.30
L	1.40	1.50	1.70
L1		2.90REF	
L2		0.51BSC	
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	1.70	1.80	1.90
θ	0°	-	8°
θ1	5°	7°	9°
θ2	5°	7°	9°
K		0.40REF	

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