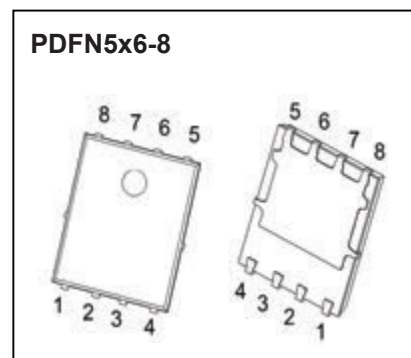


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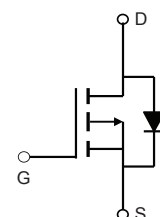
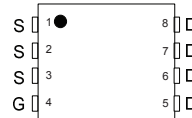
■ Features

- $V_{DS} = -30V$
- $I_D = -35A$
- $R_{DS(ON)} < 9.5m\Omega$ @ $V_{GS} = -10V$
- $R_{DS(ON)} < 14m\Omega$ @ $V_{GS} = -4.5V$
- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic
- Lead-Free, Halogen-Free; RoHS Compliant



■ Applications

- Notebook
- Load Switch
- Industrial DC/DC Conversion Circuits



■ Marking

Marking	**** RCQ5307
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■ Absolute Maximum Ratings

Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ^(Note2)	$T_C = 25^\circ C$	I_D	-35	A
	$T_C = 70^\circ C$		-28	A
Pulsed Drain Current		I_{DM}	-140	A
Avalanche Energy @ $L=0.5mH$		E_{AS}	140	mJ
Maximum Power Dissipation	$T_C = 25^\circ C$	P_D	37	W
	$T_C = 100^\circ C$		15	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient		$R_{\theta JA}$	73	$^\circ C / W$
Thermal Resistance Junction-Case		$R_{\theta JC}$	3.4	$^\circ C / W$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D = -250uA	-30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V , V _{GS} =0V			-1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =-250uA	-1.0	-1.6	-2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V , I _D =-10A		7.4	9.5	mΩ
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-4.5V , I _D =-8A		10.5	14	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-15V , I _D =-5A		15		S
DYNAMIC CHARACTERISTICS ^{Note4}						
Input Capacitance	C _{ISS}	V _{DS} =-15V , V _{GS} =0 V , f =1.0MHz		1450		pF
Output Capacitance	C _{OSS}			250		pF
Reverse Transfer Capacitance	C _{RSS}			230		pF
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V, f=1MHz		13		Ω
Total Gate Charge	Q _g	V _{DS} =-15V , I _D =-10A , V _{GS} =-10V		48		nC
Gate-Source Charge	Q _{gs}			7.8		nC
Gate-Drain Charge	Q _{gd}			12		nC
SWITCHING CHARACTERISTICS ^{Note4}						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =-15V , I _D =-10A , V _{GS} =-10V , R _{GEN} =6Ω		13.5		ns
Rise Time	tr			20		ns
Turn-Off Delay Time	t _{D(OFF)}			69		ns
Fall Time	tf			15		ns
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =-10A			-1.2	V

Notes:

- 1、Pulse Test Width < 300us,Duty Cycle< 2%
- 2、Drain current limited by maximum junction temperature.
- 3、Starting T_j=25°C ,L=0.5mH,V_{DD}=-15V,V_{GS}=-10V ,R_G=25Ω
- 4、Guaranteed by design,not subject to production testing.

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Typical Performance Characteristics

Fig.1 Continuous Drain Current vs. T_C

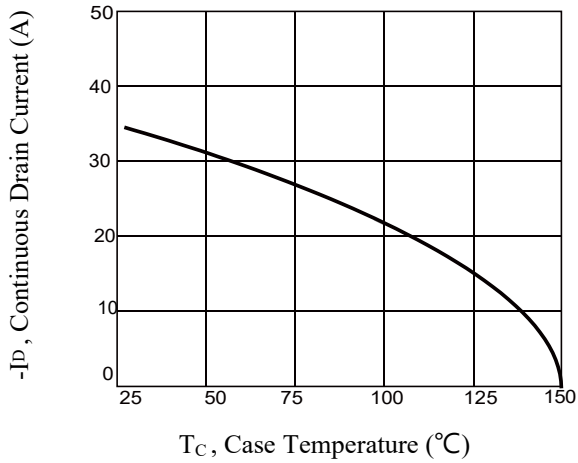


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

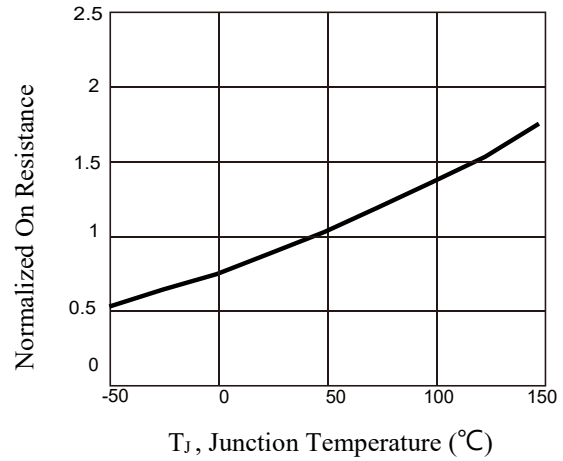


Fig.3 Normalized V_{th} vs. T_J

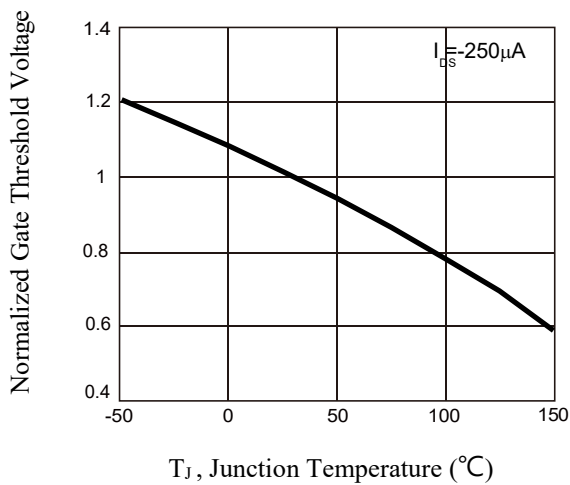


Fig.4 Gate Charge Waveform

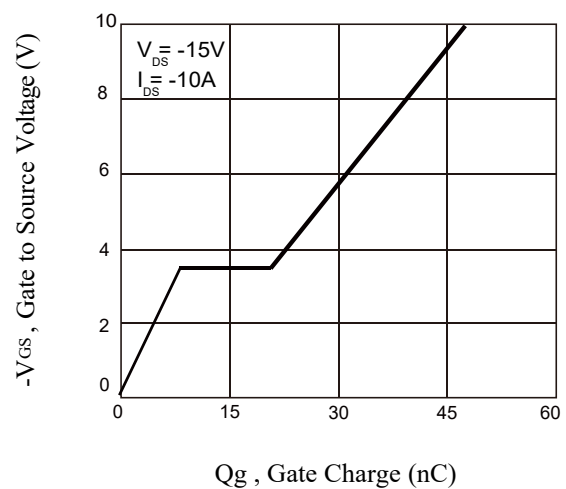


Fig.5 Typical Output Characteristics

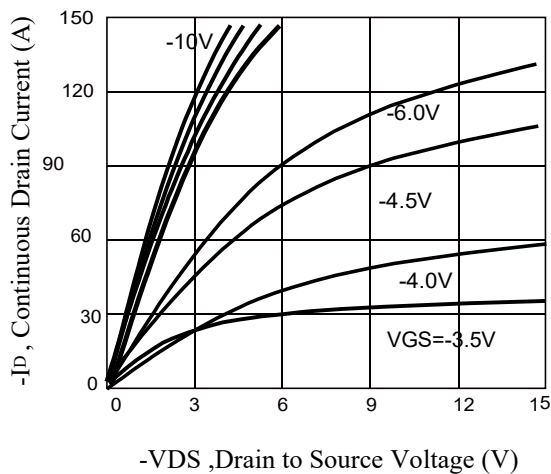
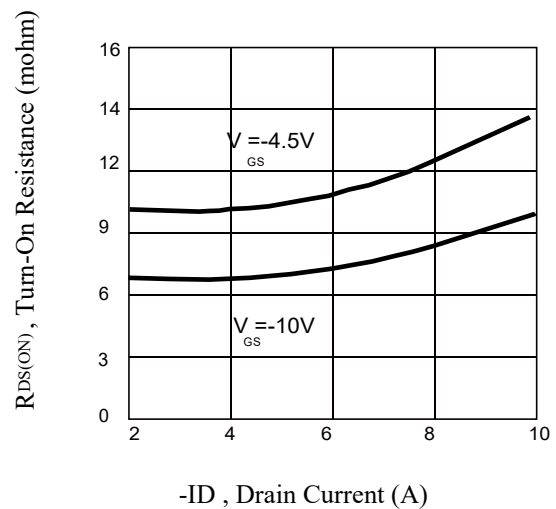


Fig.6 Turn-On Resistance vs. I_D



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Fig.7 Capacitance

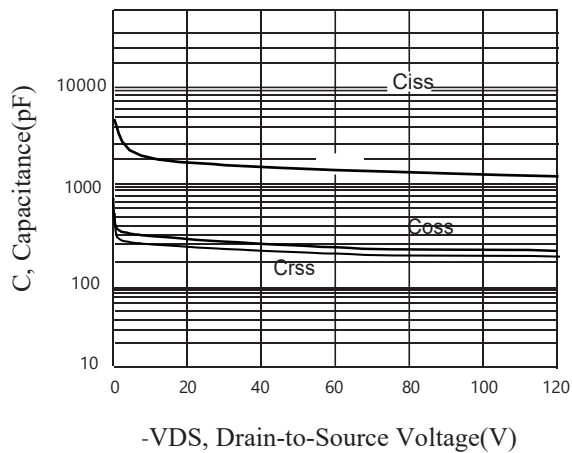


Fig.8 Typical Source-Drain Diode Forward Voltage

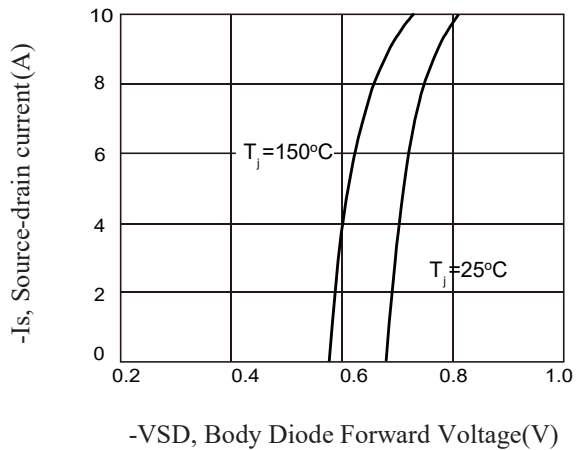


Fig.9 Normalized Transient Impedance

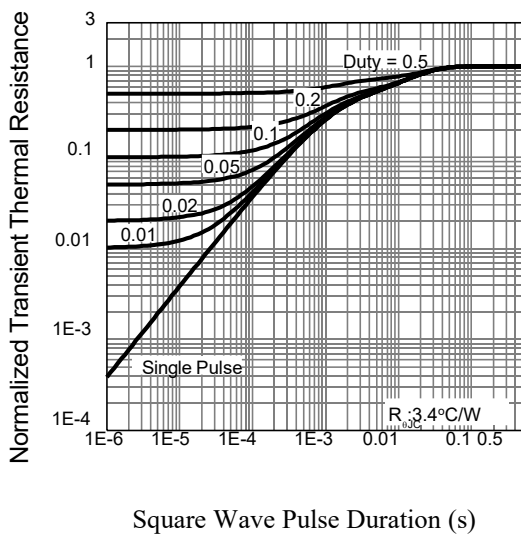
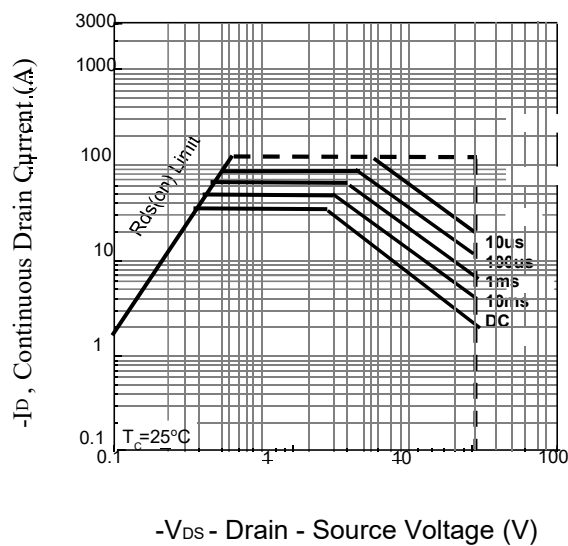


Fig.10 Maximum Safe Operation Area



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Figure11b. Switching Test Circuit

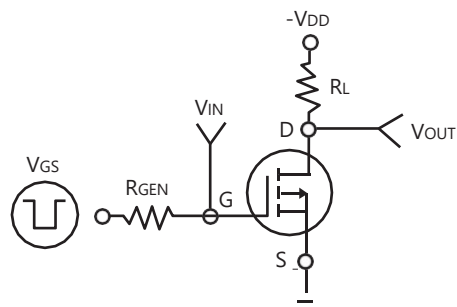


Figure11b. Switching Waveforms

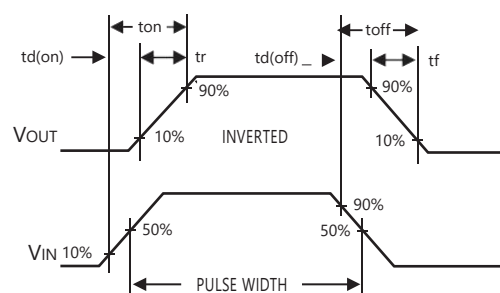


Figure 12a.Unclamped Inductive Test Circuit

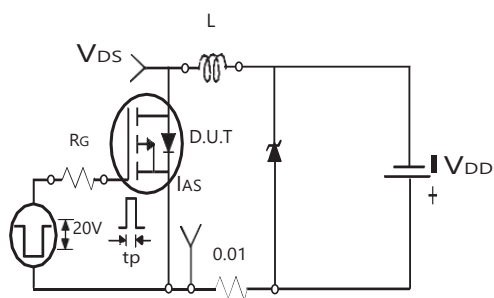
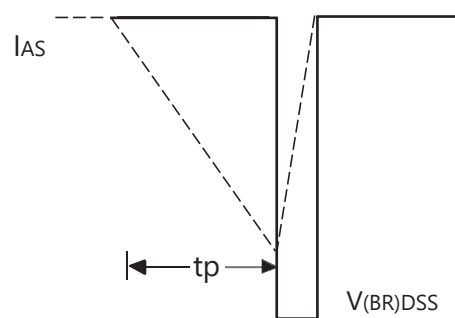


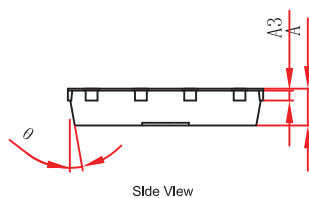
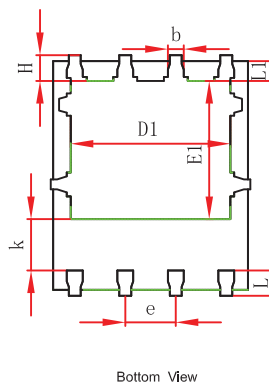
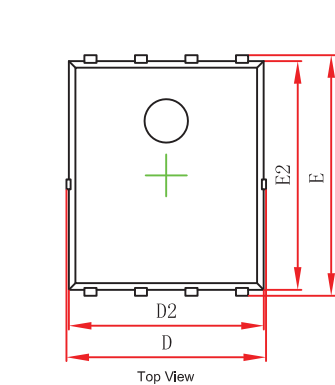
Figure 12b.Unclamped Inductive Waveform



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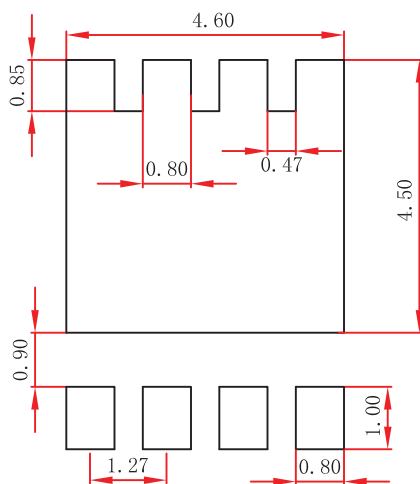
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■ PDFN5x6-8 Package Outline Dimensions



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

■ PDFN5x6-8 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.