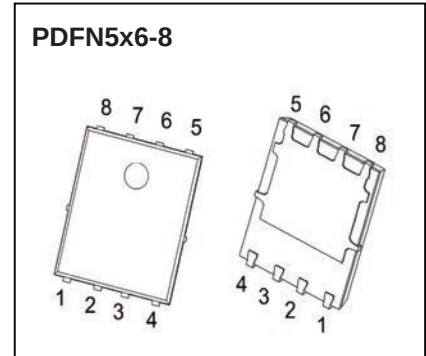
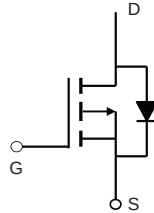


30V P-Channel MOSFETs

RCQ5305

■ Features

- $V_{DS} (V) = -30 V$
- $I_D = -90 A$
- $R_{DS(ON)} (at V_{GS} = -10 V) < 6.5 m\Omega$
- $R_{DS(ON)} (at V_{GS} = -4.5 V) < 8.0 m\Omega$



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_c=25^\circ C$)	-90	A
	Drain Current – Continuous ($T_c=100^\circ C$)	-56	A
I_{DM}	Drain Current – Pulsed ¹	-360	A
P_D	Power Dissipation ($T_c=25^\circ C$)	136	W
	Power Dissipation – Derate above $25^\circ C$	1.08	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

■ Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	0.92	$^\circ C/W$

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■ Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.03	---	$\text{V}/^{\circ}\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-30V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
		$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V$, $I_D=-30A$	---	5	6.5	$\text{m}\Omega$
		$V_{GS}=-4.5V$, $I_D=-20A$	---	6	8	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.2	-1.6	-2.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$\text{mV}/^{\circ}\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=-10V$, $I_D=-5A$	---	25	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=-15V$, $V_{GS}=-10V$, $I_D=-10A$	---	108	150	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	15	25	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	17.4	30	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=-15V$, $V_{GS}=-10V$, $R_G=6\Omega$ $I_D=-1A$	---	28	56	ns
T_r	Rise Time ^{2, 3}		---	16	32	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	178	340	
T_f	Fall Time ^{2, 3}		---	72	140	
C_{iss}	Input Capacitance	$V_{DS}=-25V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	6220	9000	pF
C_{oss}	Output Capacitance		---	782	1100	
C_{rss}	Reverse Transfer Capacitance		---	412	600	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-90	A
I_{SM}	Pulsed Source Current		---	---	-180	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^{\circ}\text{C}$	---	---	-1	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V$, $I_S=-30A$, $di/dt=100A/\mu s$	---	63.8	---	ns
Q_{rr}	Reverse Recovery Charge	$T_J=25^{\circ}\text{C}$	---	62.3	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

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Typical Performance Characteristics

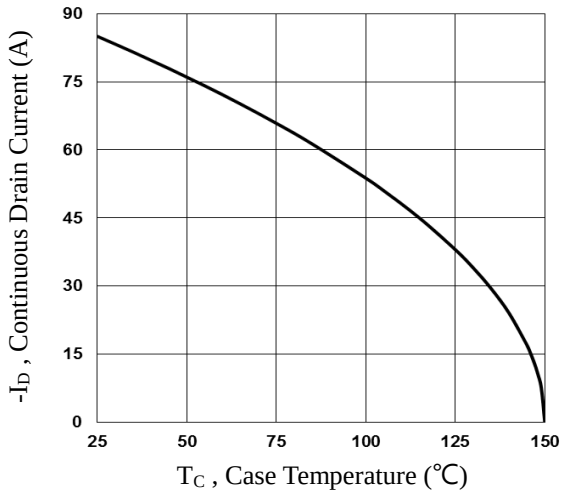


Fig.1 Continuous Drain Current vs. T_C

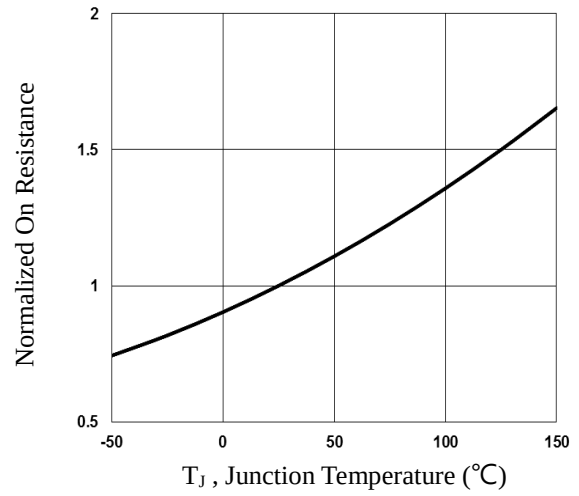


Fig.2 Normalized RSDON vs. T_J

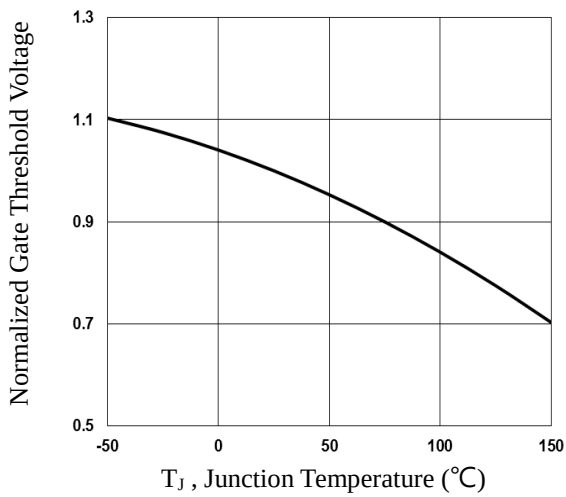


Fig.3 Normalized V_{th} vs. T_J

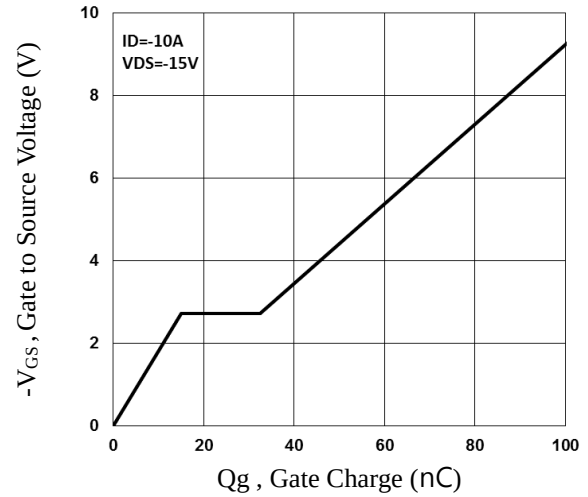


Fig.4 Gate Charge Waveform

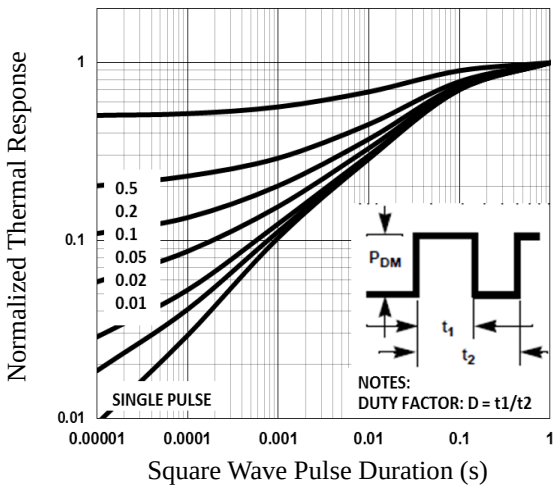


Fig.5 Normalized Transient Impedance

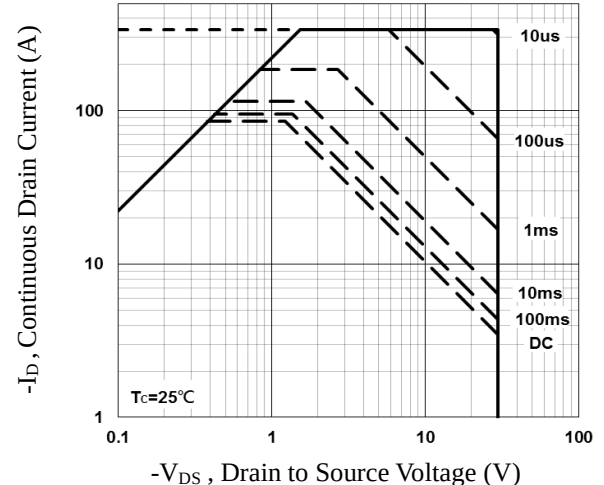


Fig.6 Maximum Safe Operation Area

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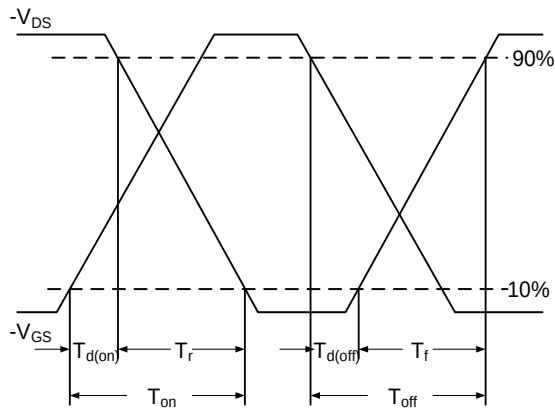


Fig.7 Switching Time Waveform

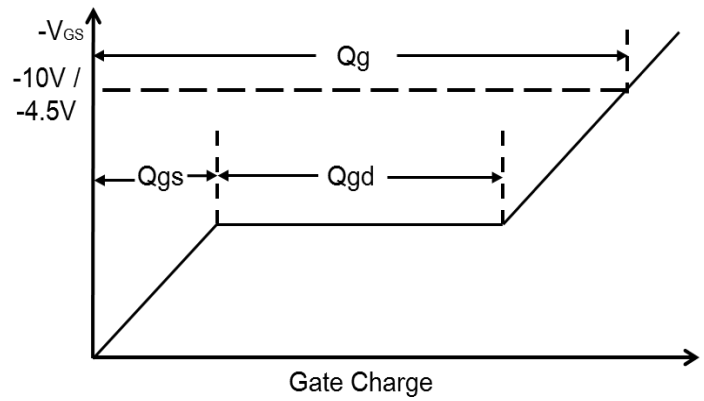
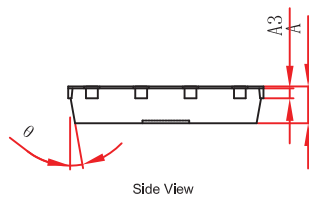
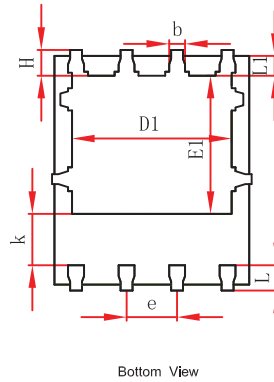
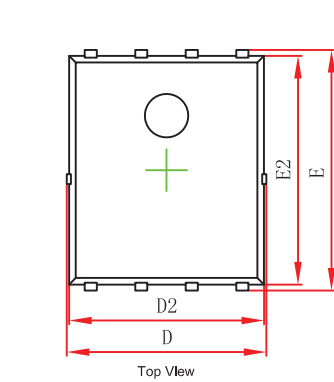


Fig.8 Gate Charge Waveform

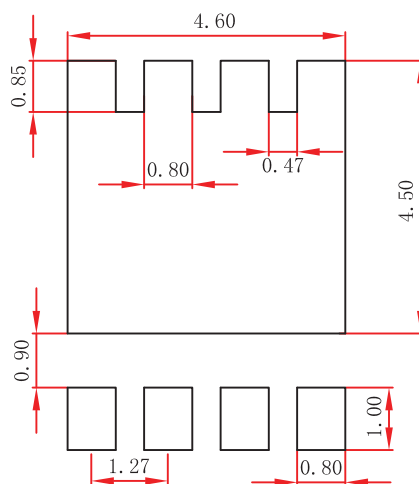
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■ PDFN5x6-8 Package Outline Dimensions



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.