

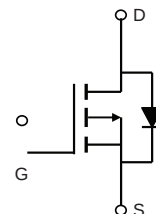
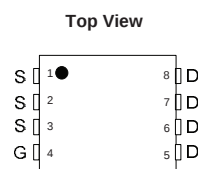
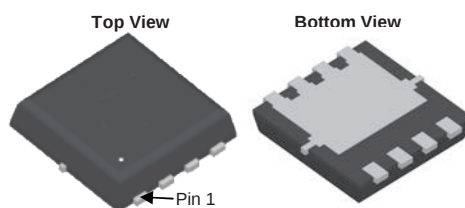
P-Channel MOSFET

RCQ3635

■ Features

- V_{DS} -30 V
- I_D -35 A
- $R_{DS(ON)}$ (at $V_{GS} = -10V$) < 15m Ω
- $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) < 25m Ω

PDFN3x3-8



■ Absolute Maximum Ratings $T_C=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	-35	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	-19	A
I_{DM}	Drain Current – Pulsed ¹	-120	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	23	W
	Power Dissipation – Derate above 25°C	0.18	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

■ Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	5.4	$^\circ\text{C}/\text{W}$

P-Channel MOSFET

RCQ3635

■ 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 , $I_D=-1mA$	---	-0.03	---	$V/^{\circ}\text{C}$
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	$V_{GS}=-10V$, $I_D=-8A$	---	10	15	$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-6A$	---	15	25	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4	---	$mV/^{\circ}\text{C}$
gfs	Forward Transconductance	$V_{DS}=-10V$, $I_D=-8A$	---	10.5	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-15V$, $V_{GS}=-4.5V$, $I_D=-8A$	---	14.6	21	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	4.1	6	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	6.3	9	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-15V$, $V_{GS}=-10V$, $R_G=6\Omega$ $I_D=-1A$	---	9	17	ns
T_r	Rise Time ^{2,3}		---	21.8	41	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	59.8	114	
T_f	Fall Time ^{2,3}		---	14.4	27	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, $F=1MHz$	---	1730	2510	pF
C_{oss}	Output Capacitance		---	180	260	
C_{rss}	Reverse Transfer Capacitance		---	125	180	

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	---	---	-30	A
I_{SM}	Pulsed Source Current		---	---	-120	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^{\circ}\text{C}$	---	---	-1	V

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.

P-Channel MOSFET RCQ3635

■ Typical Performance Characteristics

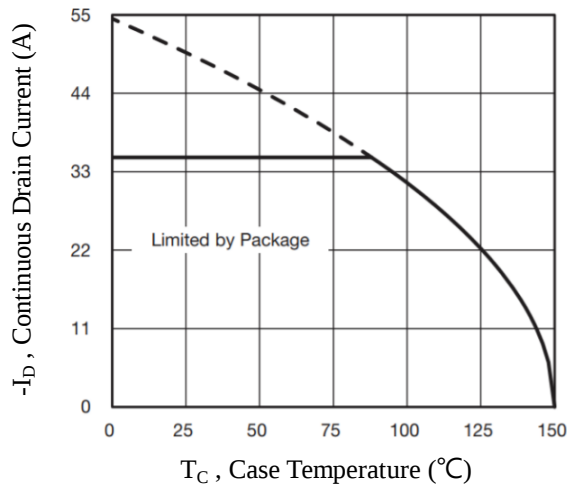


Fig.1 Continuous Drain Current vs. T_C

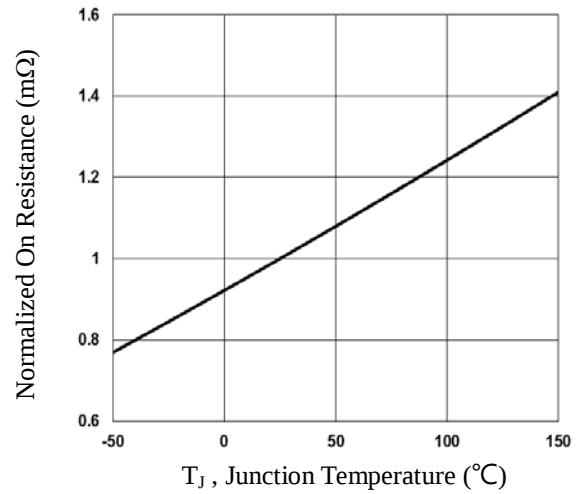


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

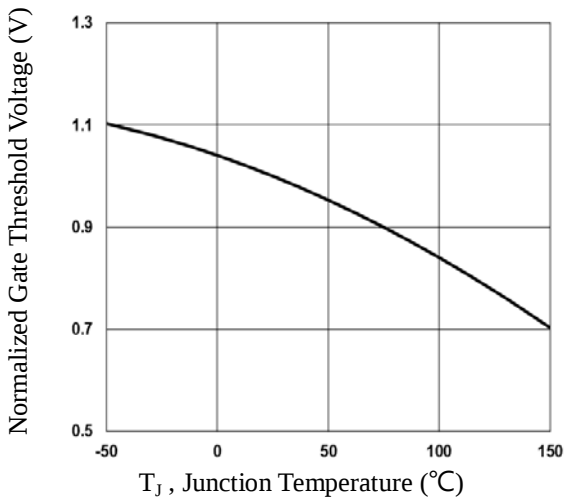


Fig.3 Normalized V_{th} vs. T_J

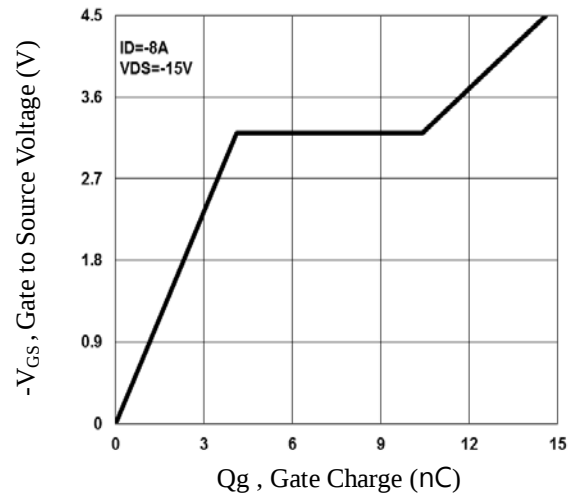


Fig.4 Gate Charge Waveform

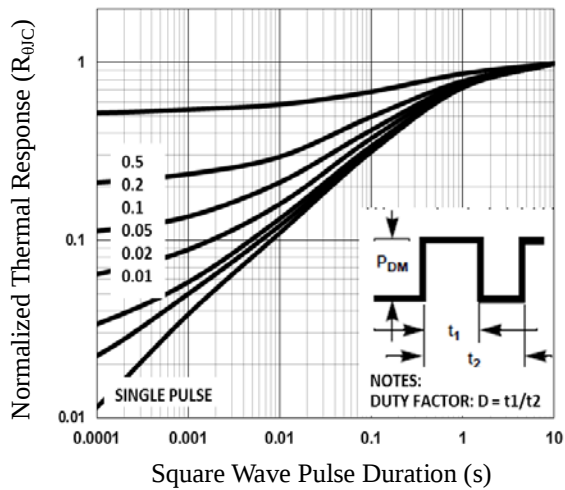


Fig.5 Normalized Transient Impedance

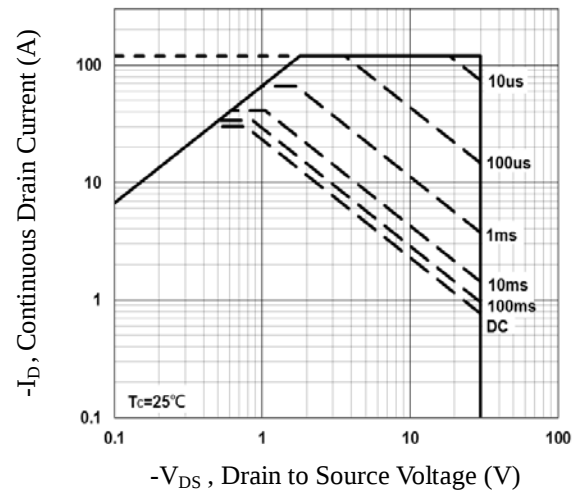


Fig.6 Maximum Safe Operation Area

P-Channel MOSFET RCQ3635

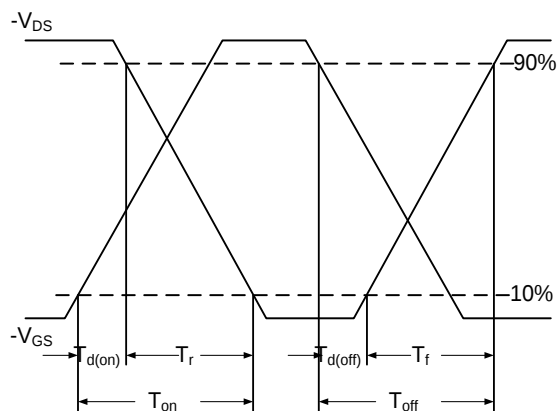


Fig.7 Switching Time Waveform

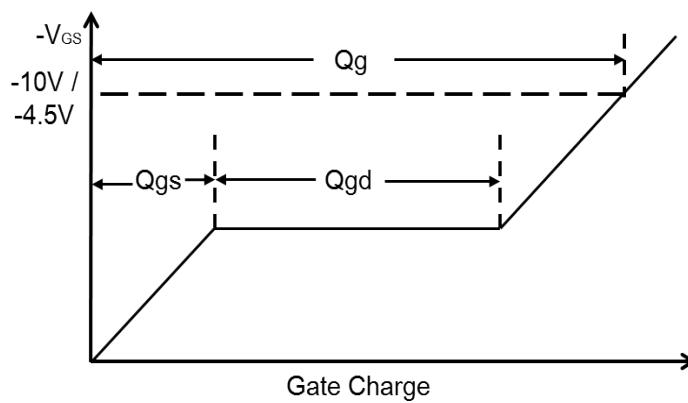
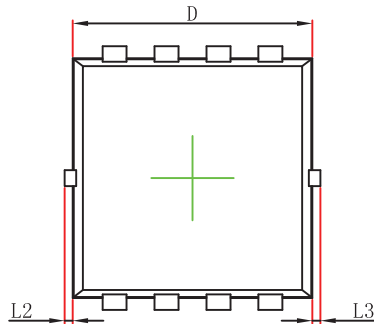


Fig.8 Gate Charge Waveform

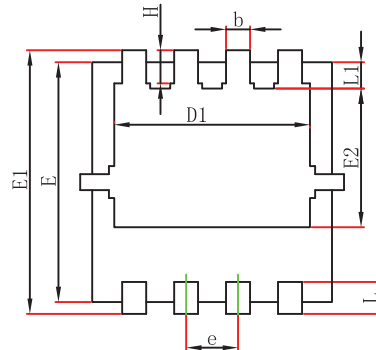
P-Channel MOSFET

RCQ3635

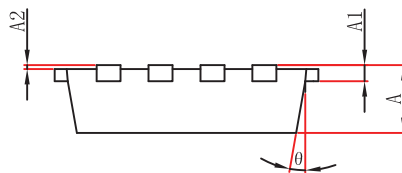
■ PDFN3x3-8 Package Outline Dimensions



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°