HCNR4435A

30V P-Channel MOSFET

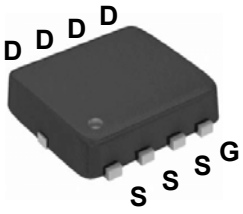
General Description

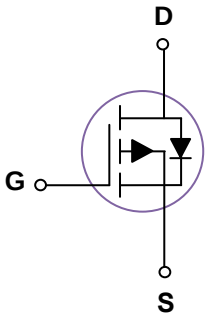
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

V_{DS}	-30V
I_D (at V_{GS}=-10V)	-30A
$R_{DS(ON)}$ (at V_{GS}=-10V)	15mΩ(Typ)
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	19mΩ(Typ)

PDFN3*3





Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	TC=25°C	I_D	-30	A
	TC=100°C	I_D	-19	A
Drain Current – Pulsed		I_{DM}	-120	A
Maximum Power Dissipation		P_D	23	W
Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		1.1	℃ /W
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		60	℃ /W

Electrical Characteristics (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
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}=±20V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1.0	-1.5	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-8.0A		15	20	mΩ
		V_{GS}=-4.5V, I_D=-5.0A		19	25	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz		1630		pF
C_{oss}	Output Capacitance			180		pF
C_{rss}	Reverse Transfer Capacitance			125		pF
SWITCHING PARAMETERS						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-15V,I_D=-1A, V_{GS}=-10V, R_G=6Ω		9		nS
t_r	Turn-on Rise Time			21		nS
$t_{d(off)}$	Turn-Off Delay Time			59		nS
t_f	Turn-Off Fall Time			14		nS
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-8A, V_{GS}=-4.5V		14		nC
Q_{gs}	Gate-Source Charge			4.1		nC
Q_{gd}	Gate-Drain Charge			6.3		nC
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_{SD}=-1A		0.72	1.4	V

Note：

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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

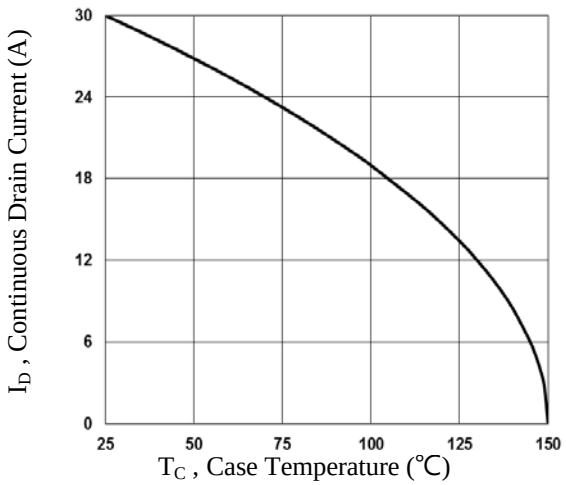


Fig.1 Continuous Drain Current vs. T_C

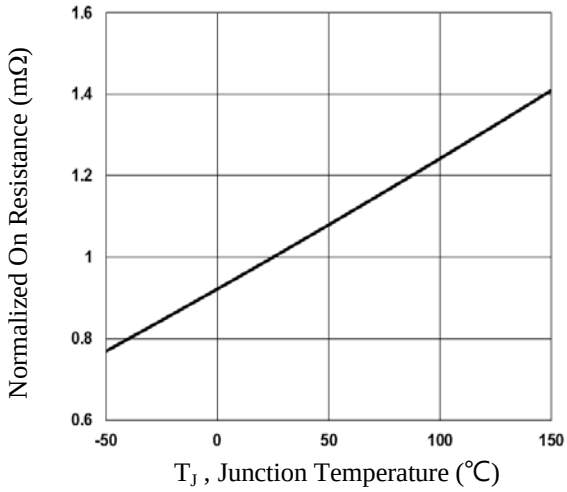


Fig.2 Normalized RDSON vs. T_J

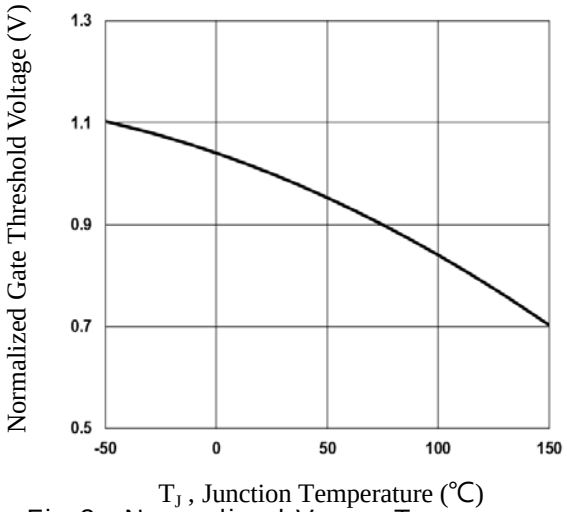


Fig.3 Normalized V_{th} vs. T_J

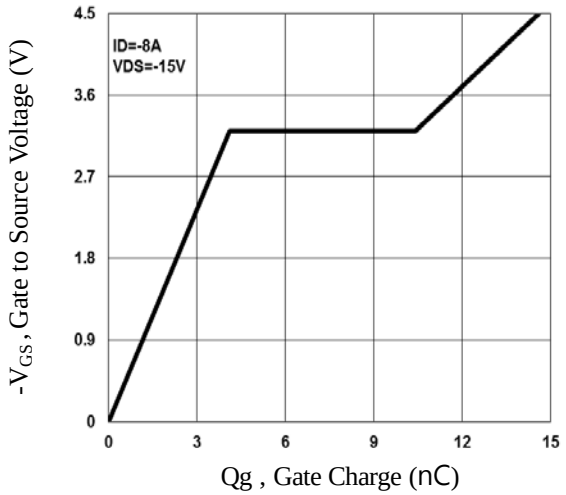


Fig.4 Gate Charge Waveform

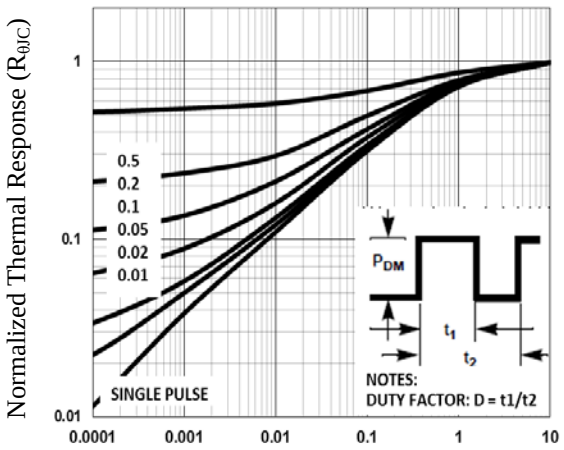


Fig.5 Normalized Transient Impedance

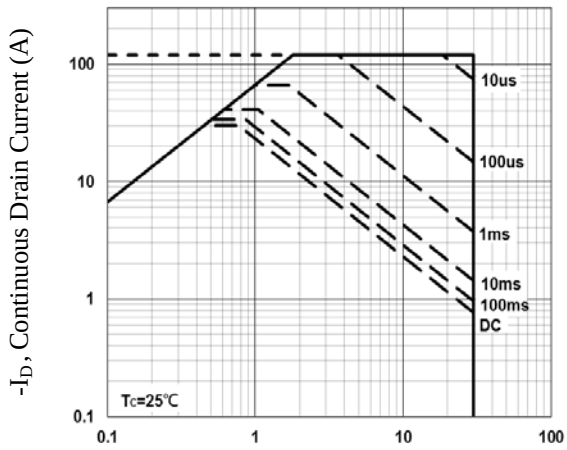


Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

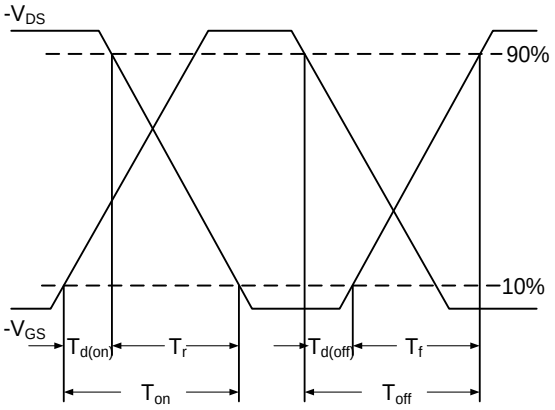


Fig.7 Switching Time Waveform

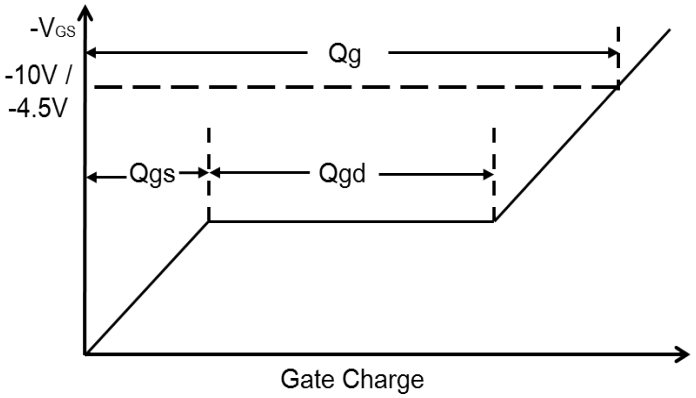
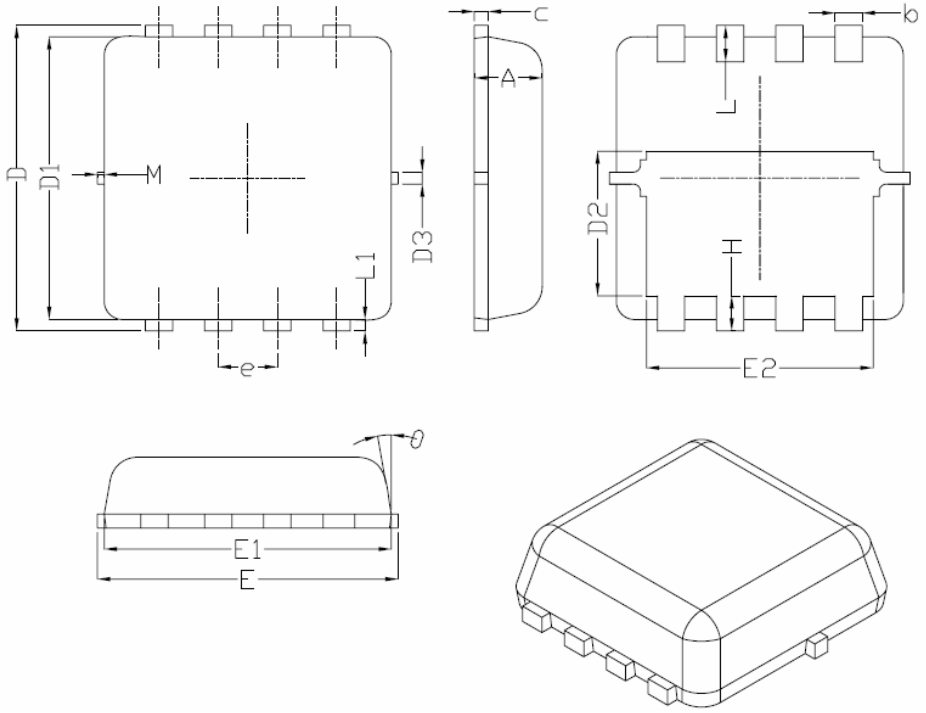


Fig.8 Gate Charge Waveform

PDFN3*3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BS		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°