PECJ4407A

Description

PECJ P-channel Enhancement Mode Power MOSFET

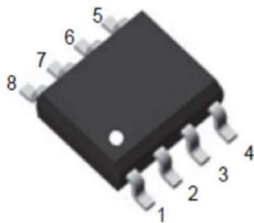#### Features

- V_{DS}= -30V, I_D= -12A

  $R_{DS(ON)}$ <14mΩ @ V_{GS} = -10V

  $R_{DS(ON)}$ <20mΩ @ V_{GS} = -4.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
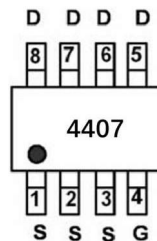- Lead free product is acquired

Application

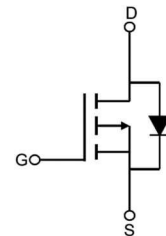- PWM Applications
- Load Switch
- Power Management

100% UIS TESTED!
100% ΔVds TESTED!

RoHS

SOP-8 top view

Marking and pin Assignment

Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
4407	PECJ4407A	TAPING	SOP-8	13inch	4000	48000

Absolute Maximum Ratings (T_A=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25℃	-12	A
		T_A = 100℃	-7.8	A
I_{DM}	Pulsed Drain Current [note1]		-48	A
E_{AS}	Single Pulsed Avalanche Energy [note2]		64	mJ
P_D	Power Dissipation	T_A = 25℃	3	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		41.7	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

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Electrical Characteristics (T$_J$=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V$_{(BR)DSS}$	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 to Body Leakage Current	V$_{DS}$ =0V, V$_{GS}$ = ±20V	-	-	±100	nA
On Characteristics						
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$= V$_{GS}$, I$_D$= -250μA	-1.0	-1.6	-2.5	V
R$_{DS(on)}$	Static Drain-Source on-Resistance note3	V$_{GS}$ =-10V, I$_D$ =-12A	-	9.3	14	mΩ
		V$_{GS}$ =-4.5V, I$_D$ =-8A	-	14	20	
Dynamic Characteristics						
C$_{iss}$	Input Capacitance	V$_{DS}$ = -15V, V$_{GS}$ = 0V, f = 1.0MHz	-	2800	-	pF
C$_{oss}$	Output Capacitance		-	346	-	pF
C$_{rss}$	Reverse Transfer Capacitance		-	319	-	pF
Q$_g$	Total Gate Charge	V$_{DS}$= -15V, I$_D$ = -12A, V$_{GS}$ = -10V	-	30	-	nC
Q$_{gs}$	Gate-Source Charge		-	5.3	-	nC
Q$_{gd}$	Gate-Drain("Miller") Charge		-	7.6	-	nC
Switching Characteristics						
t$_{d(on)}$	Turn-on Delay Time	V$_{DD}$ = -15V, I$_D$ = -6A, V$_{GS}$=-10V, R$_{GEN}$=2.5Ω	-	14	-	ns
t$_r$	Turn-on Rise Time		-	20	-	ns
t$_{d(off)}$	Turn-off Delay Time		-	95	-	ns
t$_f$	Turn-off Fall Time		-	65	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I$_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-12	A
I$_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-48	A
V$_{SD}$	Drain to Source Diode Forward Voltage	V$_{GS}$ = 0V, I$_S$ = -12A	-	-0.8	-1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. E$_{AS}$ condition: T$_J$=25℃, V$_{DD}$=-15V, V$_G$=-10V, R$_G$=25Ω, L=0.5mH, I$_{AS}$=-16A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%
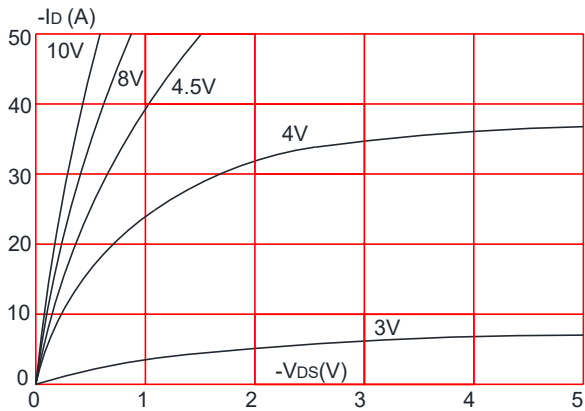
Figure1: Output Characteristics
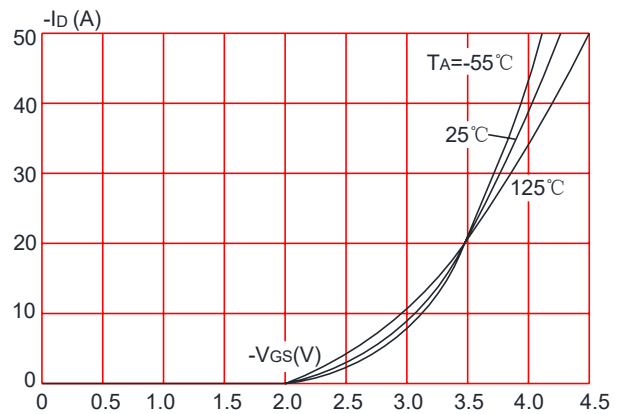
Figure 2: Typical Transfer Characteristics

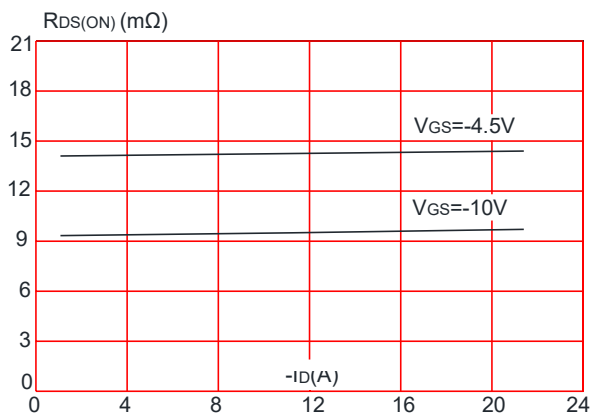**Figure 3:** On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics

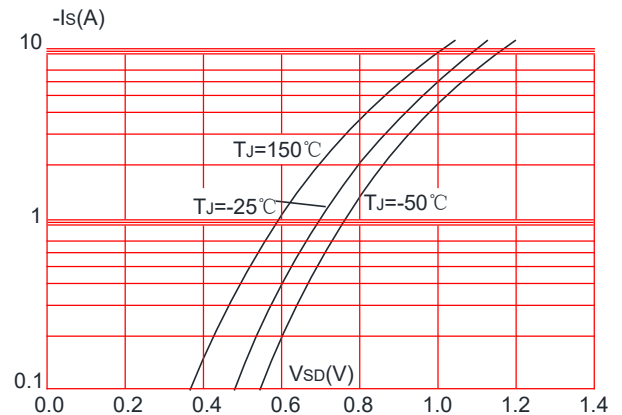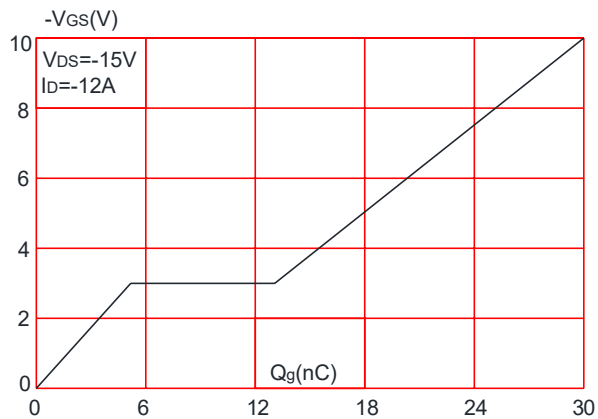**Figure 5:** Gate Charge Characteristics

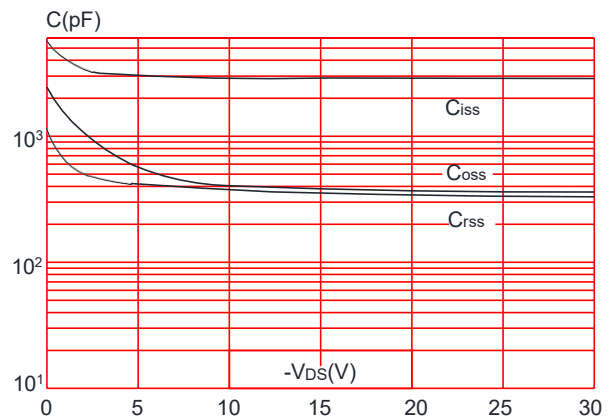**Figure 6:** Capacitance Characteristics

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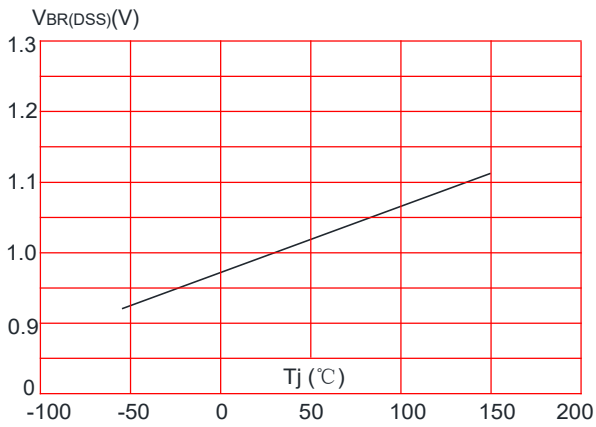**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

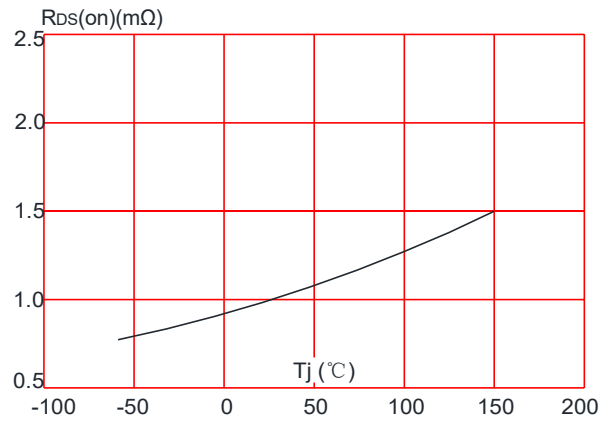**Figure 8:** Normalized on Resistance vs. Junction Temperature
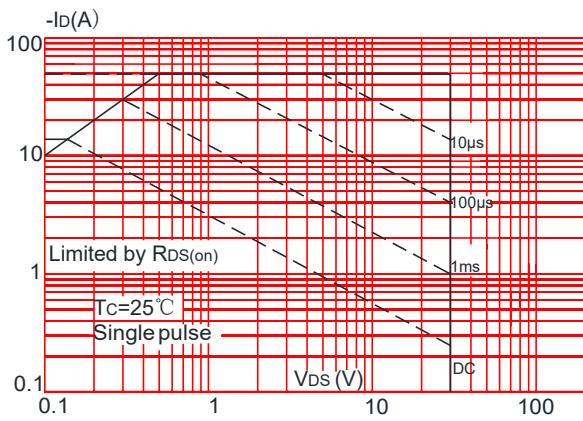

Figure 9: Maximum Safe Operating Area

Figure 10: Maximum Continuous Drain Current vs. Case Temperature

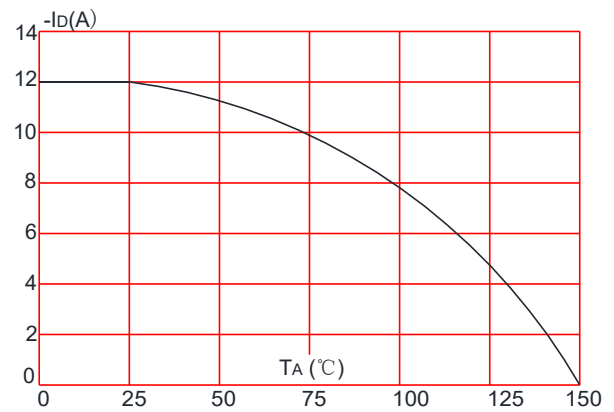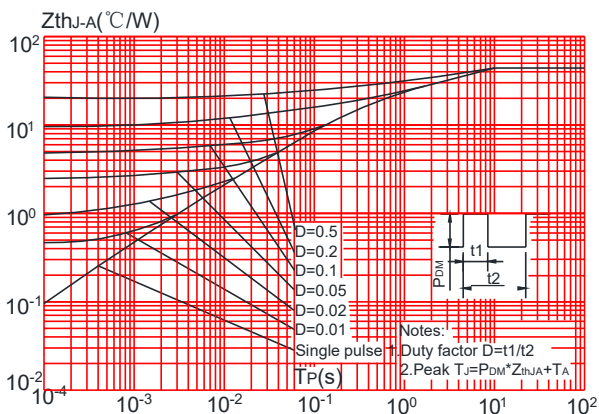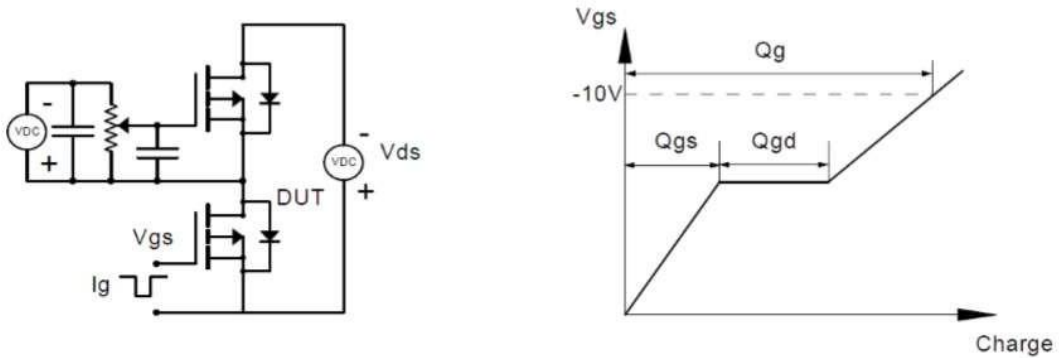**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient
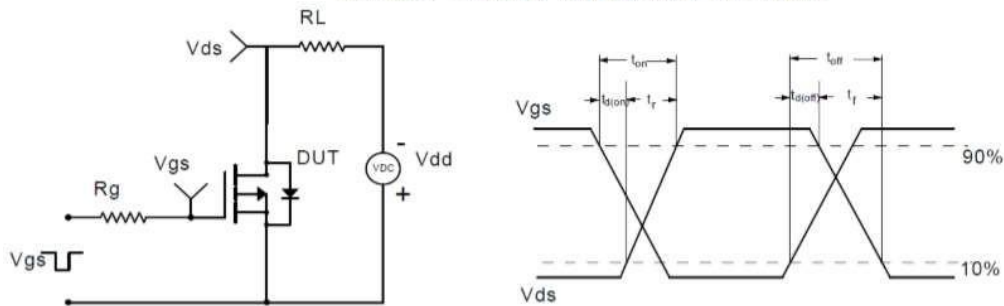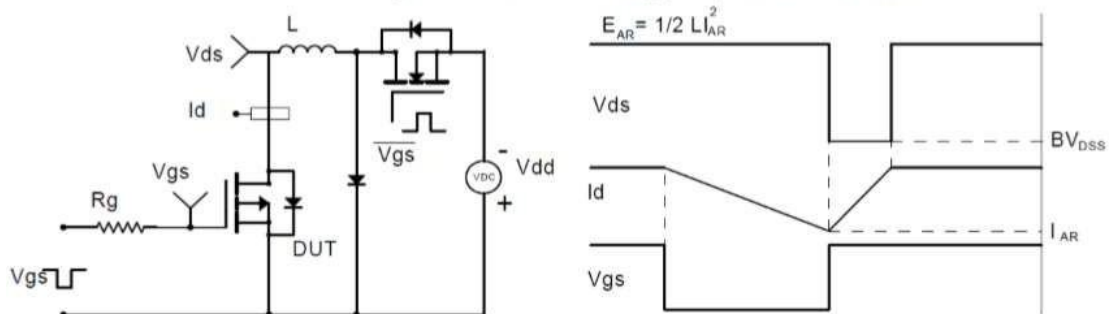
Typical Performance Characteristics
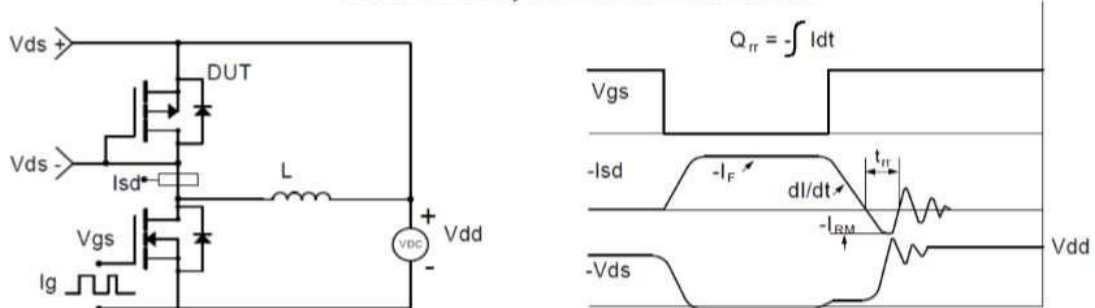
Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

$$E_{AR} = 1/2 \, LI_{AR}^2$$

Diode Recovery Test Circuit & Waveforms

$$Q_{rr} = -\int I dt$$

Package Mechanical Data- SOP-8