

Descriptions

This -6A,-40V P-Channel Enhancement Mode Field Effect Transistor in a SOP-8 Plastic Package.

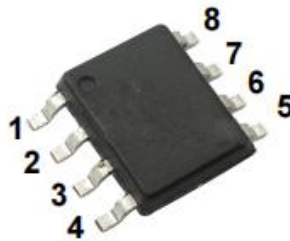
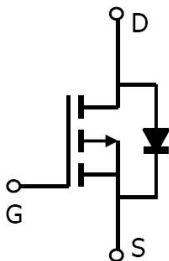
Features

- $V_{DS(V)} = -40V$
- $I_D = -6 A (V_{GS} = -10V)$
- $R_{DS(ON)} < 42m\Omega (V_{GS} = -10V)$
- $R_{DS(ON)} < 63m\Omega (V_{GS} = -4.5V)$
- Halogen-free Product.

Applications

- Battery protection
- Load Switch.

Equivalent Circuit & Pinning



PIN1、PIN 2、PIN 3: Source PIN 4: Gate
PIN5、PIN 6、PIN 7、PIN 8: Drain

Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V _{DSS}	-40	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current	I _D (T _a =25°C)	-6	A
Continuous Drain Current	I _D (T _a =70°C)	-5	A
Pulsed Drain Current ^C	I _{DM}	-40	A
Avalanche Current ^C	I _{AS} , I _{AR}	20	A
Avalanche energy L=0.1mH ^C	E _{AS} , E _{AR}	20	mJ
Power Dissipation ^B	P _D (T _a =25°C)	3.1	W
	P _D (T _a =70°C)	2	W
Junction and Storage Temperature Range	T _j , T _{stg}	-55 ~ 150	°C

Thermal Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum Junction-to-Ambient ^A	R _{θJA}	t ≤ 10s		31	40	°C/W
Maximum Junction-to-Ambient ^{A D}				59	75	
Maximum Junction-to-Lead	R _{θJL}			16	24	°C/W

Note:

A. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design.

B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using ≤10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.

D. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5%max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T_{J(MAX)}=150°C. The SOA curve provides a single pulse rating.

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=-250\mu A$ $V_{GS}=0V$	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40$ $V_{GS}=0V$			-1.0	μA
		$V_{DS}=-40$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V$ $V_{GS}=\pm 20$			± 10 0	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.5	-2.0	-2.6	V
On state drain current	$I_{D(ON)}$	$V_{GS}=-10V$ $V_{DS}=-5V$	40			A
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V$ $I_D=-6A$		35	42	m Ω
		$V_{GS}=-10V$ $I_D=-6A$ $T_J=125^\circ C$		53	65	
		$V_{GS}=-4.5V$ $I_D=-5.0A$		46.5	63	
Forward Transconductance	g_{FS}	$V_{DS}=-5V$ $I_D=-6A$		17		S
Diode Forward Voltage	V_{SD}	$I_S=-1A$ $V_{GS}=0V$		- 0.76	-1.0	V
Maximum Body-Diode Continuous Current	I_S				-3.5	A
Total Gate Charge	$Q_{g(10V)}$	$V_{GS}=-10V$ $V_{DS}=-20V$ $I_D=-6A$		17.3	22	nC
Total Gate Charge	$Q_{g(4.5V)}$			8.4	11	
Gate-Source Charge	Q_{gs}			3.2		
Gate-Drain Charge	Q_{gd}			4.3		
Gate Resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$	7.0	14	21	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V$ $V_{DS}=-20V$ $f=1MHz$	750	940	117 5	pF
Output Capacitance	C_{oss}			97		
Reverse Transfer Capacitance	C_{rss}			72		
Turn-on Delay Time	$t_{d(ON)}$	$V_{GS}=-10V$ $V_{DS}=-20V$ $R_L=3.35\Omega$ $R_{GEN}=3\Omega$		10.3		ns
Turn-on Rise Time	t_r			4.3		
Turn-off Delay Time	$t_{d(OFF)}$			39		
Turn-off Fall Time	t_f			46.5		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-6A$ $di/dt=100A/\mu s$		17	24	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=-6A$ $di/dt=100A/\mu s$		11.5		nC

Electrical Characteristic Curve

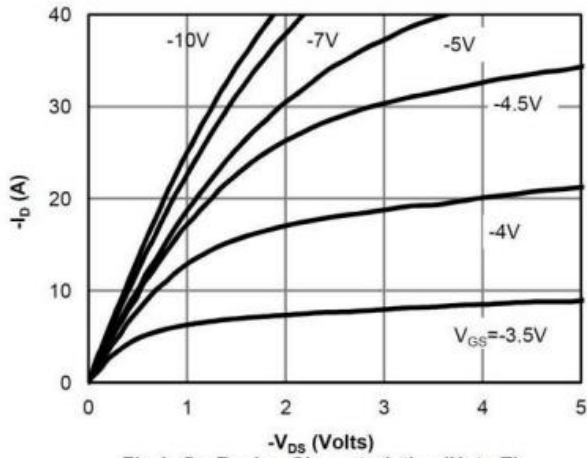


Fig 1: On-Region Characteristics (Note E)

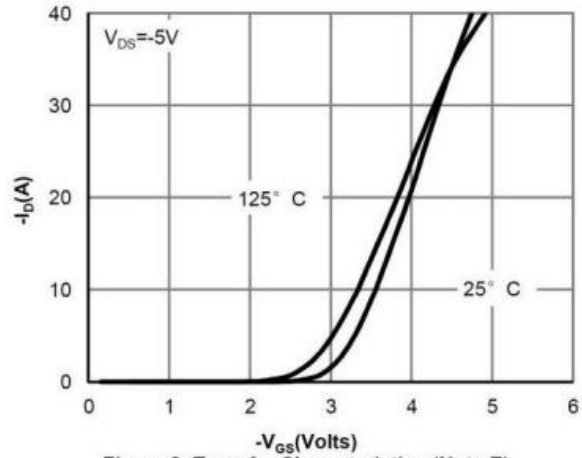


Figure 2: Transfer Characteristics (Note E)

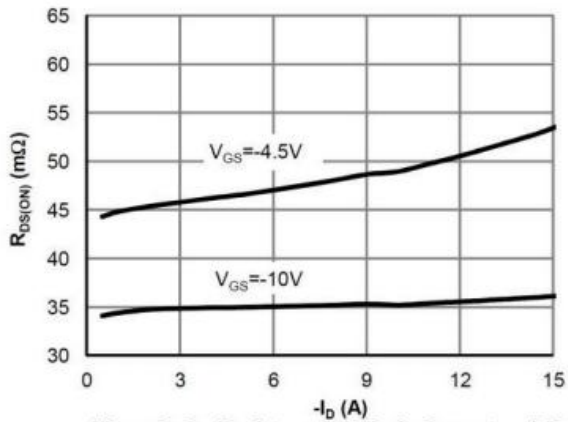


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

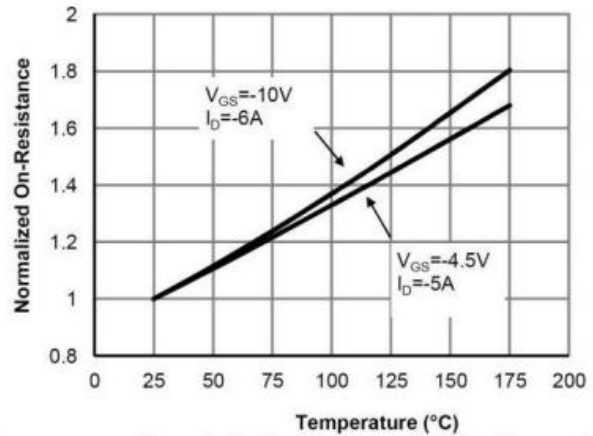


Figure 4: On-Resistance vs. Junction Temperature (Note E)

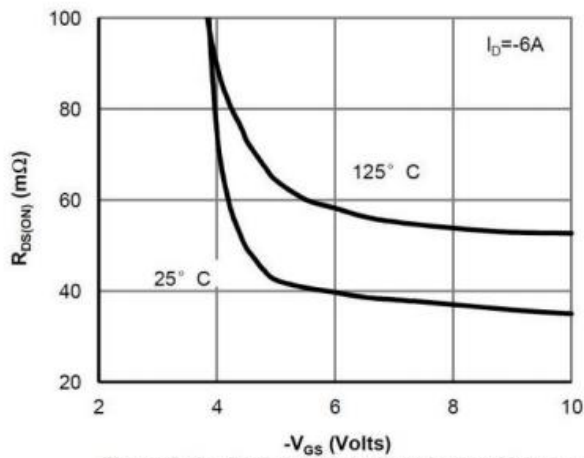


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

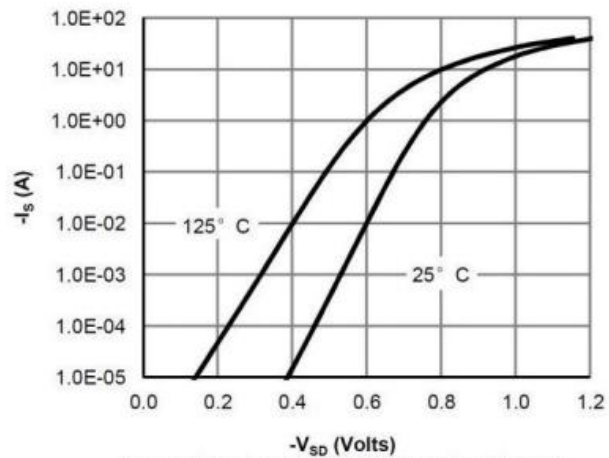


Figure 6: Body-Diode Characteristics (Note E)

Electrical Characteristic Curve

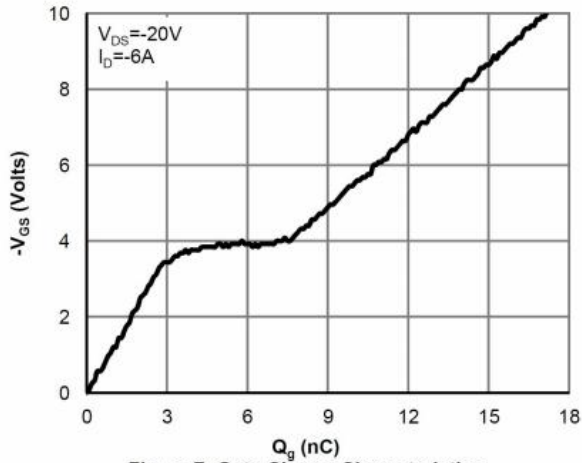


Figure 7: Gate-Charge Characteristics

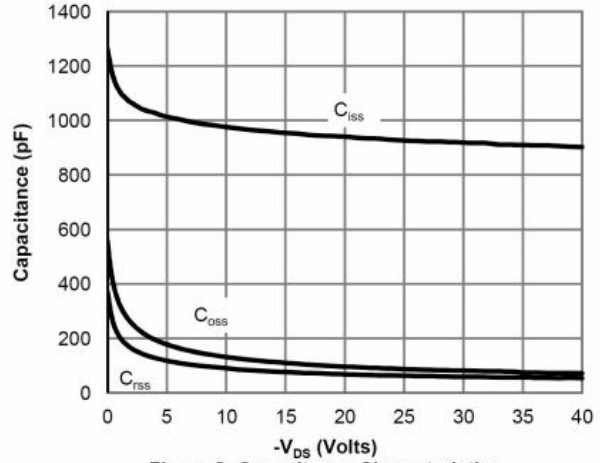


Figure 8: Capacitance Characteristics

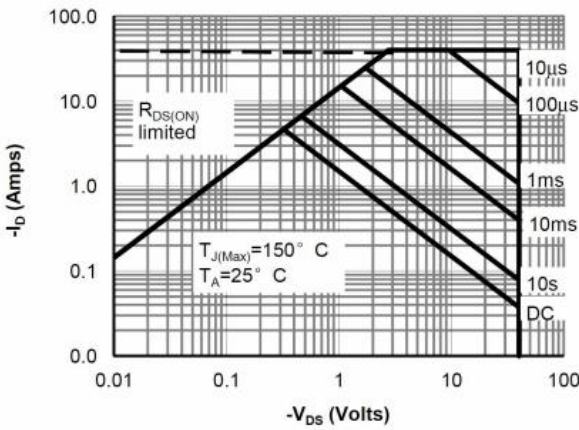


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

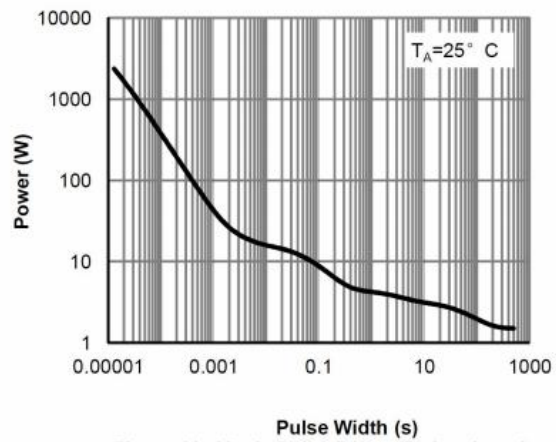


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

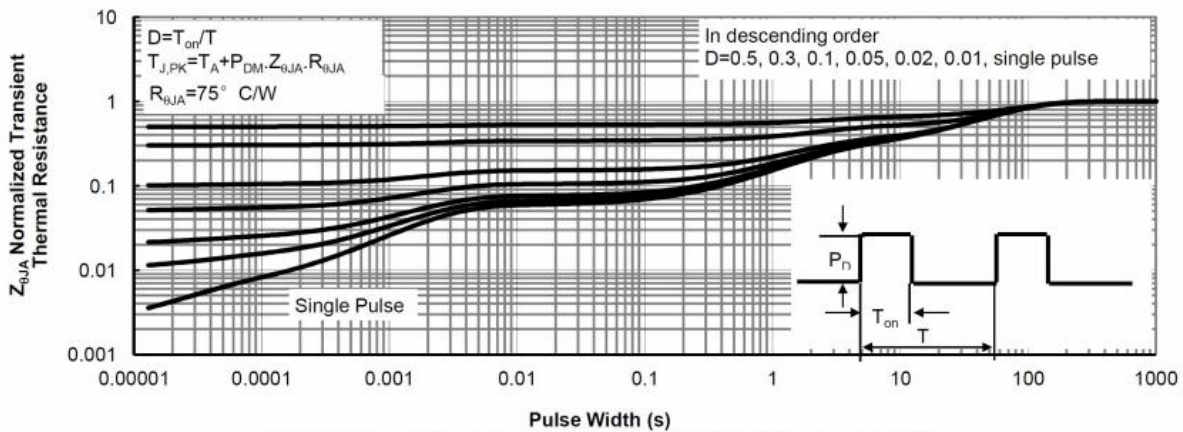
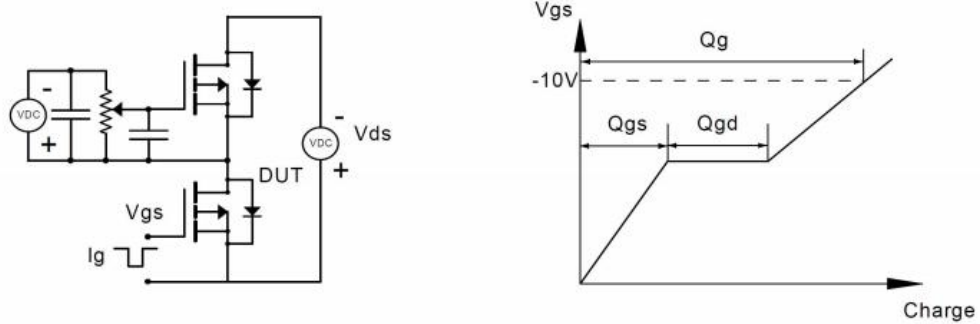


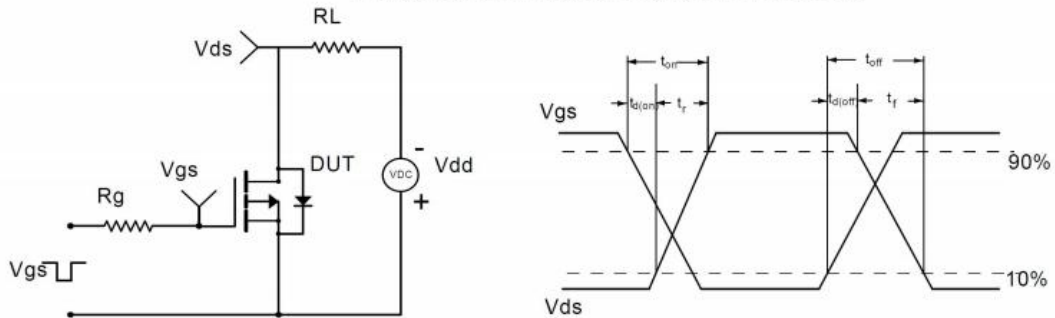
Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

Test Circuit & Waveform

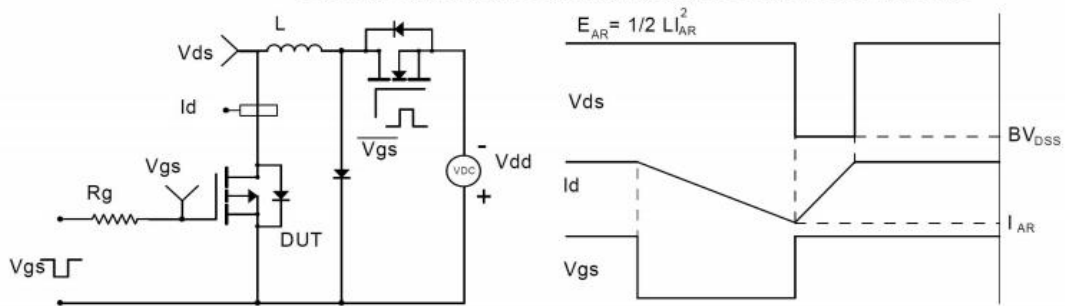
Gate Charge Test Circuit & Waveform



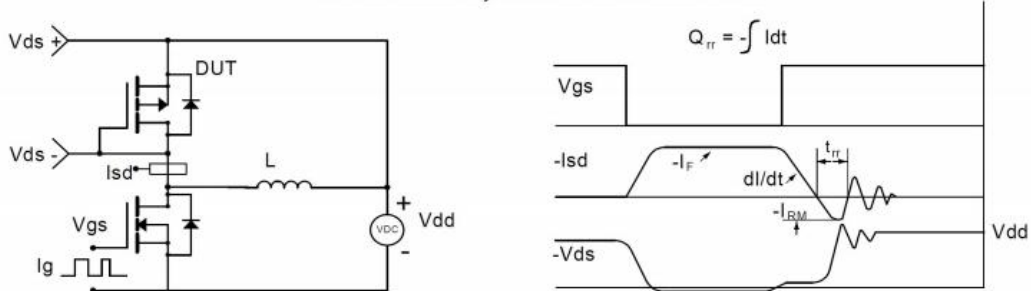
Resistive Switching Test Circuit & Waveforms



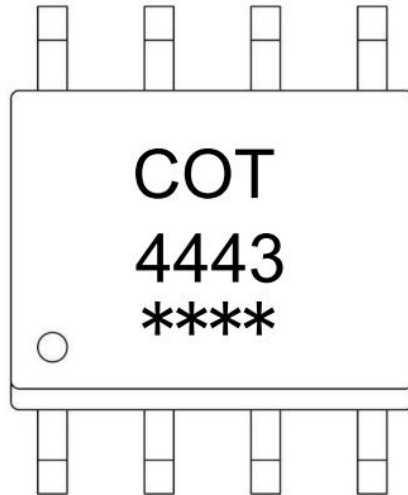
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Marking Instructions



Note:

COT: Company Logo

4443: Product Type.

****: Lot No. Code, code change with Lot No.

Packaging SPEC

REEL INFORMATION

Package Type	Units					Dimension (unit: mm ³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
SOP-8	4,000	2	8,000	6	48,000	13" ×12	360×360×50	380×335×366

Package Outline Dimensions

SOP-8

Unit:mm

