

Description

This 4.5A,60V N-Channel Enhancement Mode Field Effect Transistor in a SOP-8 Plastic Package.

Features

- $V_{DS} (V) = 60V$
- $I_D = 4.5 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 50m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 65m\Omega (V_{GS} = 4.5V)$
- Halogen-free Product.

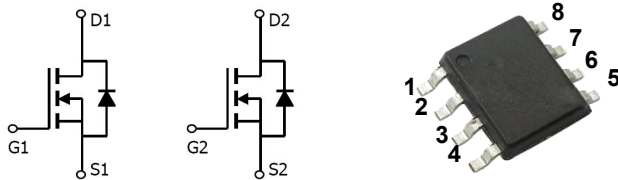
Applications

Uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge.

This device is suitable for use as a load switch or in PWM applications..

V_{DSS}	$R_{DS(on)}$ Typ	I_D
60V	45m Ω	4.5A

Equivalent Circuit & Pinning



PIN 1 : S2 PIN 2 : G2 PIN 3 : S1 PIN 4 : G1
PIN 5 : D1 PIN 6 : D1 PIN 7 : D2 PIN 8 : D2

Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ^{AF}	$I_D (T_a=25^\circ\text{C})$	4.5	A
Continuous Drain Current ^{AF}	$I_D (T_a=70^\circ\text{C})$	3.6	A
Pulsed Drain Current ^B	I_{DM}	20	A
Power Dissipation for Single Operation ^A	$P_D (T_a=25^\circ\text{C})$	2	W
Power Dissipation for Single Operation ^A	$P_D (T_a=70^\circ\text{C})$	1.28	W
Avalanche Current ^B	I_{AR}, I_{AR}	19	A
Repetitive avalanche energy 0.1mH ^B	E_{AR}, E_{AS}	18	mJ
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	$R_{\theta JA}$	$t \leq 10\text{s}$		48	62.5	°C/W
Maximum Junction-to-Ambient ^{A D}		steady-State		74	110	
Maximum Junction-to-Case	$R_{\theta JC}$	Steady-State		35	60	

Note:

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

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

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The SOA curve provides a single pulse rating.

F: The current rating is based on the $t \leq 10\text{s}$ junction to ambient thermal resistance rating.

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A$ $V_{GS}=0V$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V$ $V_{GS}=0V$			1	μA
		$V_{DS}=60V$ $V_{GS}=0V$ $T_J=55^\circ C$			5	
Gate-Body leakage current	I_{GSS}	$V_{DS}=0V$ $V_{GS}=\pm 20V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1.0	1.6	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=4.5A$		45	50	m Ω
		$V_{GS}=10V$ $I_D=4.5A$ $T_J=125^\circ C$		79	100	
		$V_{GS}=4.5V$ $I_D=3A$		55	65	
Forward Transconductance	g_{FS}	$V_{DS}=5V$ $I_D=4.5A$		8.0		S
Diode Forward Voltage	V_{SD}	$I_S=1A$ $V_{GS}=0V$		0.74	1	V
Maximum Body-Diode Continuous Current	I_S				3	A
Pulsed Body Diode Current ^B	I_{SM}				20	A
DYNAMIC PARAMETERS						
Input Capacitance	C_{iss}	$V_{GS}=0V$ $f=1MHz$		665		pF
Output Capacitance	C_{oss}			76		
Reverse Transfer Capacitance	C_{rss}			20		
Gate resistance	R_g	$V_{GS}=0V$, $V_{DS}=0V$, $f=1MHz$		2.2		Ω
SWITCHING PARAMETERS						
Total Gate Charge	$Q_g(10V)$	$V_{GS}=10V$ $V_{DS}=30V$ $I_D=4.5A$		8.5	10.5	nC
Total Gate Charge	$Q_g(4.5V)$			4.3	5.5	nC
Gate-Source Charge	Q_{gs}			1.6		nC
Gate-Drain Charge	Q_{gd}			2.2		nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=30V$ $R_L=6.7\Omega$, $R_{GEN}=3\Omega$		4.7		ns
Turn-on Rise Time	t_r			2.3		
Turn-off Delay Time	$t_{d(off)}$			15.7		
Turn-off Fall Time	t_f			1.9		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=4.5A$, $di/dt=100A/ms$		27.5	35	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=4.5A$, $di/dt=100A/ms$		32		nC

Electrical Characteristic Curve

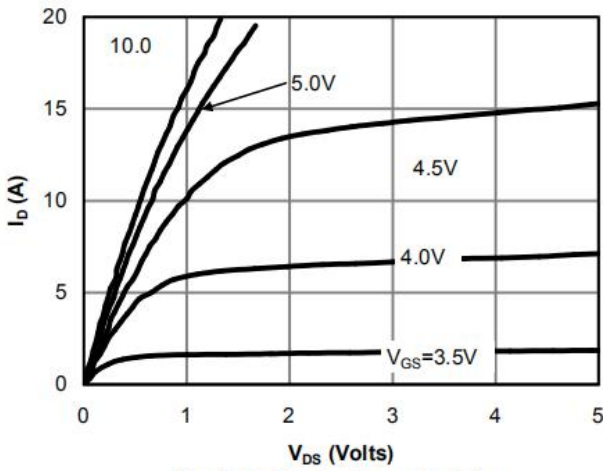


Fig 1: On-Region Characteristics

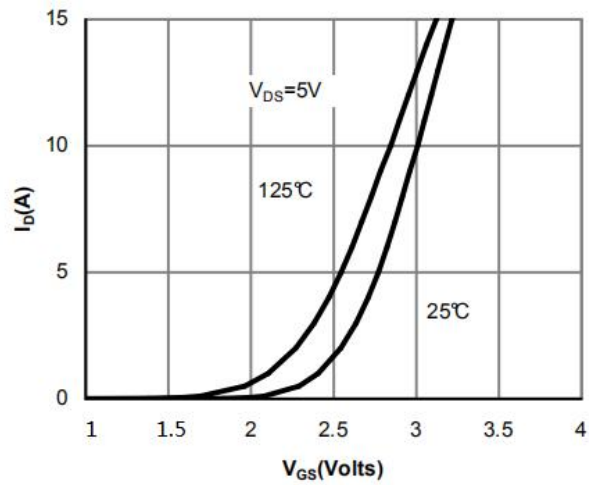


Figure 2: Transfer Characteristics

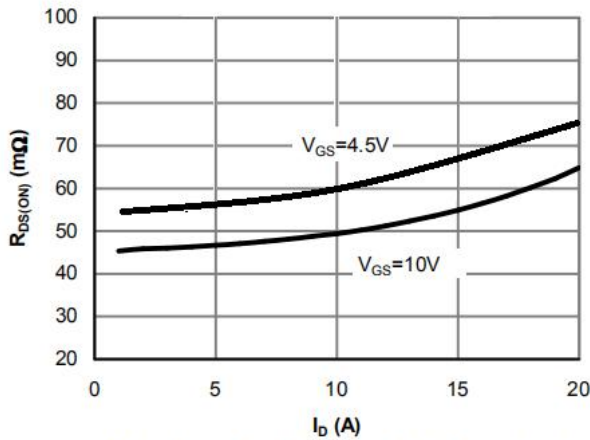


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

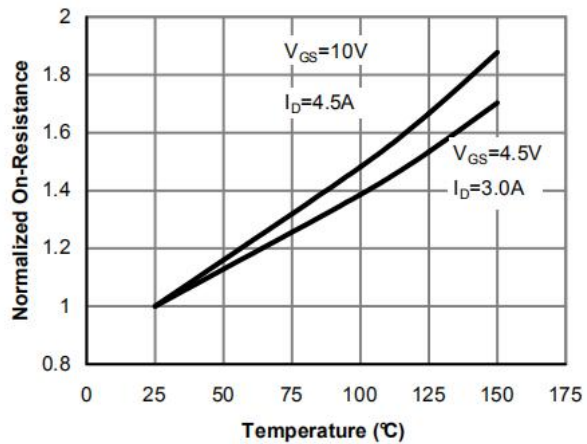


Figure 4: On-Resistance vs. Junction Temperature

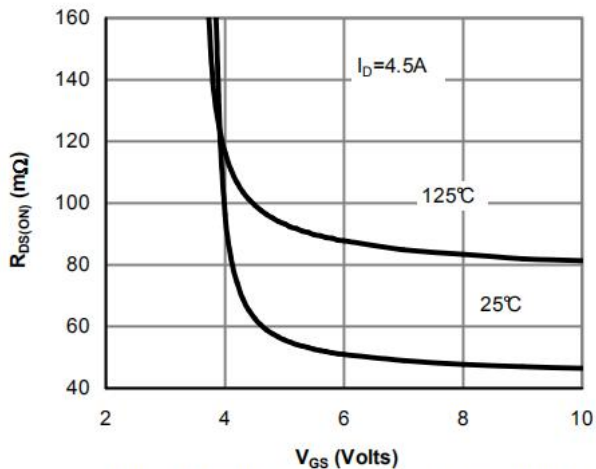


Figure 5: On-Resistance vs. Gate-Source Voltage

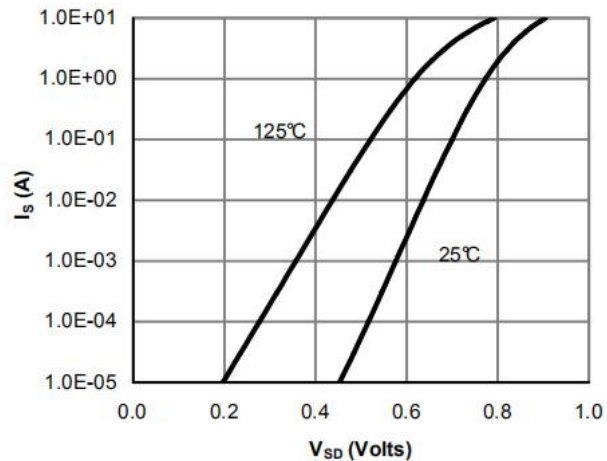


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

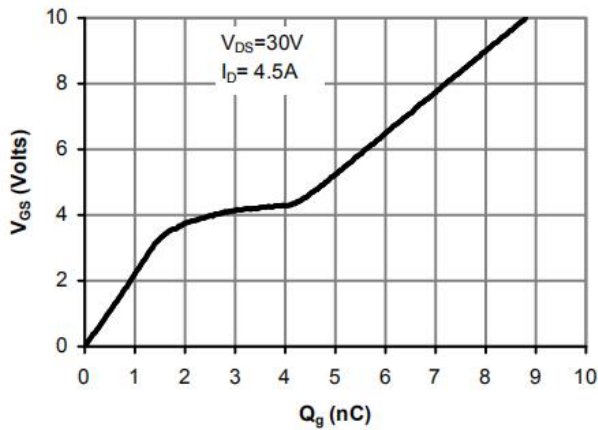


Figure 7: Gate-Charge Characteristics

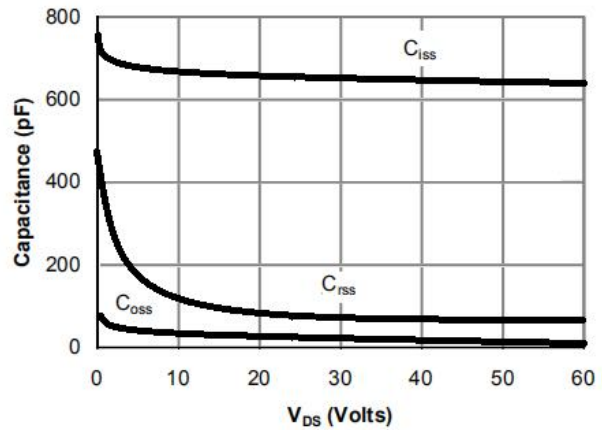


Figure 8: Capacitance Characteristics

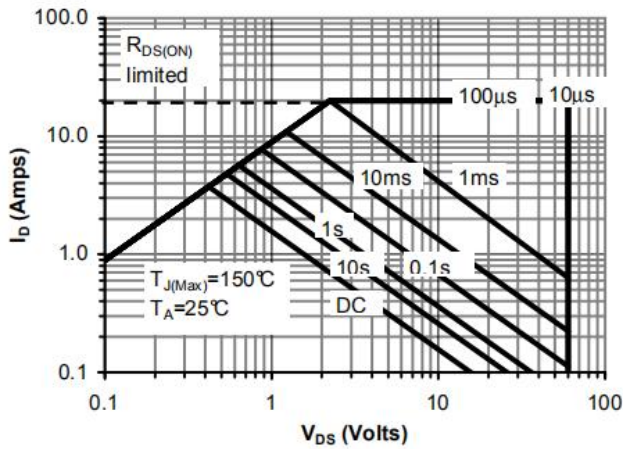


Figure 9: Maximum Forward Biased Safe Operating Area

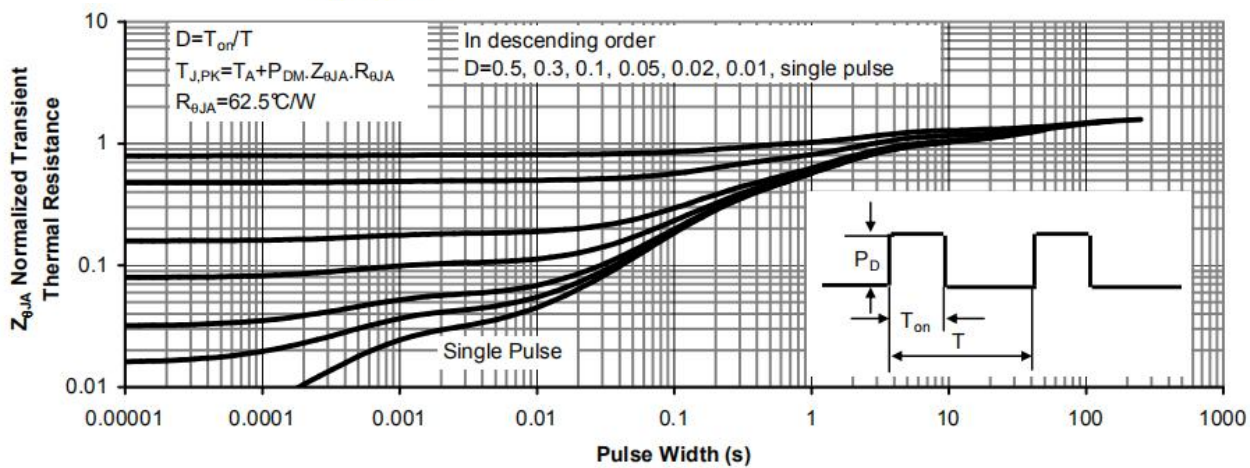
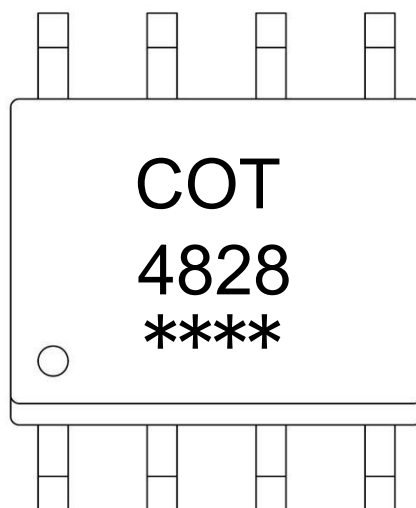


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:

COT: Company Logo

4828: Product Type.

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

Packaging SPEC.

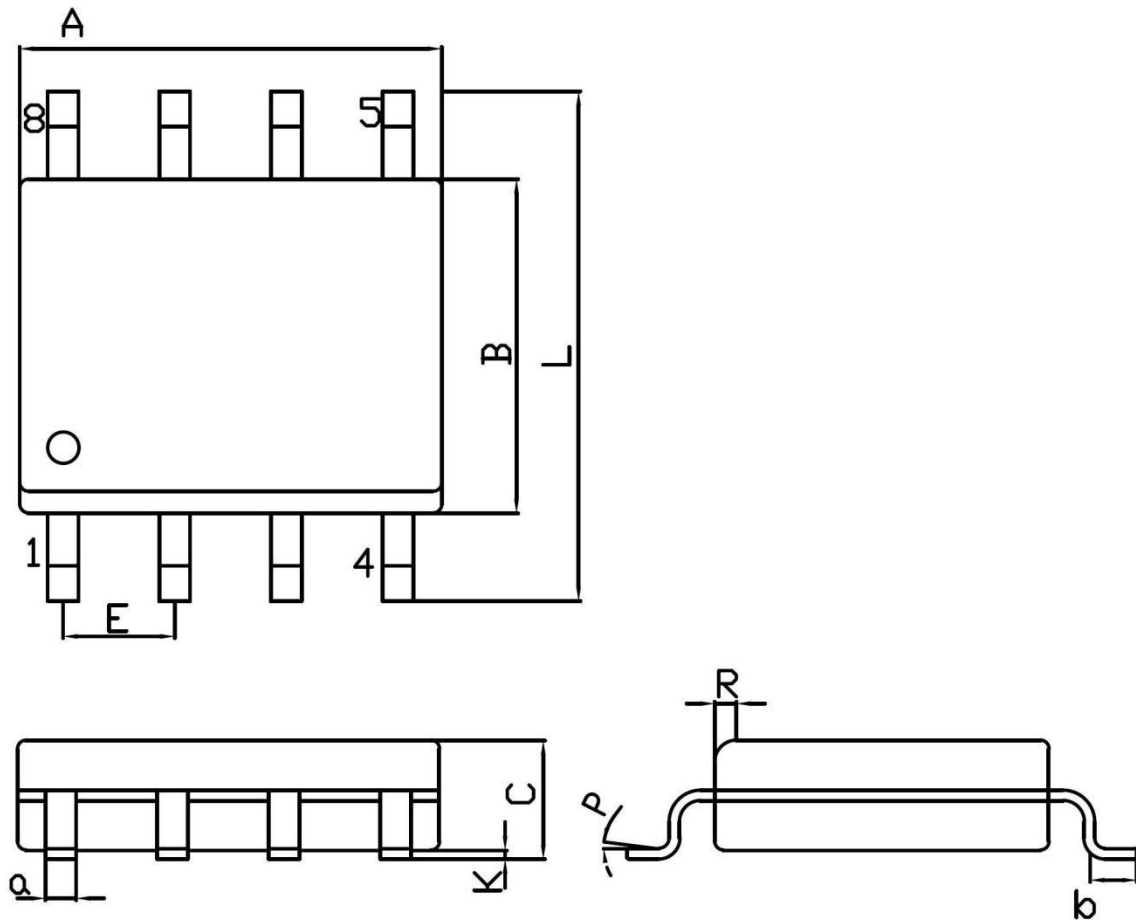
REEL INFORMATION

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" x12	360×360×50	380×335×366

Package Outline Dimensions

SOP-8

Unit:mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.70	5.10	c	1.35	1.75
B	3.70	4.10	a	0.35	0.49
L	5.80	6.20	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.12	0.22	b	0.40	1.25