

Descriptions

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

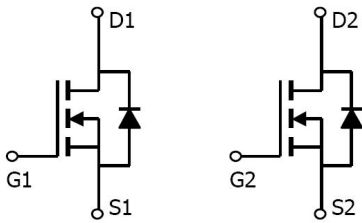
Features

- V_{DS} (V) = 60V
- I_D = 4.5 A (V_{GS} = 10V)
- $R_{DS(ON)}$ < 50m Ω (V_{GS} = 10V)
- $R_{DS(ON)}$ < 65m Ω (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..

Equivalent Circuit



Pinning



PIN1: 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_{AS}	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

Electrical Characteristics(Ta=25°C)

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}		teady-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 =250μA 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°C			5	
Gate-Body leakage current	I _{GSS}	V _{DS} =0V V _{GS} =±20V			100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =250μA	1.0	1.6	3.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V I _D =4.5A		45	50	mΩ
		V _{GS} =10V I _D =4.5A T _J =125°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 =6.7Ω, R _{GEN} =3Ω		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

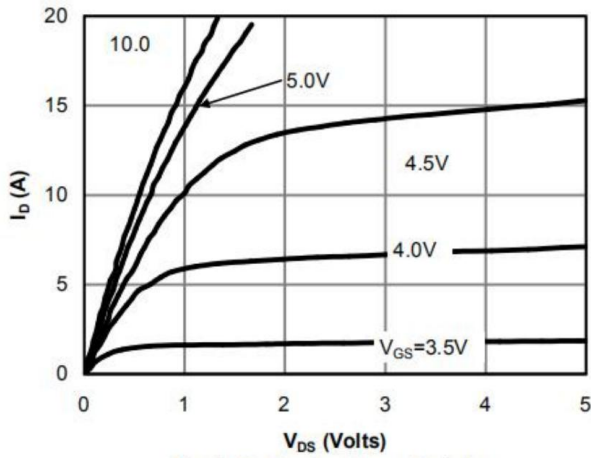


Fig 1: On-Region Characteristics

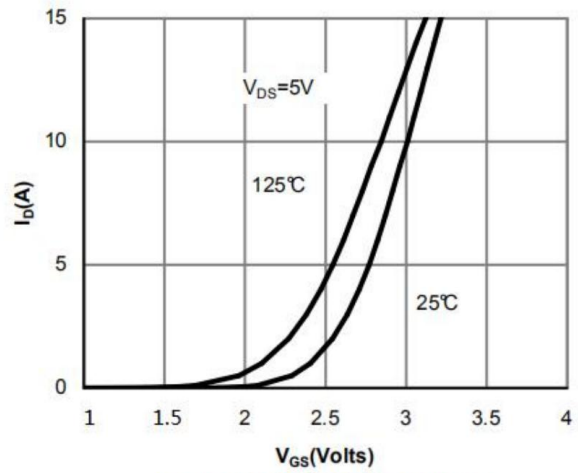


Figure 2: Transfer Characteristics

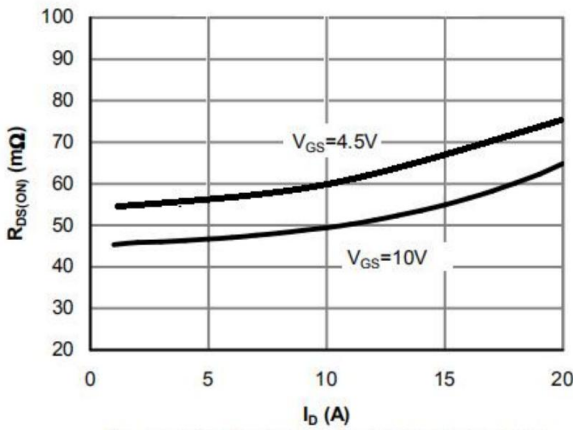


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

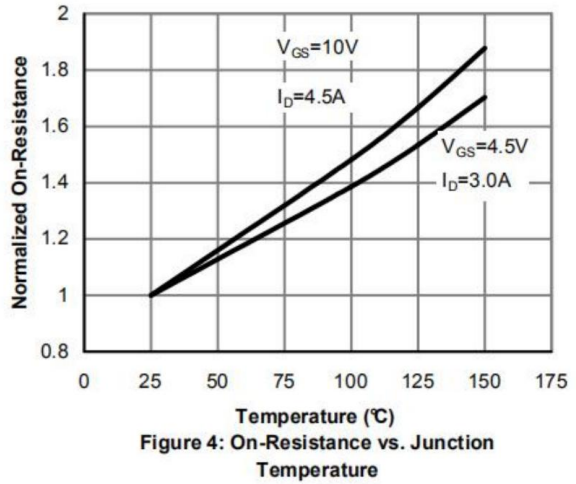


Figure 4: On-Resistance vs. Junction Temperature

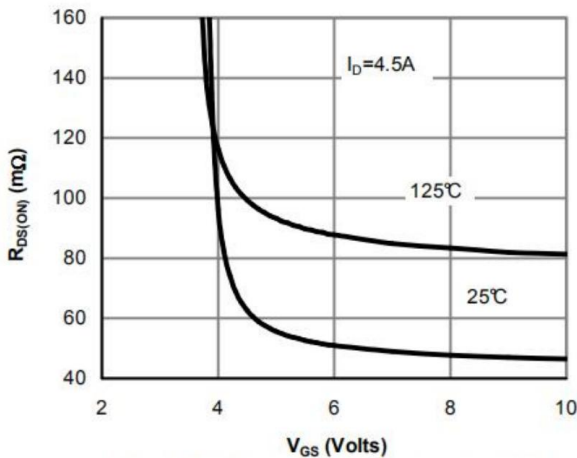


Figure 5: On-Resistance vs. Gate-Source Voltage

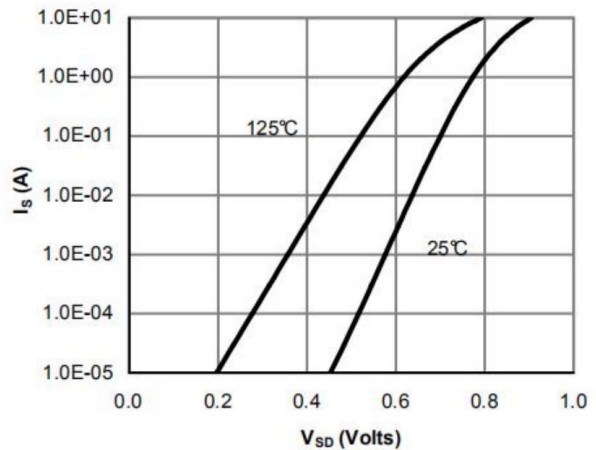


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

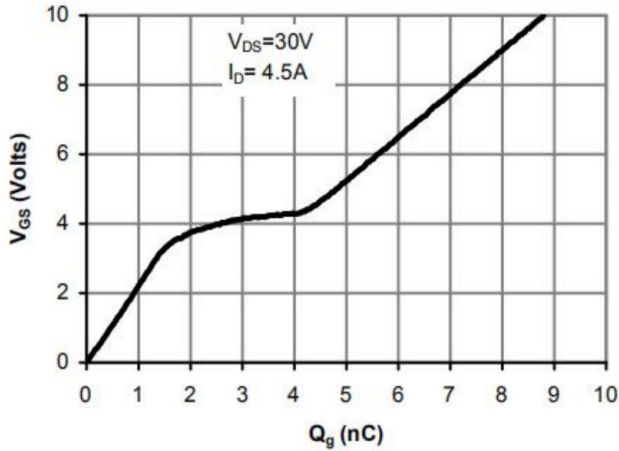


Figure 7: Gate-Charge Characteristics

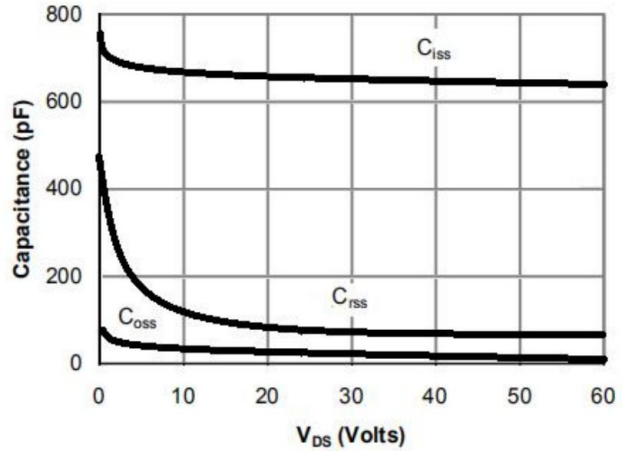


Figure 8: Capacitance Characteristics

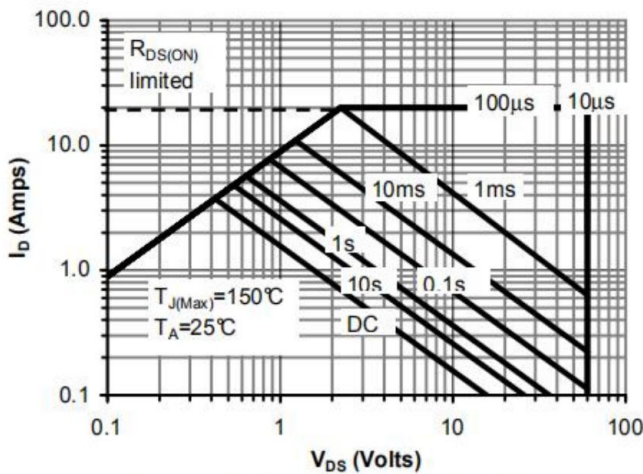


Figure 9: Maximum Forward Biased Safe Operating Area

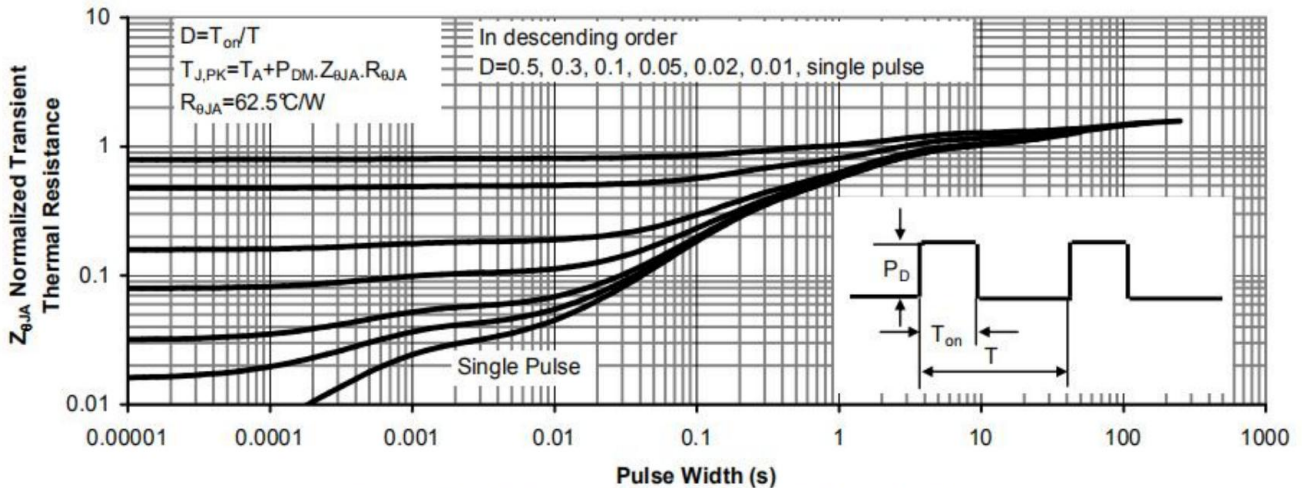
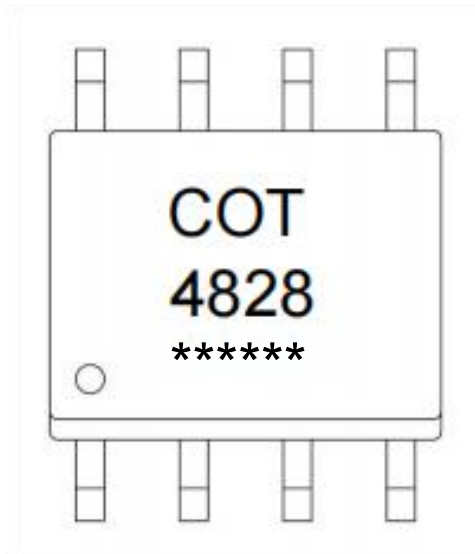


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



- Note:
- COT: Company Logo
 - 4828: Product Type.
 - *****: Lot No. Code, code change with Lot No.

Packaging SPEC

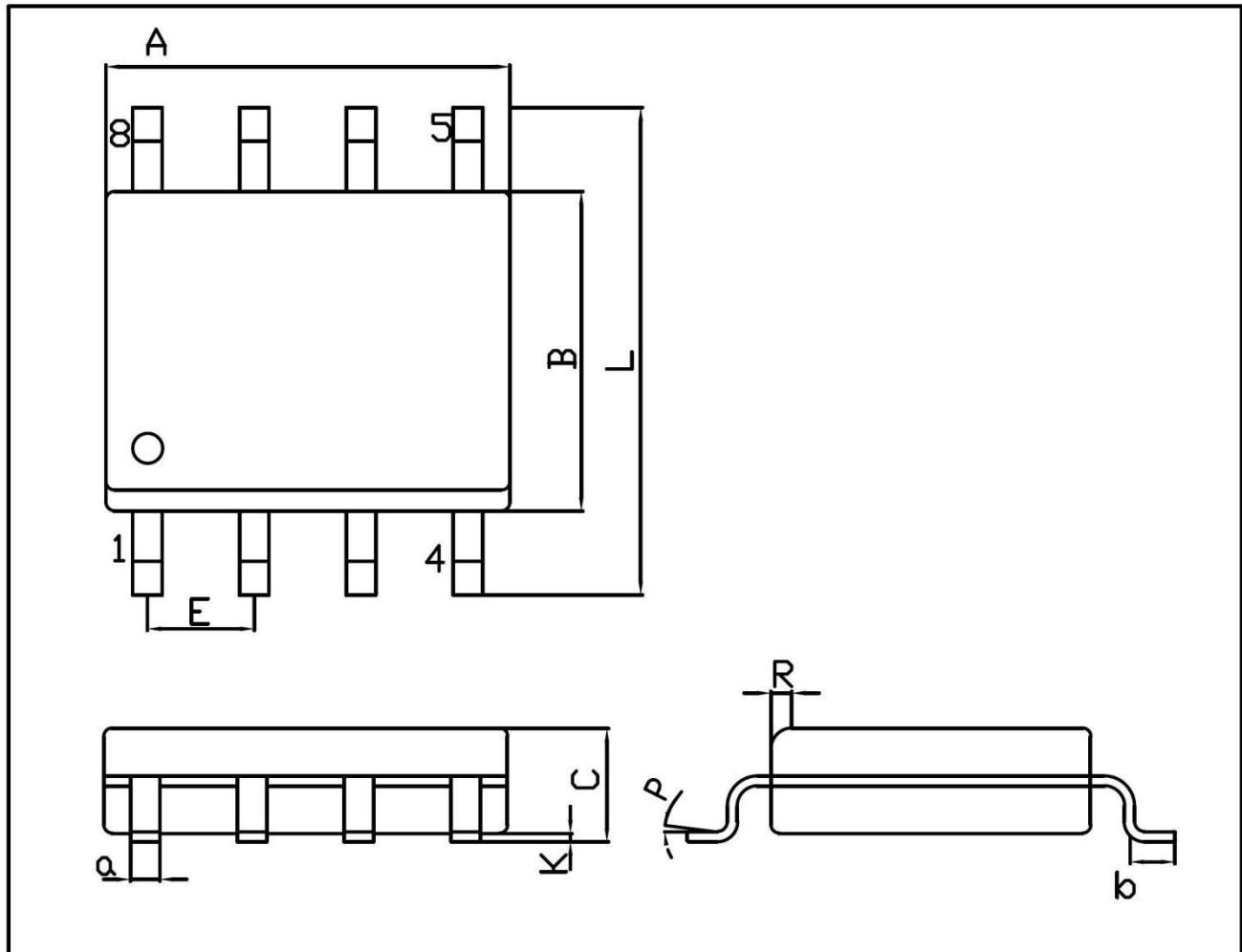
REEL INFORMATION

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" ×12	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