

Description

This $\pm 30\text{V}$ N-Channel and P-Channel complementary Enhancement MOSFET in a SOP-8 Plastic Package.

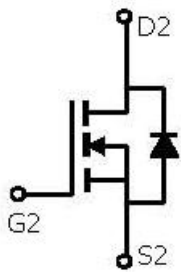
Applications

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies. And suitable for use as a load switch or in PWM applications.

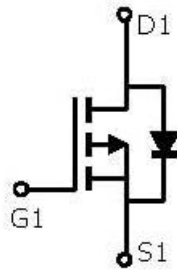
Features

- | | |
|---|---|
| ● N-channel | ● P-channel |
| ● $V_{DS}(V)=30\text{V}$ | ● $V_{DS}(V)=-30\text{V}$ |
| ● $I_D=6.9\text{A}$ | ● $I_D=6.0\text{A}$ |
| ● $R_{DS(ON)}(\text{Typ})=21.6\text{m}\Omega(V_{GS}=10\text{V})$ | ● $R_{DS(ON)}(\text{Typ})=50.3\text{m}\Omega(V_{GS}=10\text{V})$ |
| ● $R_{DS(ON)}(\text{Typ})=31.8\text{m}\Omega(V_{GS}=4.5\text{V})$ | ● $R_{DS(ON)}(\text{Typ})=79.4\text{m}\Omega(V_{GS}=4.5\text{V})$ |
| ● Halogen-free Product. | ● Halogen-free Product. |

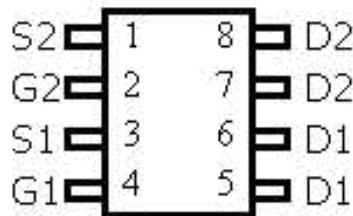
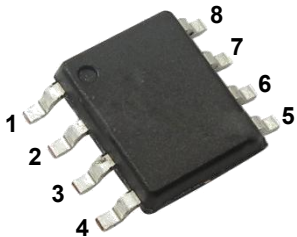
Equivalent Circuit & Pinning



n-channel



p-channel



Absolute Maximum Ratings($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Rating		Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DSS}	± 30		V
Gate-Source Voltage	V_{GSS}	± 20		V
Continuous Drain Current ^A	$I_{\text{D}} (T_A=25^{\circ}\text{C})$	6.9	-6.0	A
	$I_{\text{D}} (T_A=70^{\circ}\text{C})$	5.8	-5.0	A
Pulsed Drain Current ^B	I_{DM}	± 30		A
Power Dissipation	$P_{\text{D}} (T_A=25^{\circ}\text{C})$	2		W
	$P_{\text{D}} (T_A=70^{\circ}\text{C})$	1.44		W
Maximum Junction-to-Ambient ^A	$R_{\theta\text{JA}} (t \leq 10\text{s})$	62.5		$^{\circ}\text{C/W}$
	$R_{\theta\text{JA}}$ (Steady-State)	90		$^{\circ}\text{C/W}$
Maximum Junction-to-Lead ^C	$R_{\theta\text{JL}}$ (Steady-State)	40		$^{\circ}\text{C/W}$
Junction and Storage Temperature Range	$T_{\text{J}}, T_{\text{STG}}$	-55 to +150		$^{\circ}\text{C}$

Notes:

A: The value of $R_{\theta\text{JA}}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^{\circ}\text{C}$. The value in any a given application depends on the user's specific board design. The current rating is based on the $t \leq 10\text{s}$ thermal resistance rating.

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

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

D: The static characteristics in Figures 1 to 6, 12, 14 are obtained using 80 μs 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.

N-Channel Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	30	33.7		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V$ $V_{GS}=0V$			1.0	μA
		$V_{DS}=24V$ $V_{GS}=0V$ $T_J=55^\circ C$			5.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1.1	1.7	2.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=6.9A$		21.6	32	m Ω
		$V_{GS}=4.5V$ $I_D=5.0A$		31.8	40	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1.0A$		0.78	1.0	V
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		325		pF
Output Capacitance	C_{oss}			140		pF
Reverse Transfer Capacitance	C_{rss}			30		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		4.6		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=10V$ $V_{DS}=15V$ $I_D=6A$		5.2		nC
Total Gate Charge(4.5V)				2.5		nC
Gate-Source Charge	Q_{gs}			0.8		nC
Gate-Drain Charge	Q_{gd}			1.3		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=15V$ $V_{GS}=10V$ $R_L=2.5\Omega$ $R_{GEN}=3\Omega$		4.5		ns
Turn-On Rise Time	t_r			2.5		ns
Turn-Off Delay Time	$t_{d(off)}$			14.5		ns
Turn-Off Fall Time	t_f			3.5		ns

N-Channel Electrical Characteristic Curve

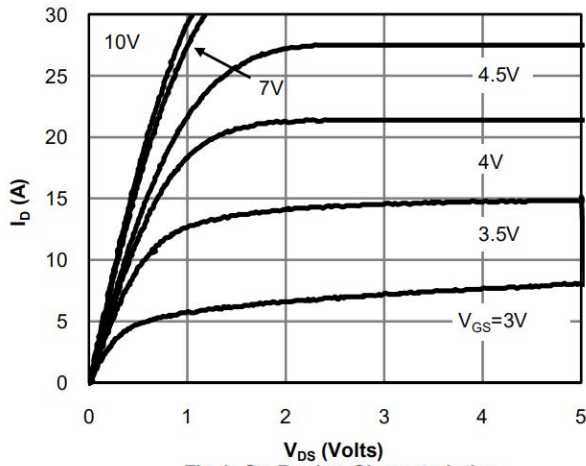


Fig 1: On-Region Characteristics

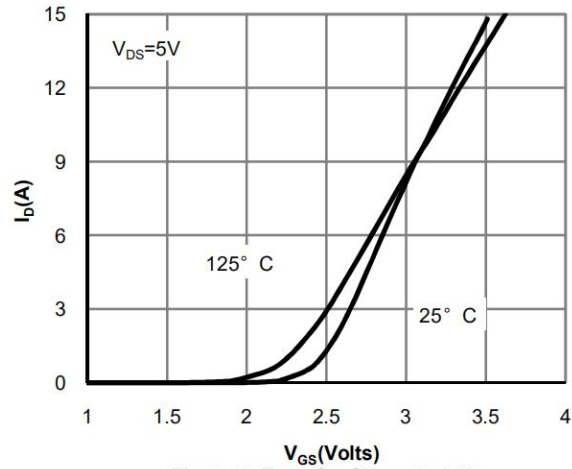


Figure 2: Transfer Characteristics

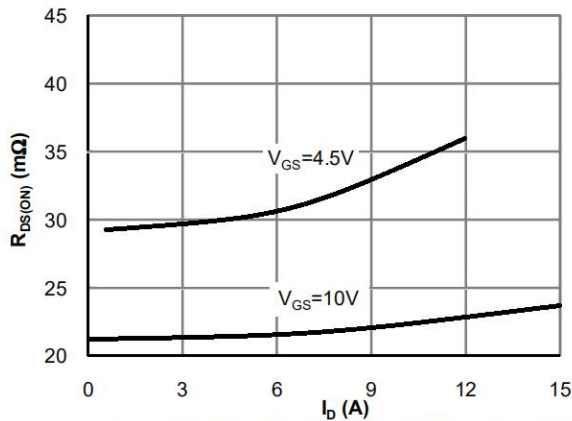


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

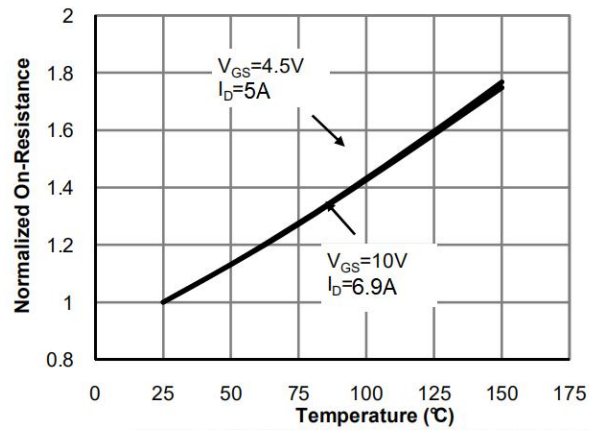


Figure 4: On-Resistance vs. Junction Temperature

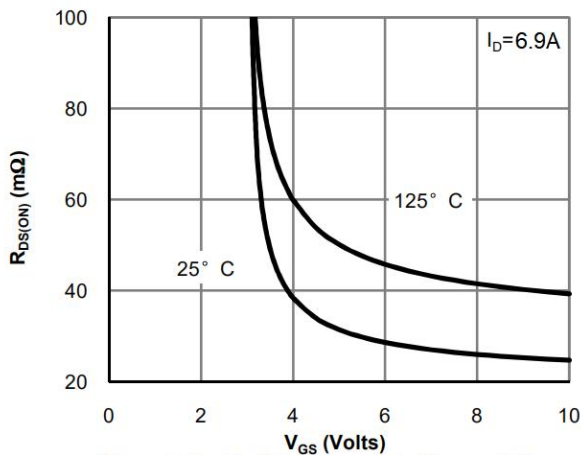


Figure 5: On-Resistance vs. Gate-Source Voltage

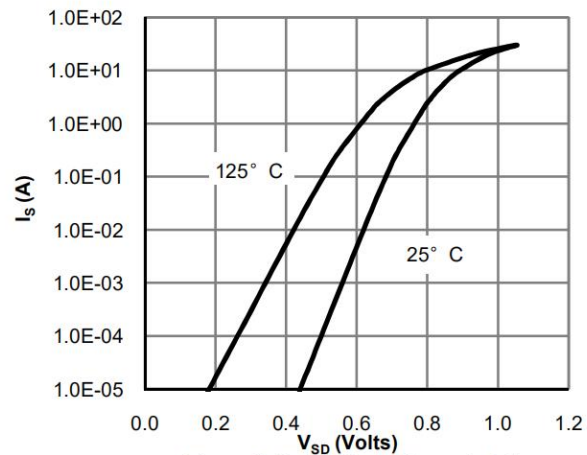


Figure 6: Body-Diode Characteristics

N-Channel Electrical Characteristic Curve

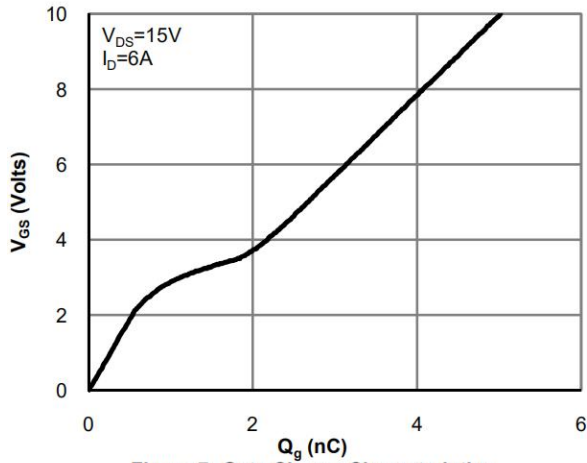


Figure 7: Gate-Charge Characteristics

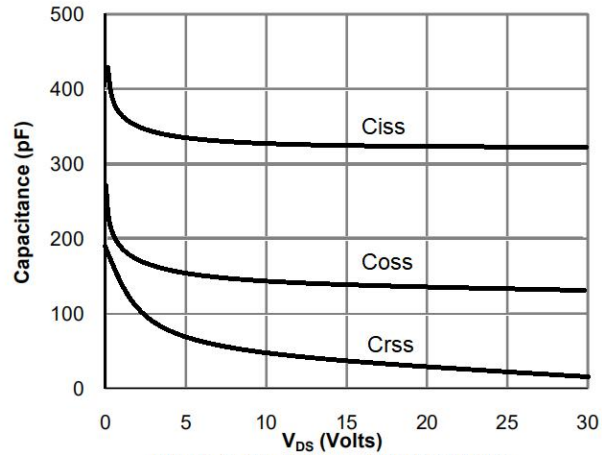


Figure 8: Capacitance Characteristics

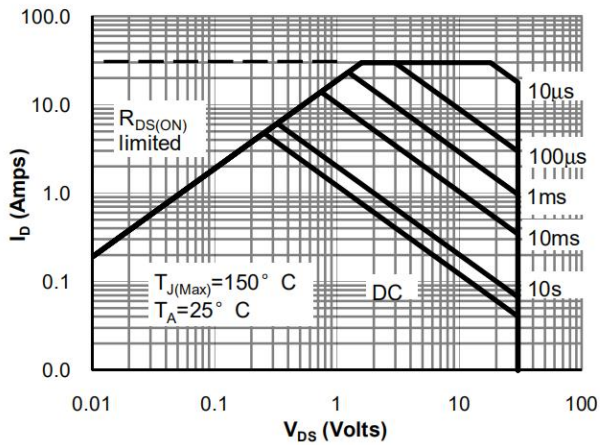


Figure 9: Maximum Forward Biased Safe Operating Area

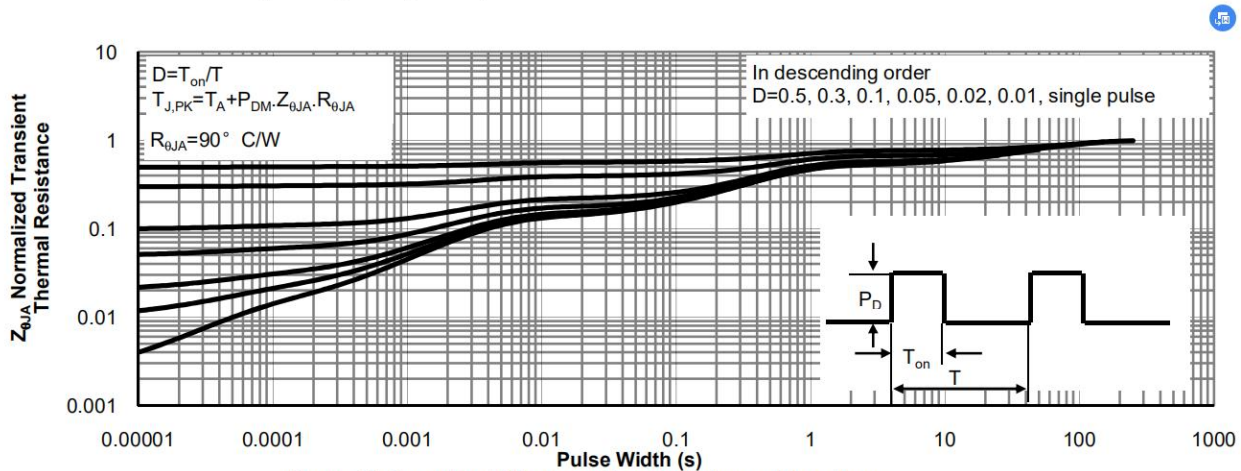


Figure 10: Normalized Maximum Transient Thermal Impedance

P-Channel Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-30	-33.8		V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V$ $V_{GS}=0V$			-1.0	μA
		$V_{DS}=-24V$ $V_{GS}=0V$ $T_J=55^\circ C$			-5.0	μA
Gate-Body leakage current	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.3	-1.85	-2.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-6.0A$		50.3	70	m Ω
		$V_{GS}=-4.5V$ $I_D=-5.0A$		79.4	90	m Ω
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1.0A$		-0.81	-1.0	V
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		465		pF
Output Capacitance	C_{oss}			150		pF
Reverse Transfer Capacitance	C_{rss}			40		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		5.5		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-6.5A$		13.6		nC
Total Gate Charge(4.5V)				6.7		nC
Gate-Source Charge	Q_{gs}			2.5		nC
Gate-Drain Charge	Q_{gd}			3.2		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-15V$ $V_{GS}=-10V$ $R_L=2.3\Omega$ $R_{GEN}=3\Omega$		8		ns
Turn-On Rise Time	t_r			6		ns
Turn-Off Delay Time	$t_{d(off)}$			17		ns
Turn-Off Fall Time	t_f			5		ns

P-Channel Electrical Characteristic Curve

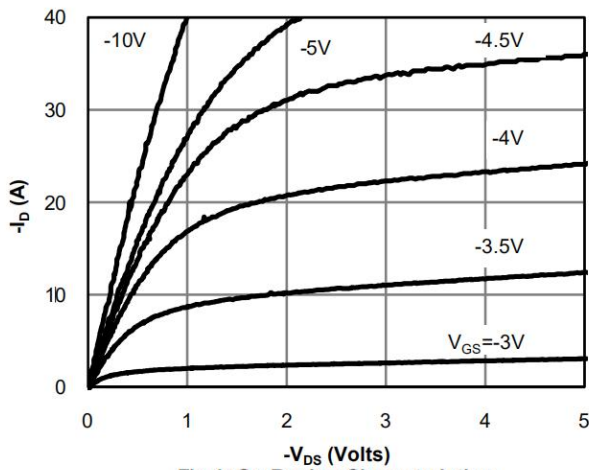


Fig 1: On-Region Characteristics

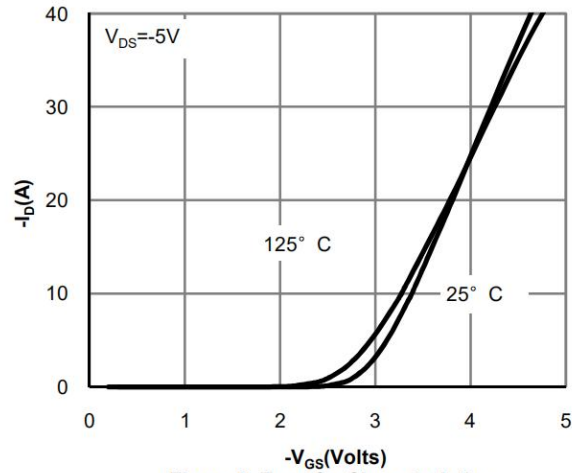


Figure 2: Transfer Characteristics

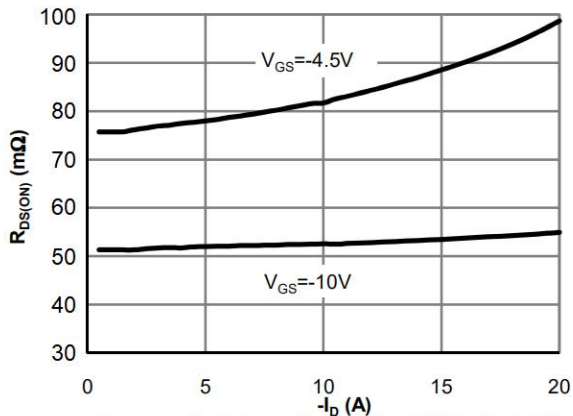


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

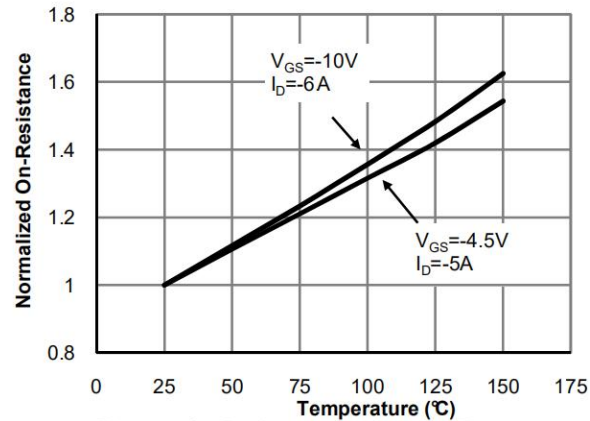


Figure 4: On-Resistance vs. Junction Temperature

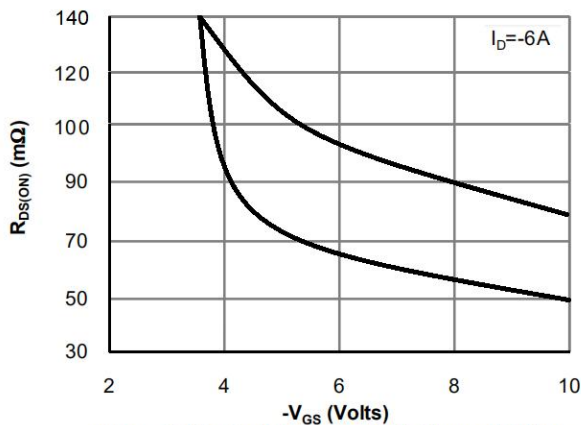


Figure 5: On-Resistance vs. Gate-Source Voltage

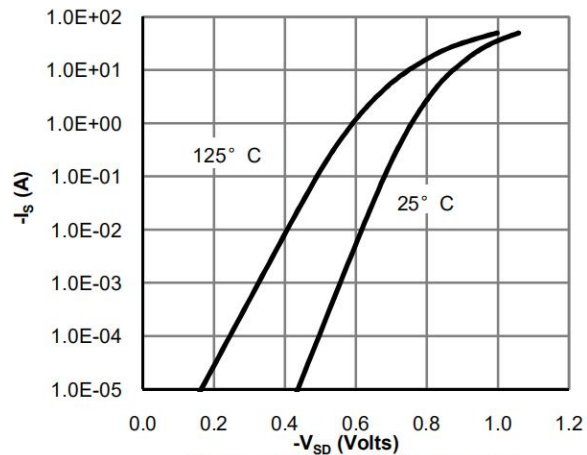
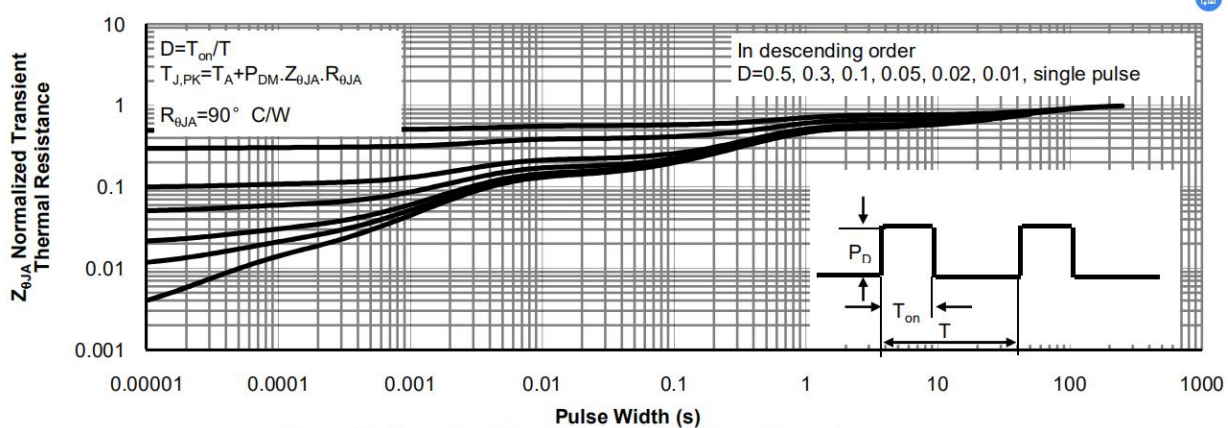
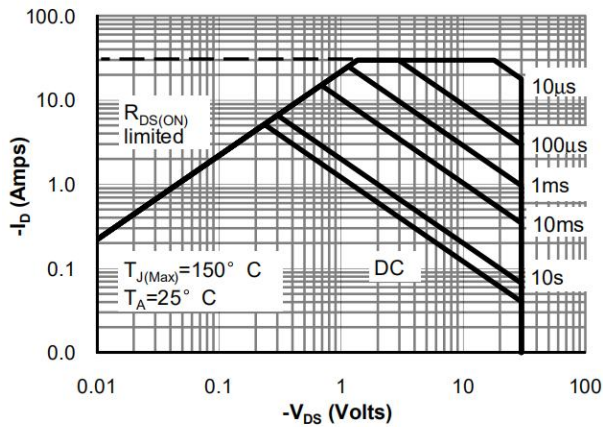
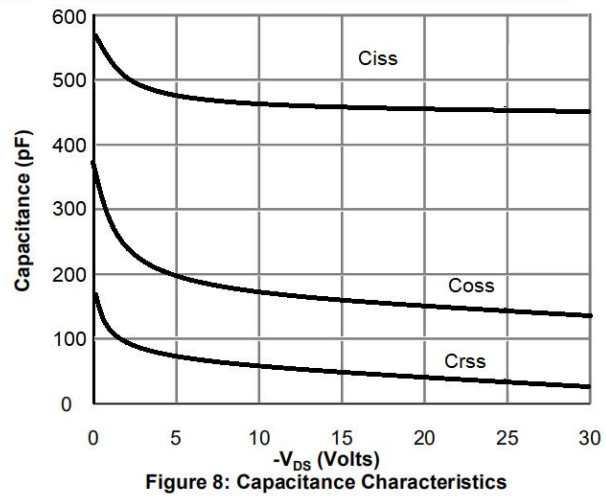
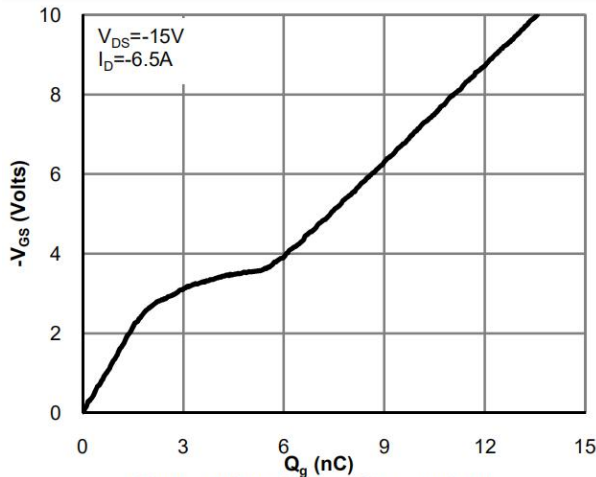
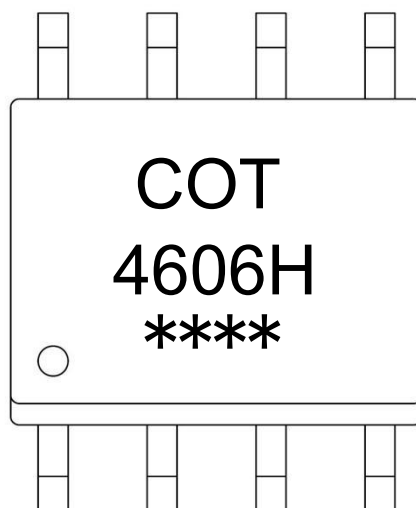


Figure 6: Body-Diode Characteristics

P-Channel Electrical Characteristic Curve



Marking Instructions



Note:

COT: Company Logo

4606H: Product Type.

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

Packaging SPEC.

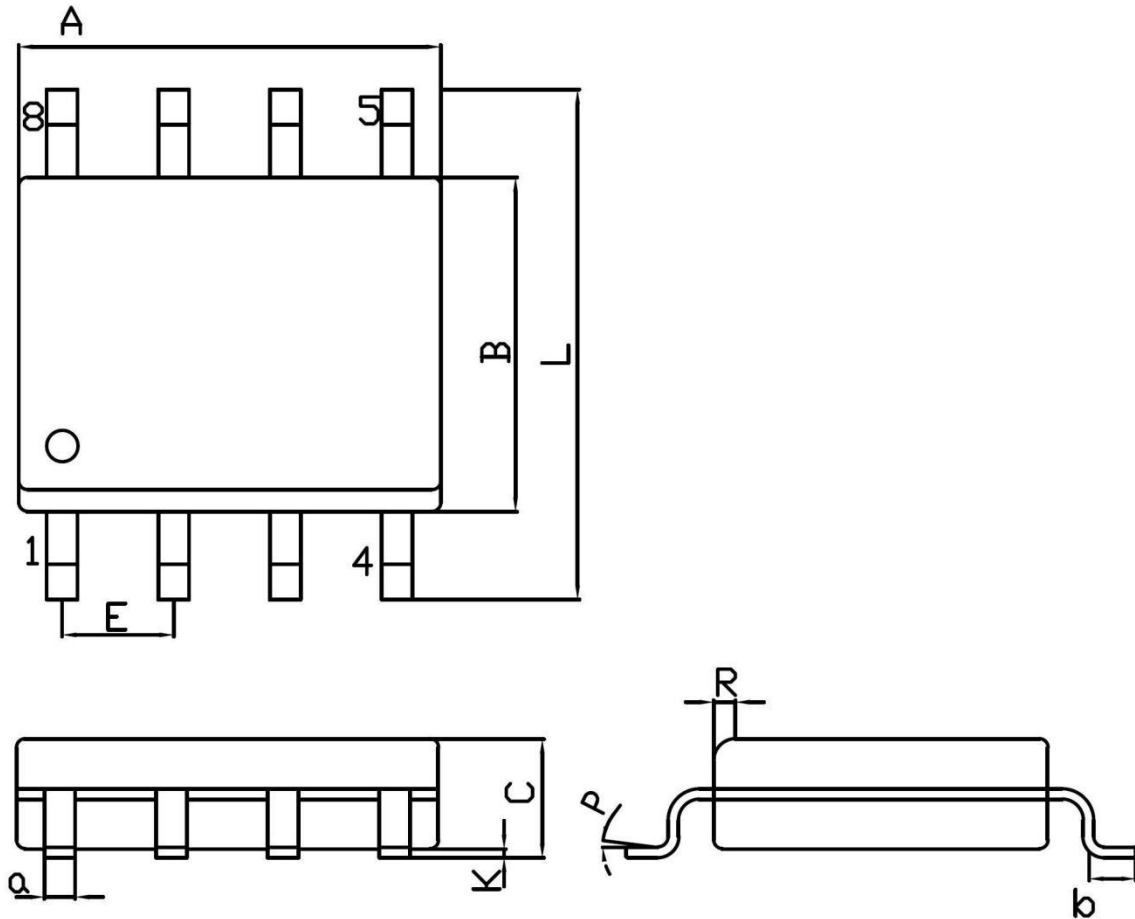
REEL INFORMATION

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