

Description

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

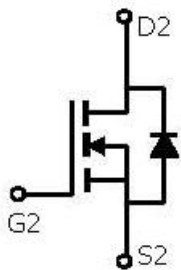
Applications

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.

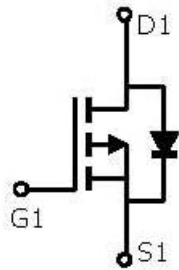
Features

- N-channel
- $V_{DS}(V)=30\text{V}$
- $I_D=6.9\text{A}$
- $R_{DS(ON)}<32\text{m}\Omega(V_{GS}=10\text{V})$
- $R_{DS(ON)}<36\text{m}\Omega(V_{GS}=4.5\text{V})$
- Halogen-free Product.
- P-channel
- $V_{DS}(V)=-30\text{V}$
- $I_D=-6\text{A}$
- $R_{DS(ON)}<65\text{m}\Omega(V_{GS}=-10\text{V})$
- $R_{DS(ON)}<75\text{m}\Omega(V_{GS}=-4.5\text{V})$

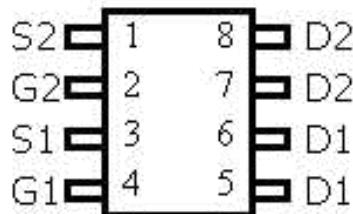
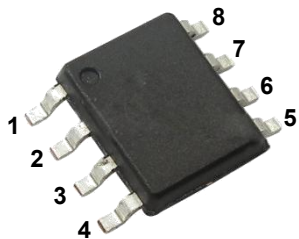
Equivalent Circuit & Pinning



n-channel



p-channel



Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating		Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DSS}	± 30		V
Gate-Source Voltage	V_{GSS}	± 12		V
Continuous Drain Current ^A	$I_D (T_A=25^\circ\text{C})$	6.9	-6.0	A
	$I_D (T_A=70^\circ\text{C})$	5.8	-5.0	A
Pulsed Drain Current ^B	I_{DM}	± 30		A
Power Dissipation	$P_D (T_A=25^\circ\text{C})$	2		W
	$P_D (T_A=70^\circ\text{C})$	1.44		W
Maximum Junction-to-Ambient ^A	$R_{\theta JA}(t \leq 10s)$	62.5		°C/W
	$R_{\theta JA}$	110		°C/W
Maximum Junction-to-Lead ^C	$R_{\theta JL}$	60	4	°C/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150		°C

Notes:

A: The value of $R_{\theta JA}$ 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 $t \leq 10s$ thermal resistance rating.

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.

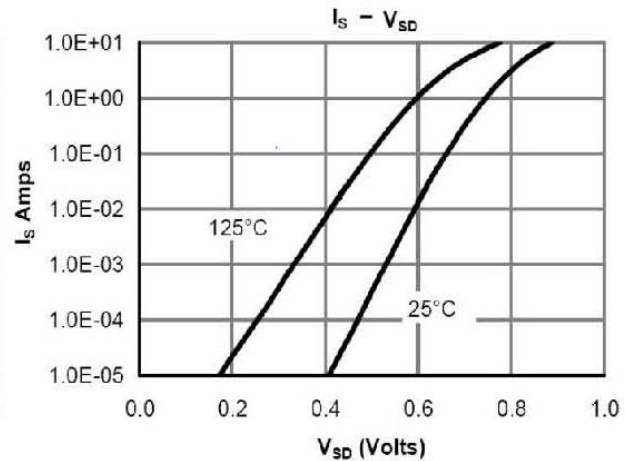
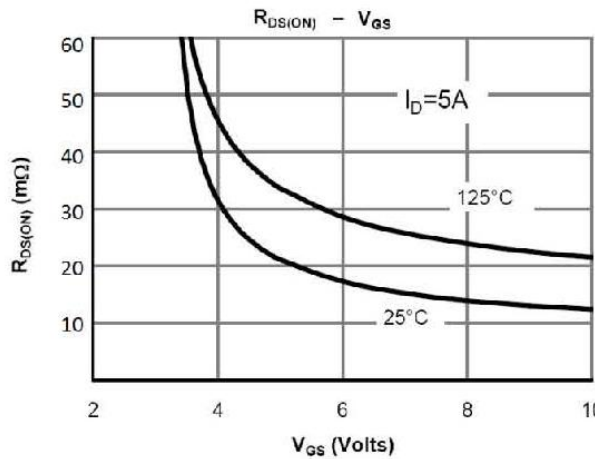
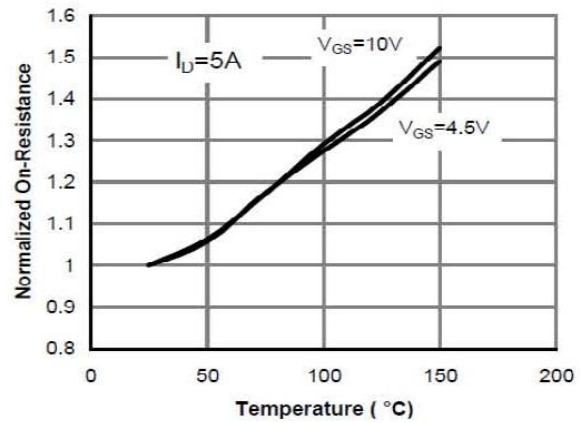
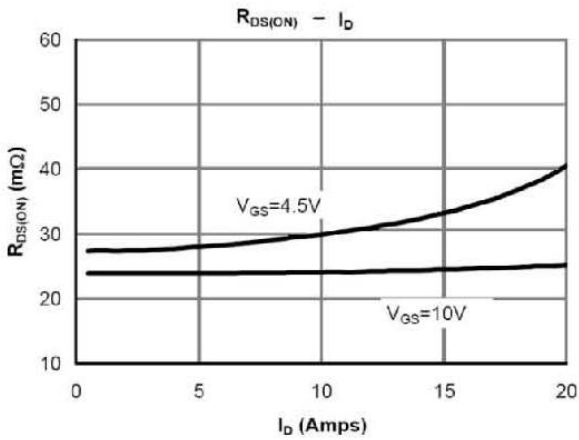
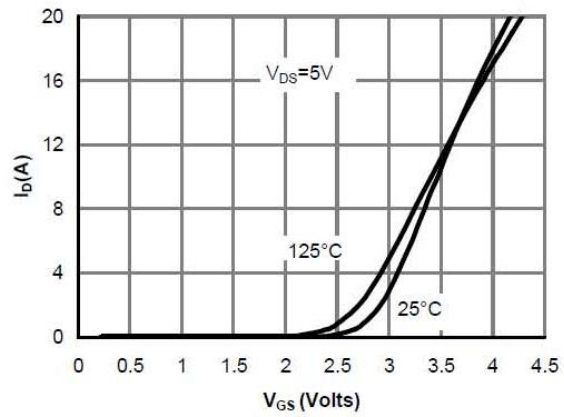
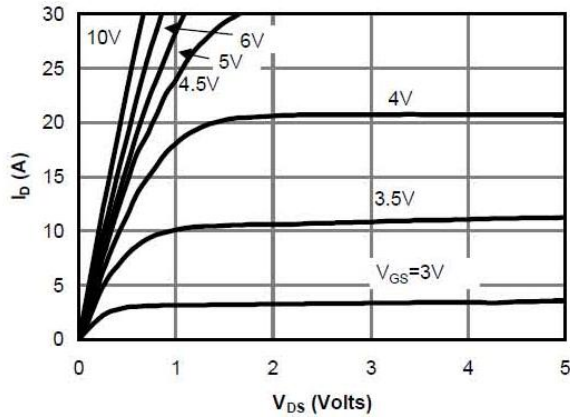
D: The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.

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.

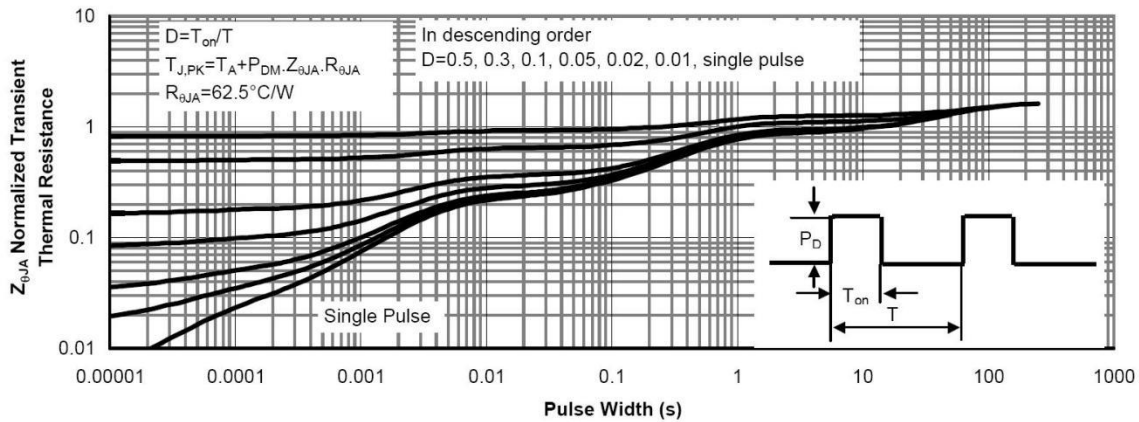
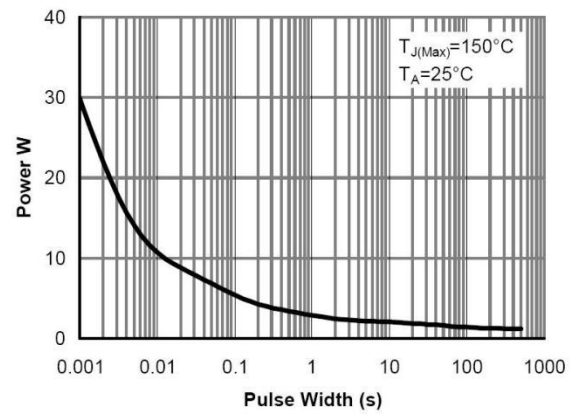
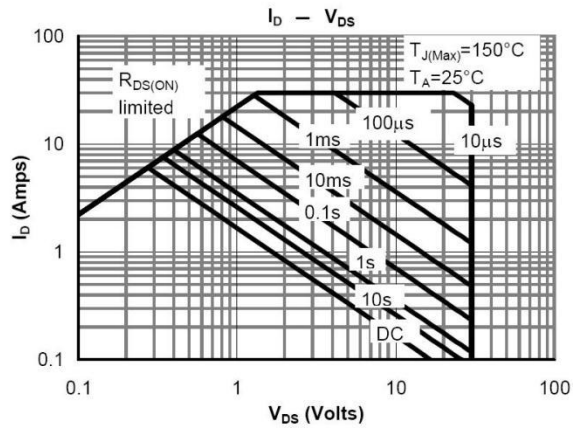
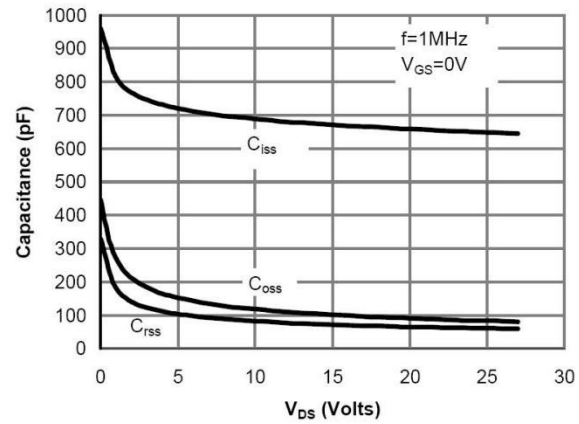
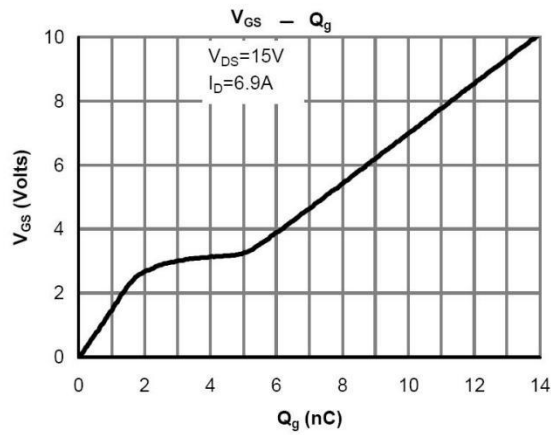
N-Channel Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=250\mu A$	30			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}	$V_{GS}=\pm 12V$ $V_{DS}=0V$			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	0.65		1.3	V
On state drain current	$I_{D(on)}$	$V_{DS}=4.5V$ $V_{GS}=5.0V$	6.9			A
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=6.9A$		24	32	m Ω
		$V_{GS}=10V$ $I_D=6.9A$ $T_J=125^\circ C$		32.3	38	m Ω
		$V_{GS}=4.5V$ $I_D=5.0A$		27	36	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5.0V$ $I_D=5.0A$		9		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=1.0A$		0.76	1.0	V
Input Capacitance	C_{iss}	$V_{DS}=15V$ $V_{GS}=0V$ $f=1.0MHz$		680		pF
Output Capacitance	C_{oss}			102		pF
Reverse Transfer Capacitance	C_{rss}			77		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		3.0		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=10V$ $V_{DS}=15V$ $I_D=6.9A$		13.84		nC
Total Gate Charge(4.5V)				6.74		nC
Gate-Source Charge	Q_{gs}			1.82		nC
Gate-Drain Charge	Q_{gd}			3.2		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=15V$ $V_{GS}=10V$ $R_L=2.1\Omega$ $R_{GEN}=3\Omega$		4.6		ns
Turn-On Rise Time	t_r			4.1		ns
Turn-Off Delay Time	$t_{d(off)}$			20.6		ns
Turn-Off Fall Time	t_f			5.2		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=6.9A$ $di/dt=100A/\mu s$		16.5		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=6.9A$ $di/dt=100A/\mu s$		7.8		nC

N-Channel Electrical Characteristic Curve



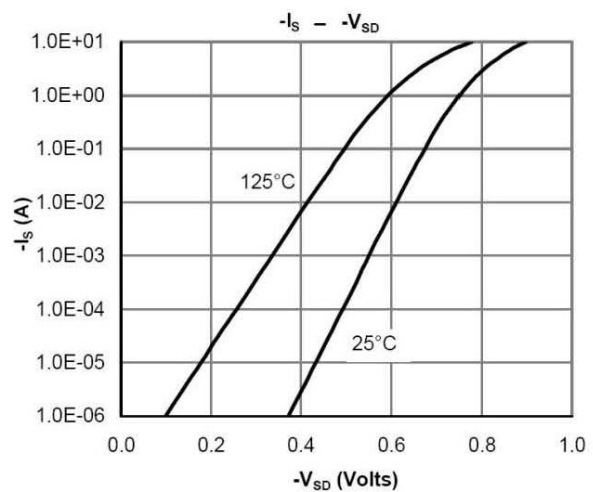
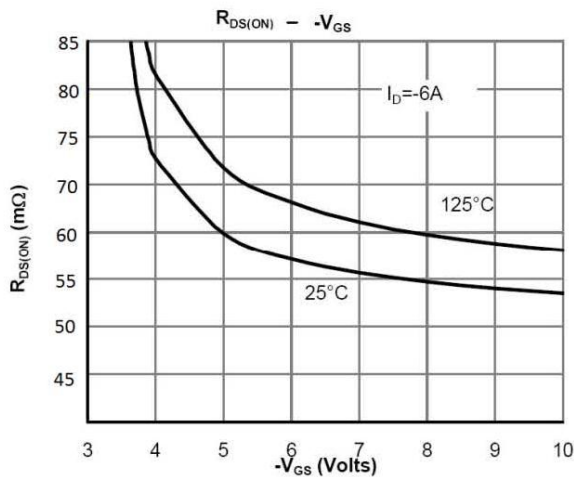
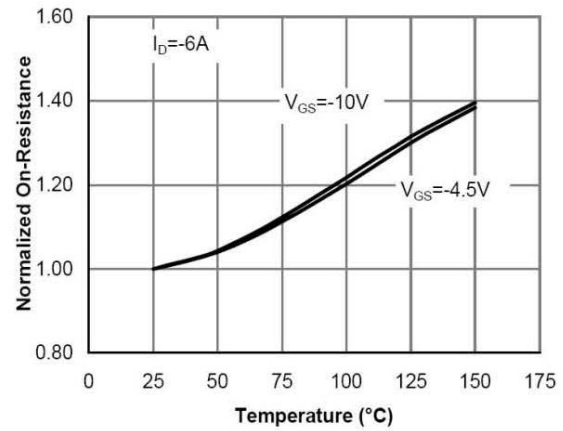
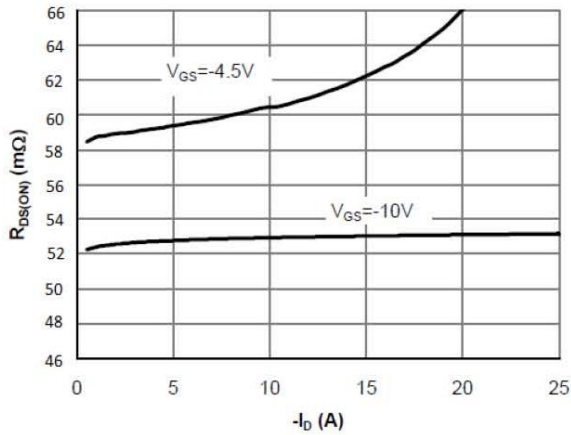
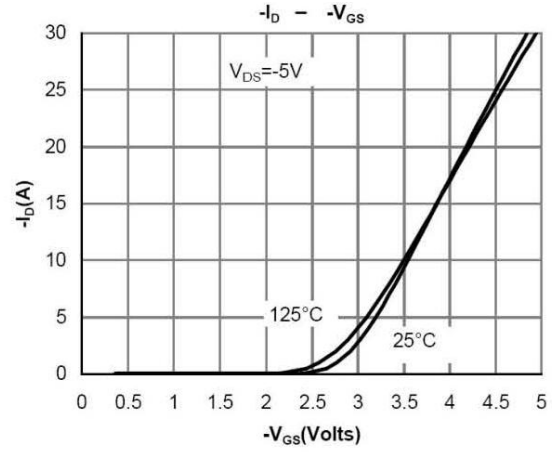
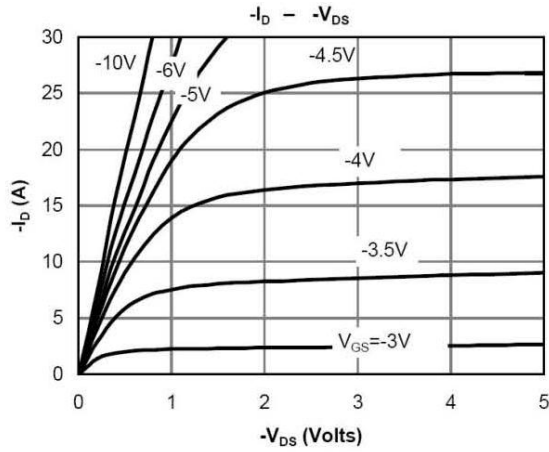
N-Channel Electrical Characteristic Curve



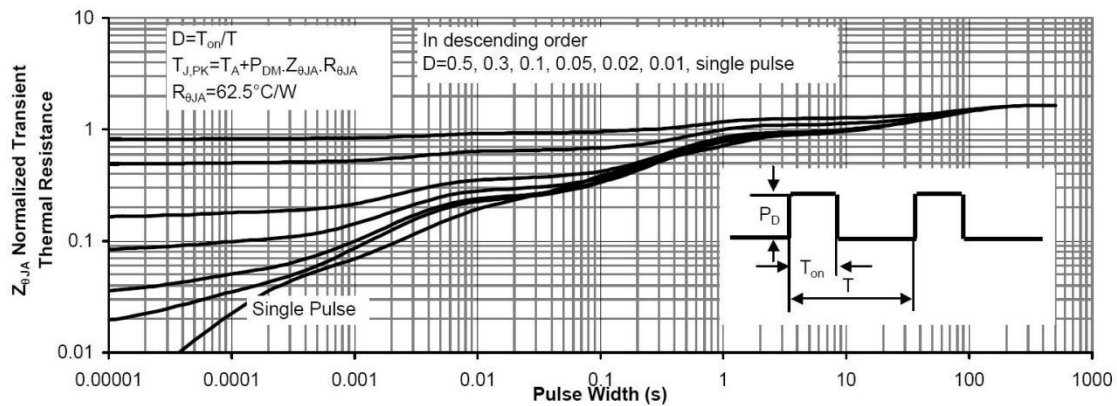
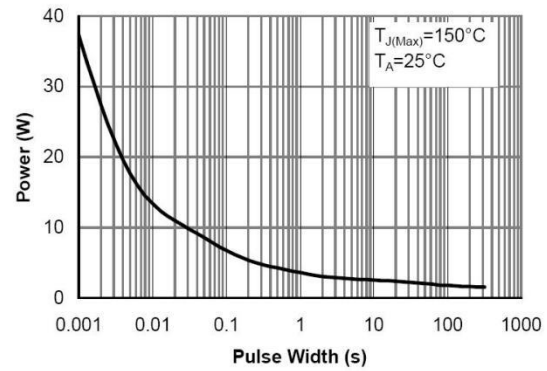
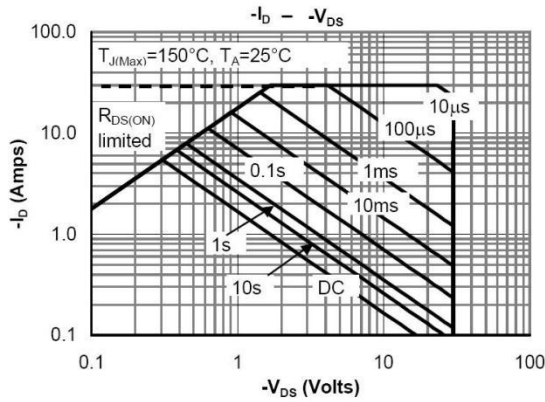
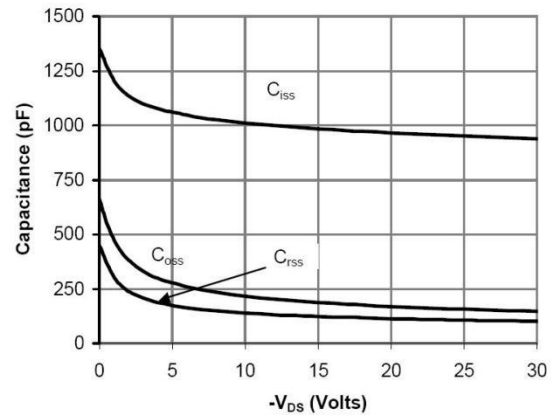
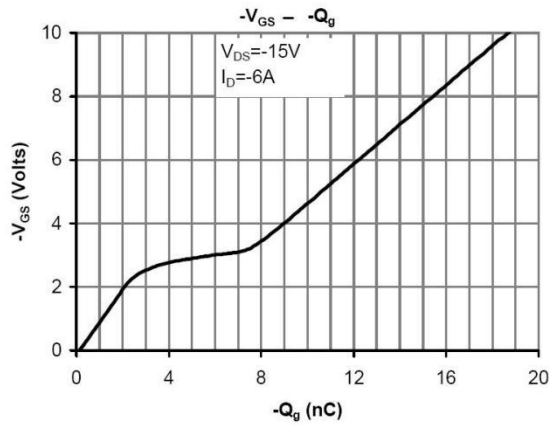
P-Channel Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-30			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}	$V_{GS}=\pm 12V$ $V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-0.5	-0.7	-1.3	V
On state drain current	$I_{D(on)}$	$V_{DS}=-4.5V$ $V_{GS}=-5.0V$	6			A
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-6.0A$		52	65	m Ω
		$V_{GS}=-10V$ $I_D=-6.0A$ $T_J=125^\circ C$		57	86	m Ω
		$V_{GS}=-4.5V$ $I_D=-5.0A$		59	75	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5.0V$ $I_D=-5.0A$		12		S
Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1.0A$		-0.76	-1.0	V
Input Capacitance	C_{iss}	$V_{DS}=-15V$ $V_{GS}=0V$ $f=1.0MHz$		920		pF
Output Capacitance	C_{oss}			190		pF
Reverse Transfer Capacitance	C_{rss}			122		pF
Gate resistance	R_g	$V_{DS}=0V$ $V_{GS}=0V$ $f=1.0MHz$		3.6		Ω
Total Gate Charge(10V)	Q_g	$V_{GS}=-10V$ $V_{DS}=-15V$ $I_D=-6.0A$		18.5		nC
Total Gate Charge(4.5V)				9.6		nC
Gate-Source Charge	Q_{gs}			2.7		nC
Gate-Drain Charge	Q_{gd}			4.5		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-15V$ $V_{GS}=-10V$ $R_L=2.7\Omega$ $R_{GEN}=3\Omega$		7.7		ns
Turn-On Rise Time	t_r			5.7		ns
Turn-Off Delay Time	$t_{d(off)}$			20.2		ns
Turn-Off Fall Time	t_f			9.5		ns
Body Diode Reverse Recovery Time	t_{rr}	$I_F=-6.0A$ $dI/dt=100A/\mu s$		20		ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=-6.0A$ $dI/dt=100A/\mu s$		8.8		nC

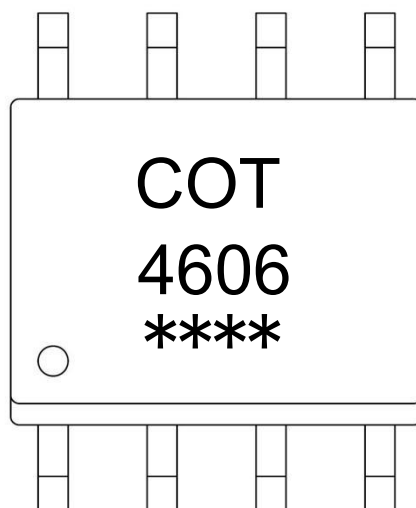
P-Channel Electrical Characteristic Curve



P-Channel Electrical Characteristic Curve



Marking Instructions



Note:

COT: Company Logo

4606: Product Type.

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

Packaging SPEC.

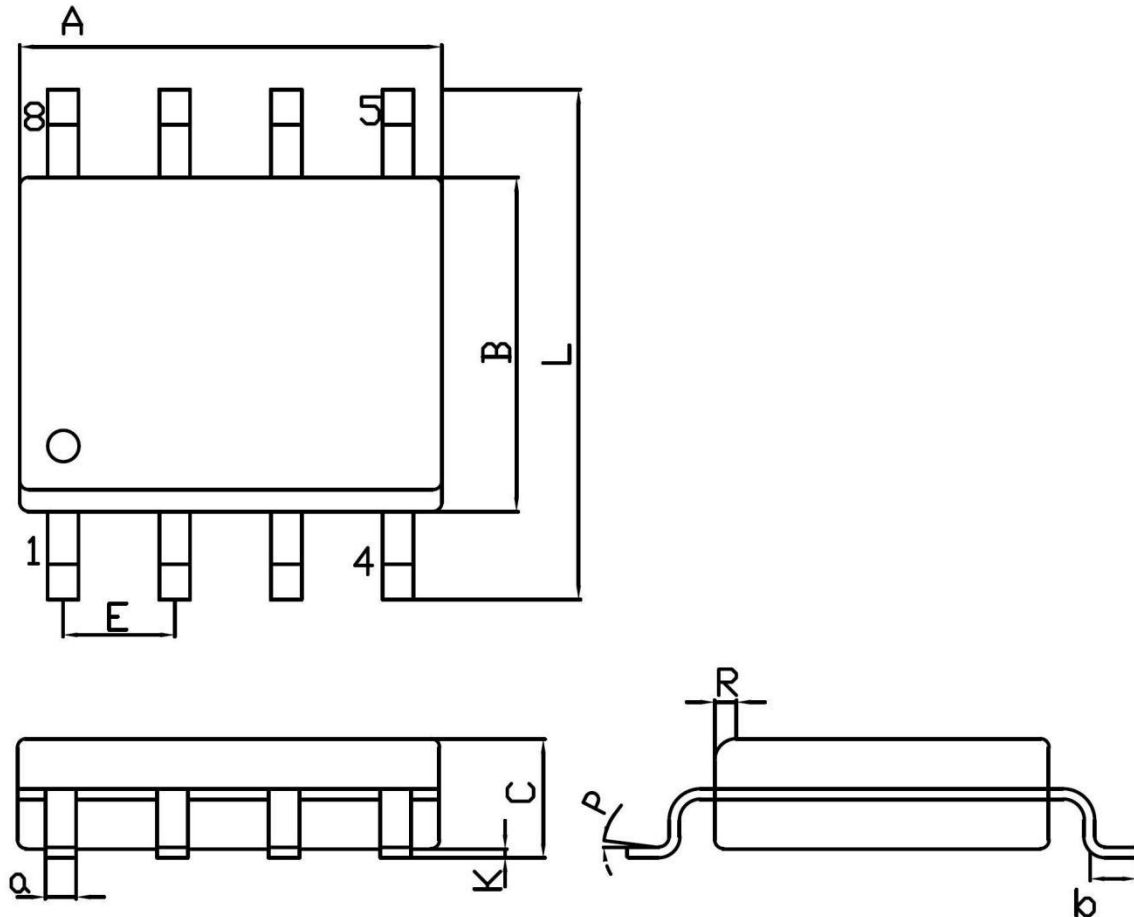
REEL INFORMATION

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