



UD4606

Power MOSFET

**DUAL ENHANCEMENT MODE
(N-CHANNEL/P-CHANNEL)**

■ **DESCRIPTION**

The UTC **UD4606** provides excellent $R_{DS(ON)}$ and low gate charge by using advanced trench technology MOSFETs. The complementary MOSFETs may help to form a level shifted high side switch and also for lots of other applications.

■ **FEATURES**

* N-Channel: 30V/6.9A

$R_{DS(ON)} \leq 28 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=6.9\text{A}$

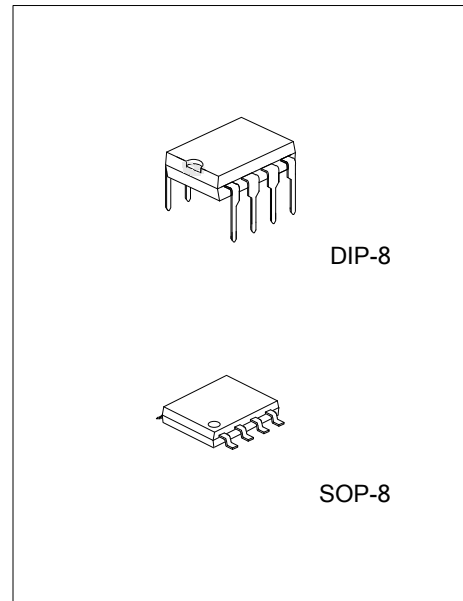
$R_{DS(ON)} \leq 42 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=5.0\text{A}$

* P-Channel: -30V/-6.0A

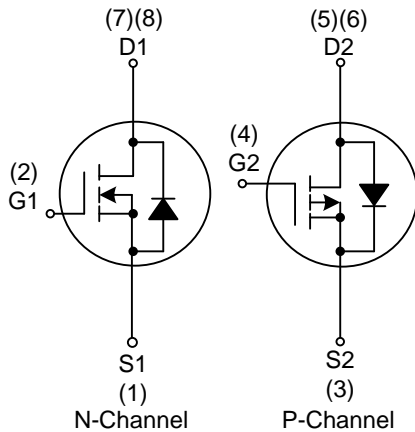
$R_{DS(ON)} \leq 35 \text{ m}\Omega$ @ $V_{GS}=-10\text{V}$, $I_D=-6.0\text{A}$

$R_{DS(ON)} \leq 58 \text{ m}\Omega$ @ $V_{GS}=-4.5\text{V}$, $I_D=-5.0\text{A}$

* Reliable and rugged



■ **SYMBOL**



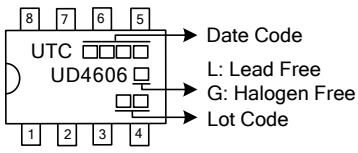
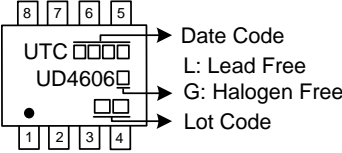
■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UD4606L-D08-T	UD4606G-D08-T	DIP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tube
UD4606L-S08-R	UD4606G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

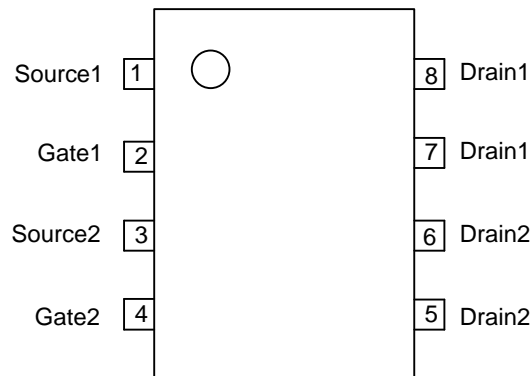
Note: Pin Assignment: G: Gate D: Drain S: Source

<p>UD4606G-D08-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) D08: DIP-8, S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

DIP-8	SOP-8
 <p>8 7 6 5 → Date Code UTC □□□□ UD4606 □ L: Lead Free G: Halogen Free 1 2 3 4 → Lot Code</p>	 <p>8 7 6 5 → Date Code UTC □□□□ UD4606 □ L: Lead Free G: Halogen Free 1 2 3 4 → Lot Code</p>

PIN CONFIGURATION



■ **ABSOLUTE MAXIMUM RATINGS** ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS		UNIT	
		N-CHANNEL	P-CHANNEL		
Drain to Source Voltage	V_{DSS}	30	-30	V	
Gate to Source Voltage	V_{GSS}	± 20	± 20		
Drain Current (Note 3)	Continuous	I_D	6.9	A	
Drain Current (Note 1)	Pulsed	I_{DM}	30		
Power Dissipation @ $T_A=25^\circ\text{C}$	DIP-8	P_D	2.5		W
	SOP-8		2		
Junction Temperature	T_J	-55 ~ +150		$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 ~ +150		$^\circ\text{C}$	

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$

■ **THERMAL DATA**

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction to Ambient	DIP-8	θ_{JA}	74	110	$^\circ\text{C/W}$
	SOP-8		67	80	$^\circ\text{C/W}$

Note: Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$.

■ **ELECTRICAL CHARACTERISTICS** ($T_A=25^\circ\text{C}$, unless otherwise specified)

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=24\text{V}, V_{GS}=0\text{V}$			1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1	1.9	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=6.9\text{A}$		17	28	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}, I_D=5.0\text{A}$		26	42	$\text{m}\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0\text{V}, V_{DS}=15\text{V}, f=1.0\text{MHz}$		380		pF
Output Capacitance	C_{OSS}			108		pF
Reverse Transfer Capacitance	C_{RSS}			94		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note2)	Q_G	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=6.9\text{A}$		13.8		nC
Gate-Source Charge	Q_{GS}			2.2		nC
Gate-Drain Charge	Q_{GD}			4		nC
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	$V_{DS}=15\text{V}, V_{GS}=10\text{V}, R_G=3\Omega, I_D=6.9\text{A}$		4.6		ns
Turn-ON Rise Time	t_R			16		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			14		ns
Turn-OFF Fall Time	t_F			22		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Continuous Forward Current (Note3)	I_S				3	A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=1.0\text{A}, V_{GS}=0\text{V}$		0.76	1	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

P-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-2	-2.4	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-6.0A$		32	35	m Ω
		$V_{GS}=-4.5V, I_D=-5.0A$		52	58	m Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=-15V, f=1.0MHz$		1082		pF
Output Capacitance	C_{OSS}			190		pF
Reverse Transfer Capacitance	C_{RSS}			162		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note2)	Q_G	$V_{DS}=-15V, V_{GS}=-10V, I_D=-6A$		24		nC
Gate-Source Charge	Q_{GS}			4		nC
Gate-Drain Charge	Q_{GD}			7		nC
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	$V_{DS}=-15V, V_{GS}=-10V, I_D=-6A$ $R_G=3\Omega$		7.7		ns
Turn-ON Rise Time	t_R			16.6		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			24.8		ns
Turn-OFF Fall Time	t_F			20.4		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Continuous Forward Current (Note3)	I_S				-4.2	A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=-1A, V_{GS}=0V$		-0.76	-1	V

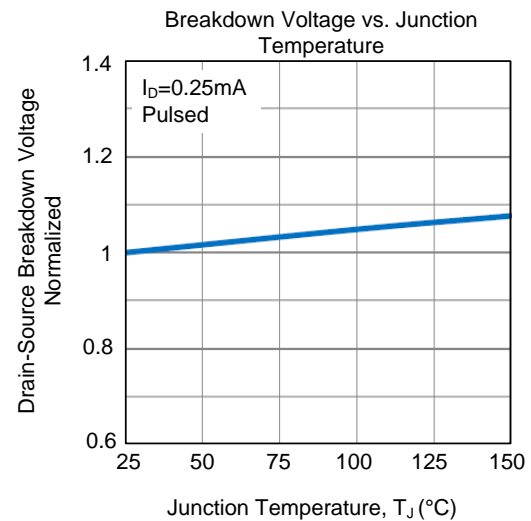
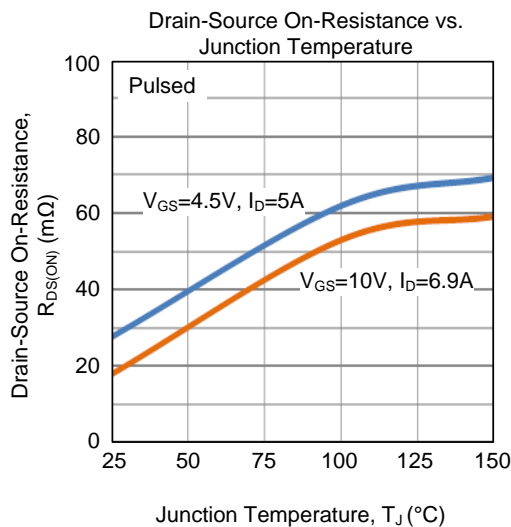
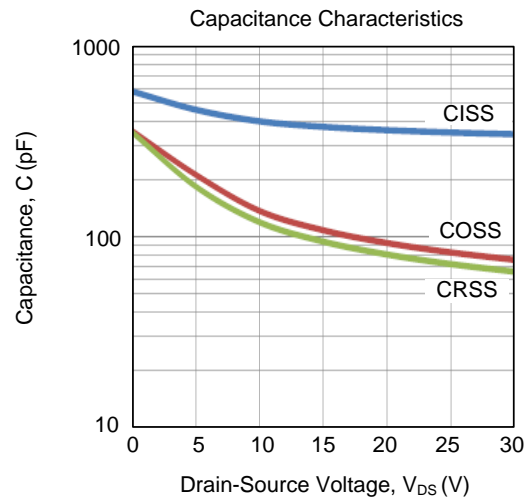
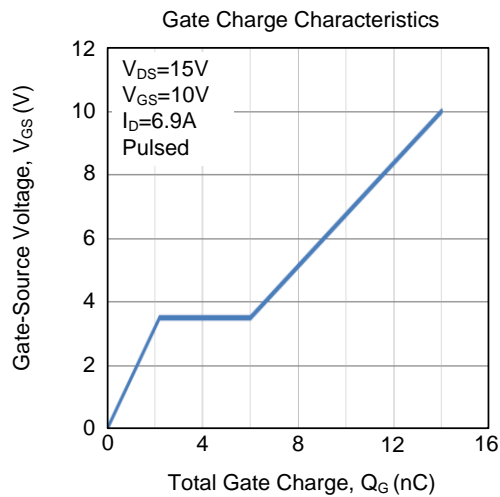
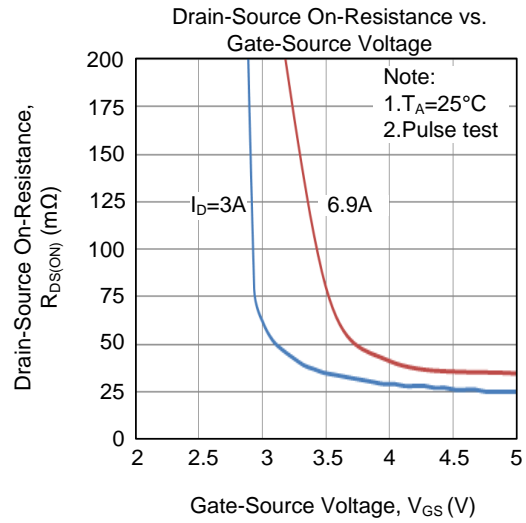
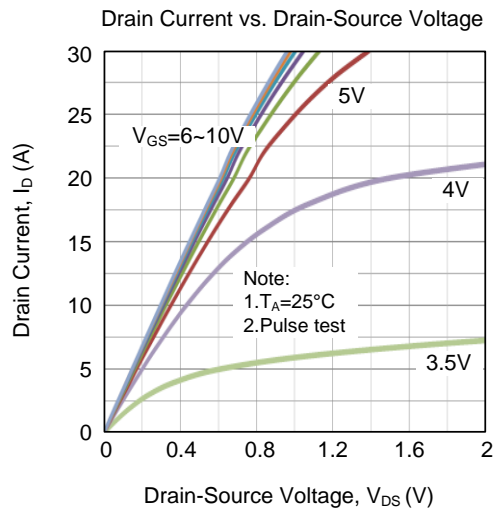
Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

3. Surface Mounted on 1in² pad area, $t \leq 10sec$.

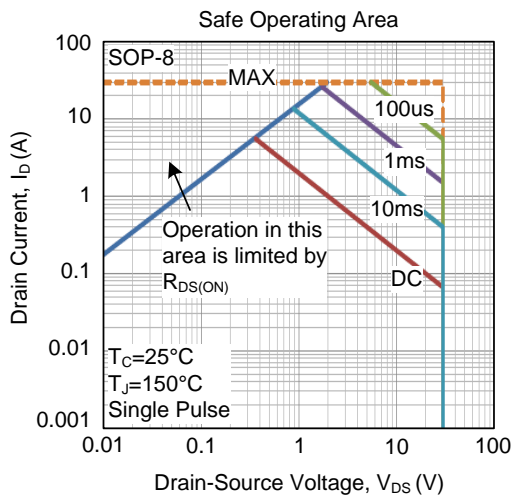
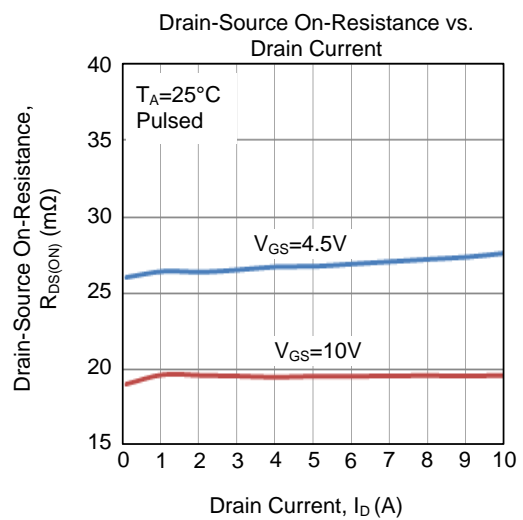
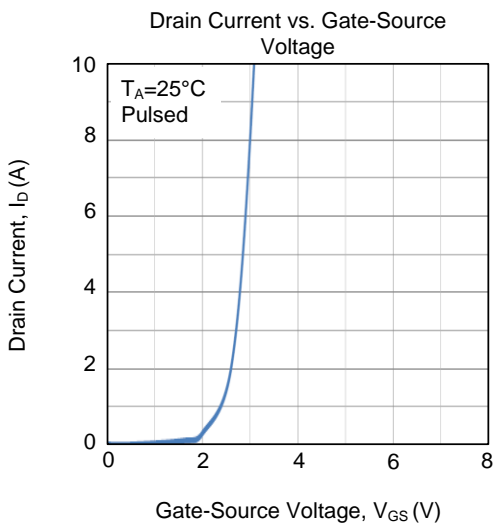
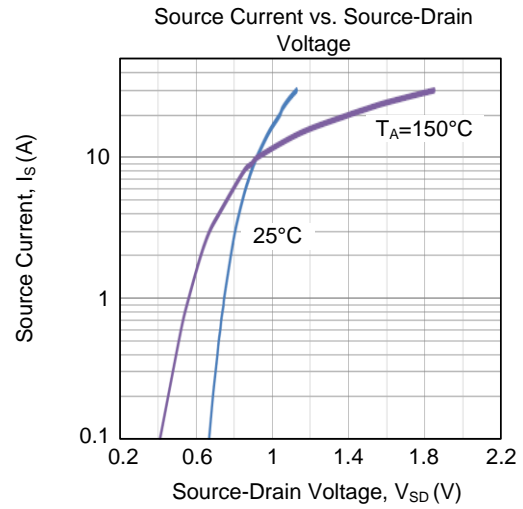
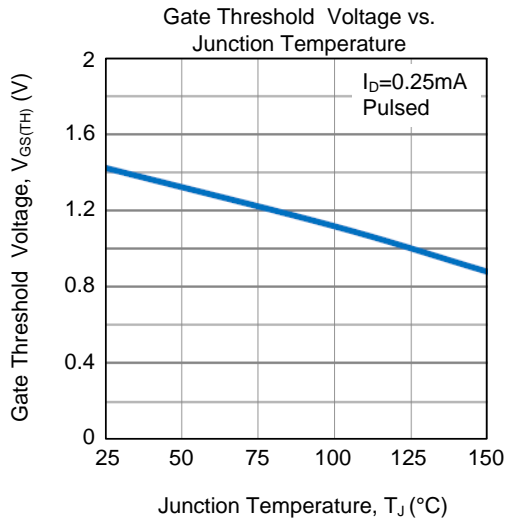
■ TYPICAL CHARACTERISTICS

N-CHANNEL



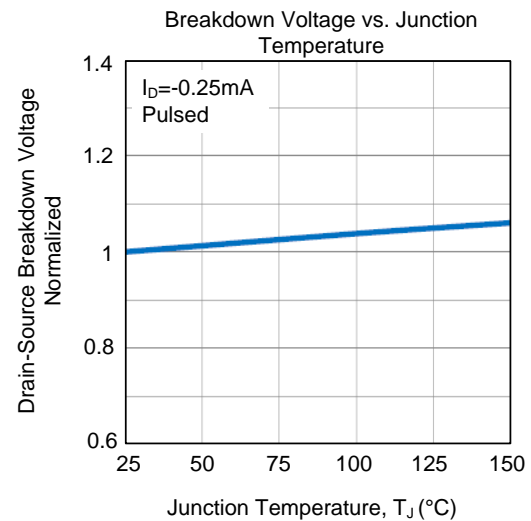
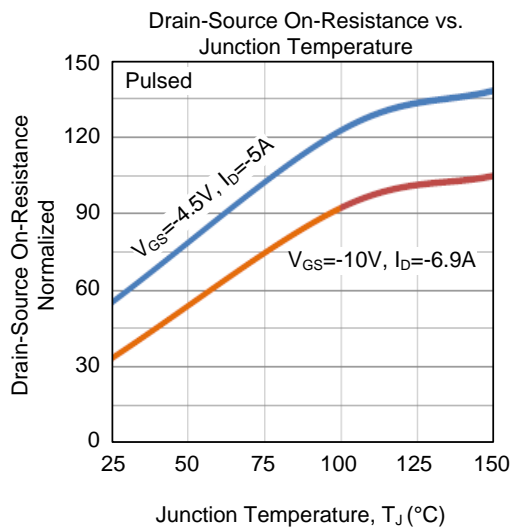
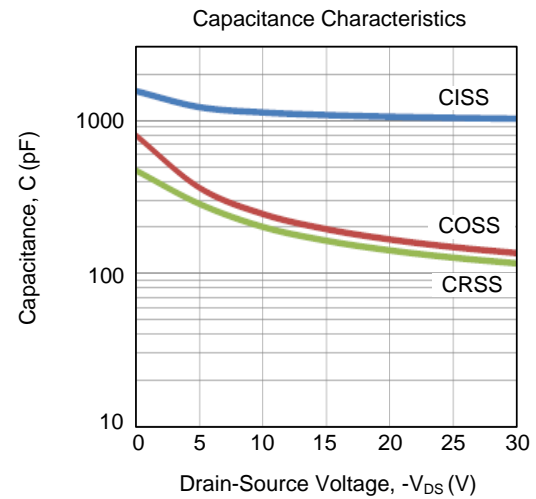
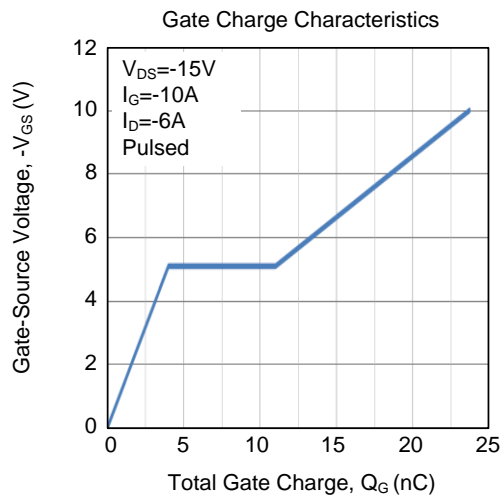
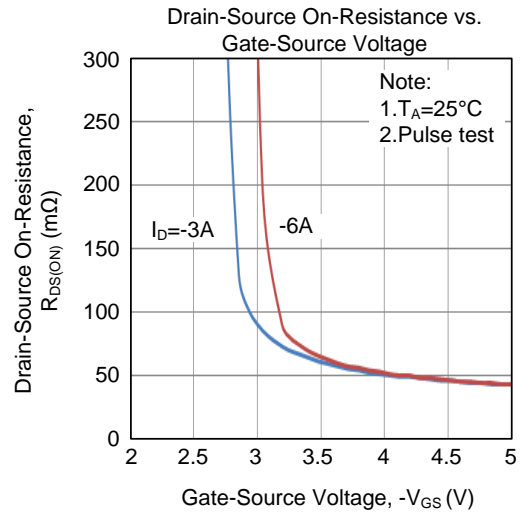
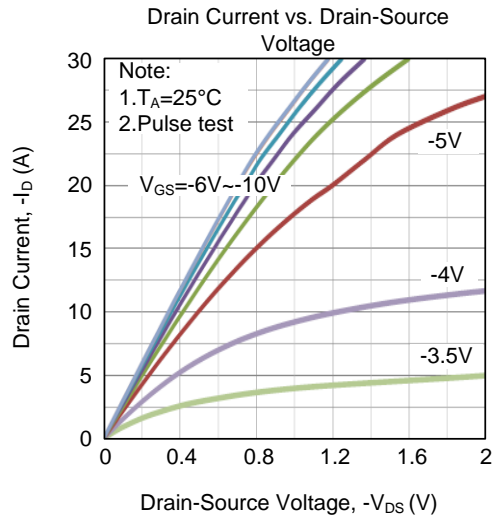
■ TYPICAL CHARACTERISTICS (Cont.)

N-CHANNEL



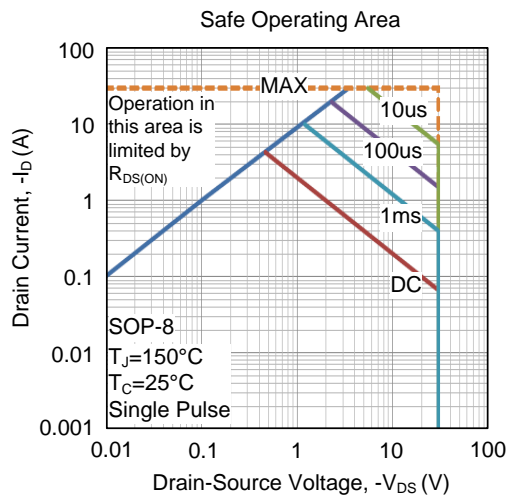
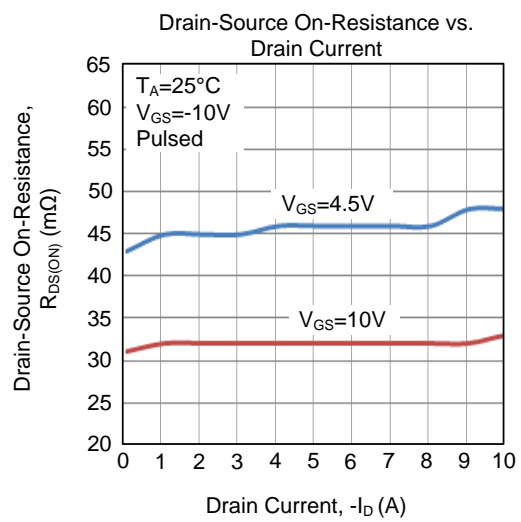
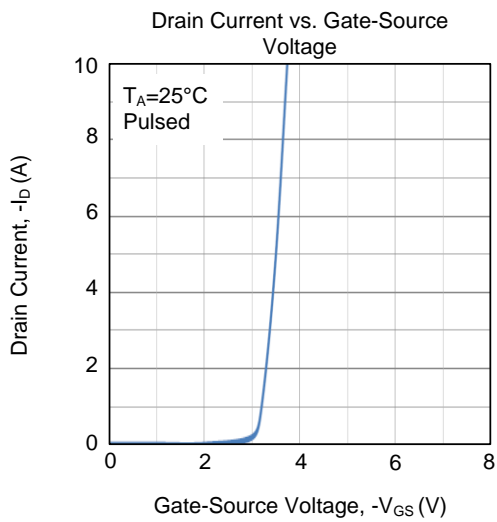
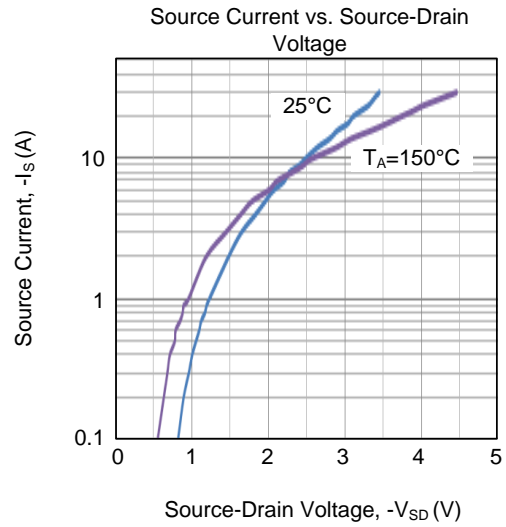
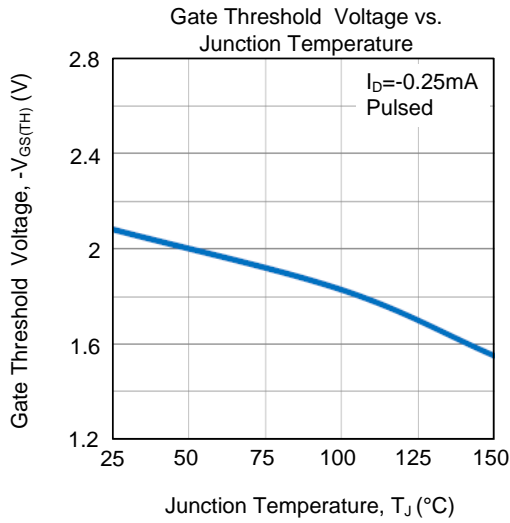
■ TYPICAL CHARACTERISTICS (Cont.)

P-CHANNEL

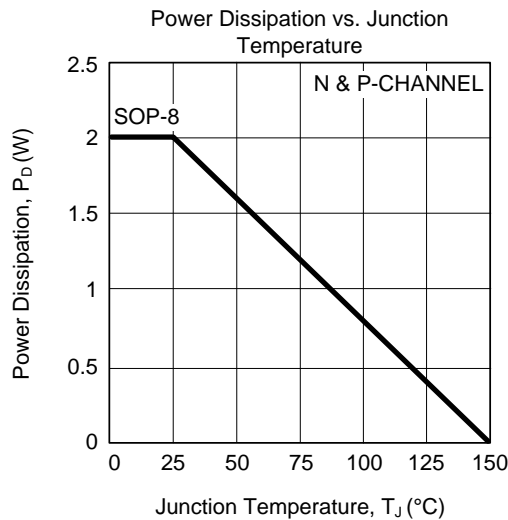
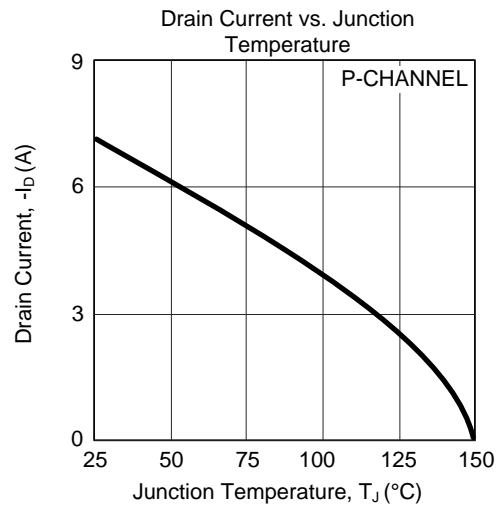
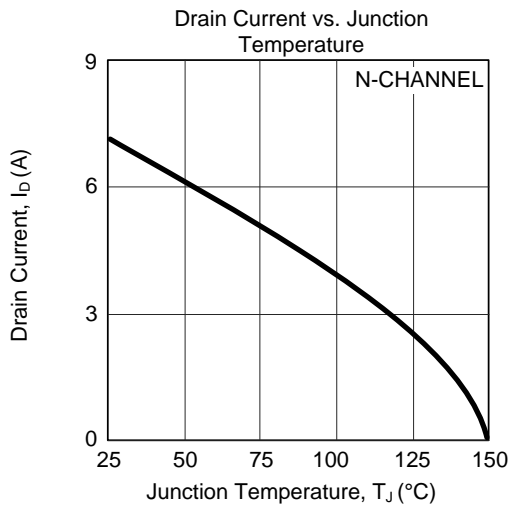


■ TYPICAL CHARACTERISTICS (Cont.)

P-CHANNEL



■ TYPICAL CHARACTERISTICS (Cont.)



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