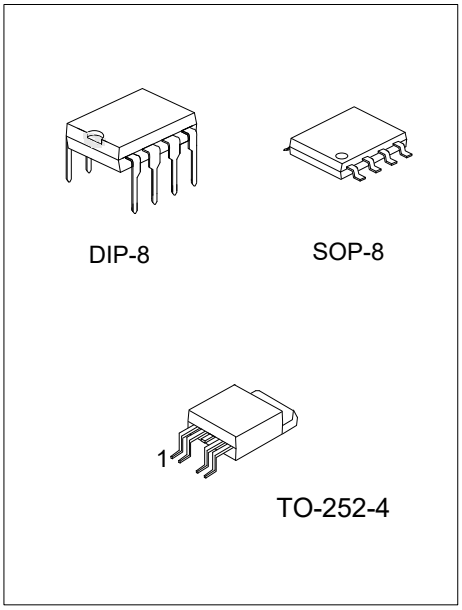
UD4606

Power MOSFET

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



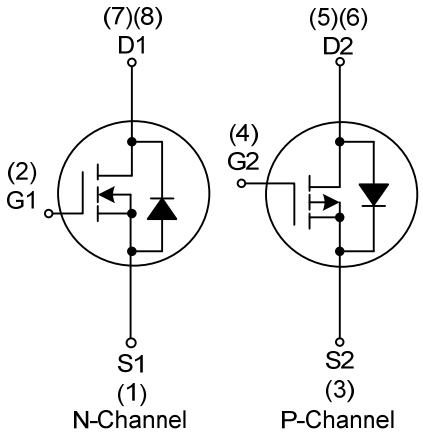
■ DESCRIPTION

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

■ FEATURES

* N-Channel: 30V/6.9A
  $R_{DS(ON)}$ ≤ 28 mΩ @ V_{GS}=10V, I_D=6.9A
  $R_{DS(ON)}$ ≤ 42 mΩ @ V_{GS}=4.5V, I_D=5.0A
* P-Channel: -30V/-6.0A
  $R_{DS(ON)}$ ≤ 35 mΩ @ V_{GS}=-10V, I_D=-6.0A
  $R_{DS(ON)}$ ≤ 58 mΩ @ V_{GS}=-4.5V, I_D=-5.0A
* Reliable and rugged

■ SYMBOL



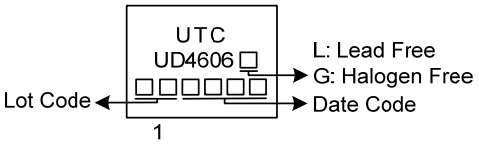
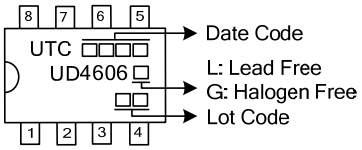
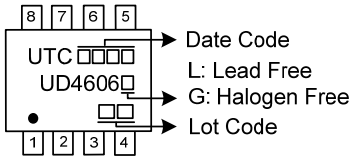
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UD4606L-TN4-R	UD4606G-TN4-R	TO-252-4	S1	G1	D	S2	G2	-	-	-	Tape Reel
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

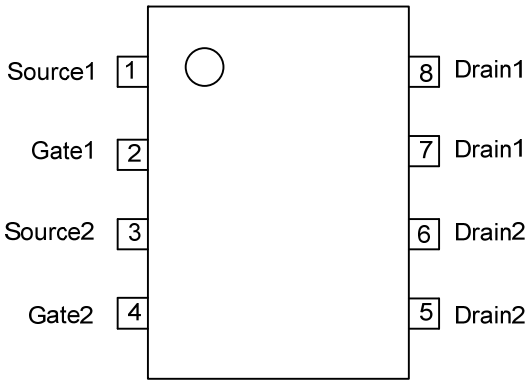
Note: Pin Assignment: G: Gate D: Drain S: Source

UD4606G-TN4-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel, T: Tube (2) TN4: TO-252-4, D08: DIP-8, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
TO-252-4	
DIP-8	
SOP-8	

■ PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATINGS (T_C=25°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	-6	A
Drain Current (Note 1)	Pulsed	I_{DM}	30	-30	
Power Dissipation @T_A=25°C	TO-252-4	P_D	1.14		W
	DIP-8		1.19		W
	SOP-8		1.39		W
Junction Temperature		T_J	-55 ~ +150		°C
Storage Temperature Range		T_{STG}	-55 ~ +150		°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≤10sec

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252-4	θ_{JA}	50	°C/W
	DIP-8		105	°C/W
	SOP-8		90	°C/W

Note: Surface Mounted on 1in^2 pad area, t≤10sec.

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			1	uA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	1.0	1.9	3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6.9A		17	28	mΩ
		V_{GS}=4.5V, I_D=5.0A		26	42	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=15V, f=1.0MHz		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}=15V, V_{GS}=10V, I_D=6.9A		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}=15V, V_{GS}=10V, I_D=6.9A, R_G=3Ω		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=1.0A, V_{GS}=0V		0.76	1	V

■ ELECTRICAL CHARACTERISTICS (Cont.)

P-CHANNEL

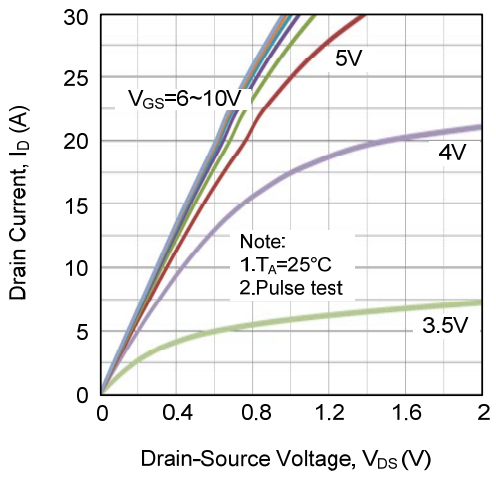
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250uA	-1.2	-2	-2.4	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6.0A		32	35	mΩ
		V_{GS}=-4.5V, I_D=-5.0A		52	58	mΩ
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=3Ω		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 ≤ 300μs, duty cycle ≤ 2%.
3. Surface Mounted on 1in^2 pad area, t ≤ 10sec.

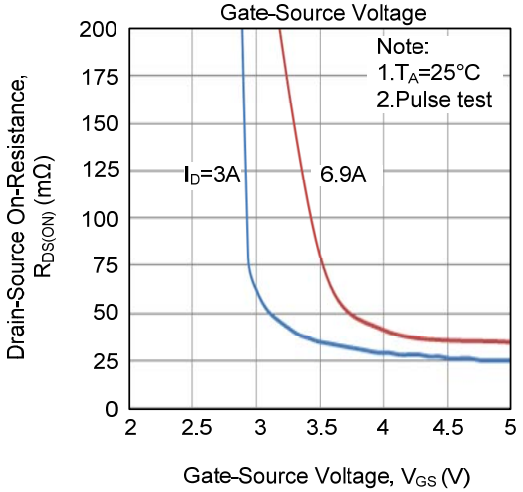
■ TYPICAL CHARACTERISTICS

N-CHANNEL

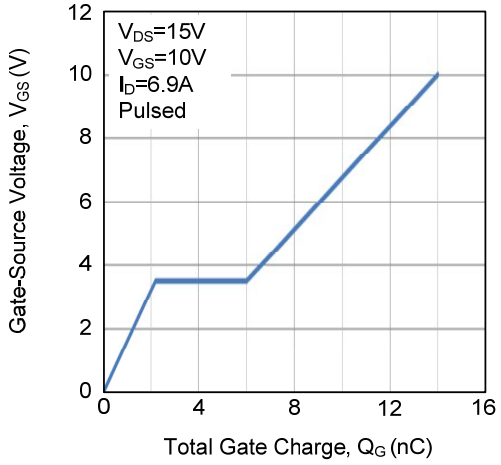
Drain Current vs. Drain-Source Voltage



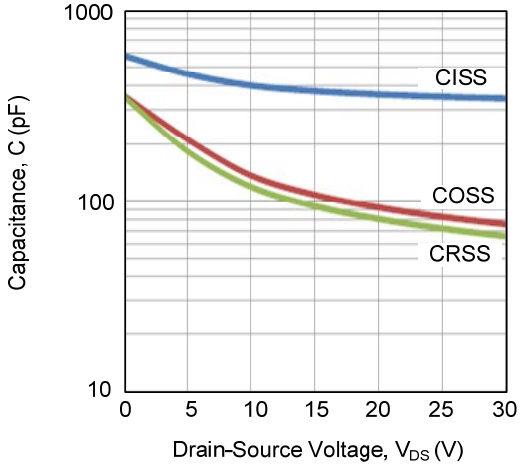
Drain-Source On-Resistance vs. Gate-Source Voltage



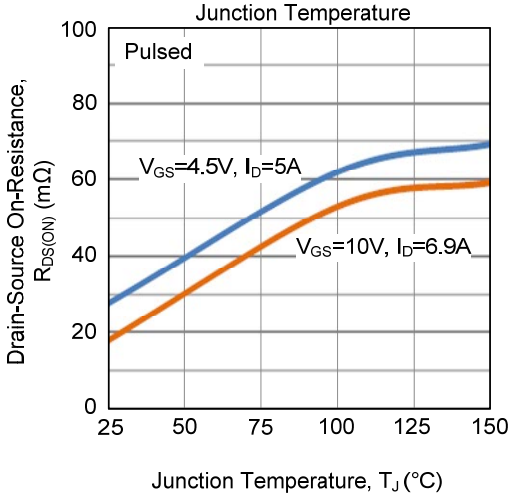
Gate Charge Characteristics



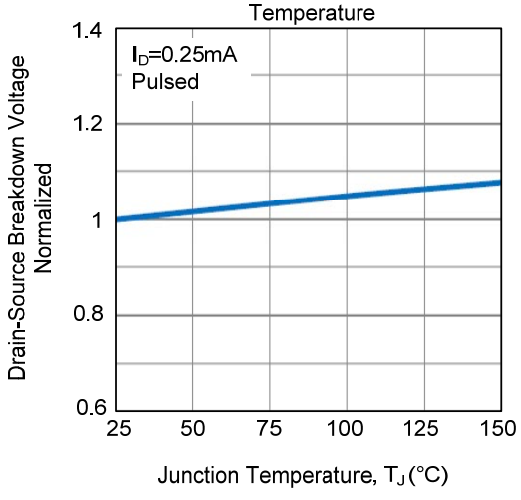
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

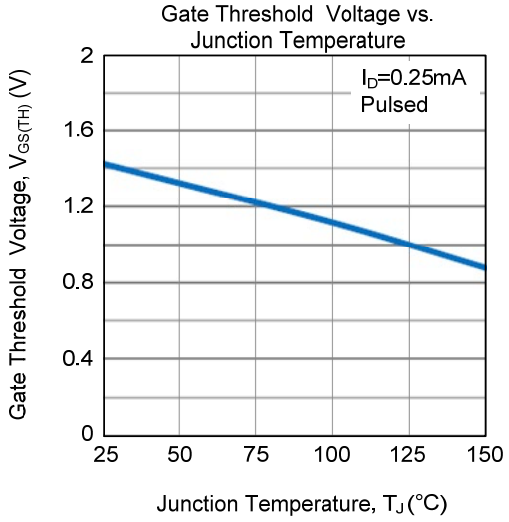


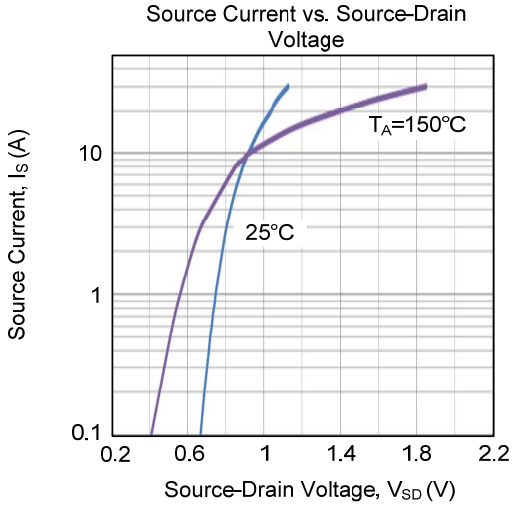
Breakdown Voltage vs. Junction Temperature

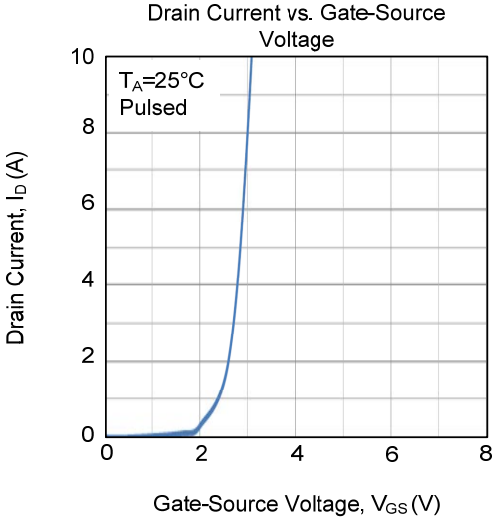


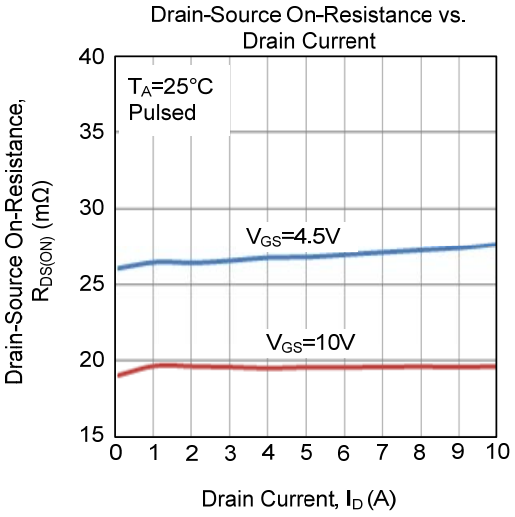
■ TYPICAL CHARACTERISTICS (Cont.)

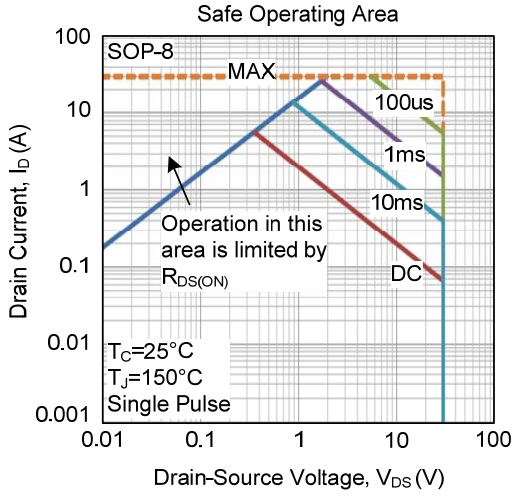
N-CHANNEL







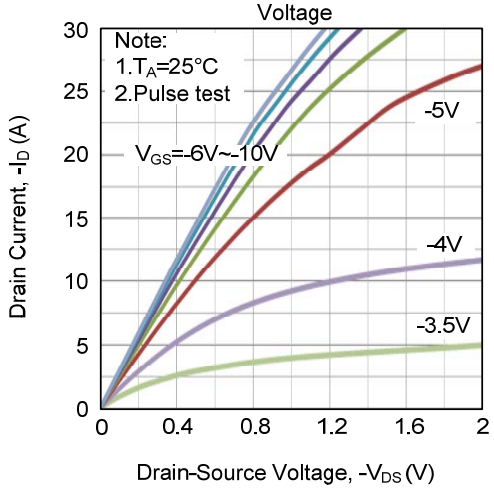




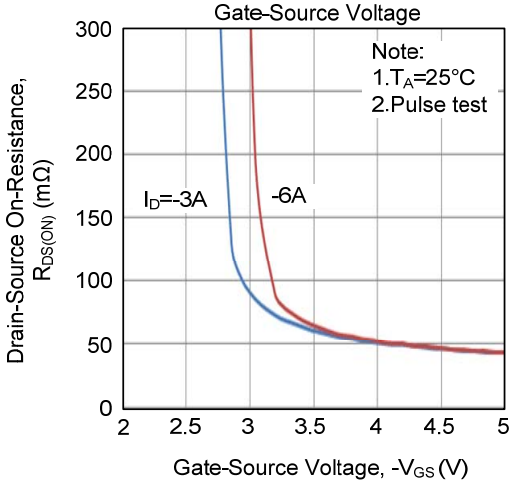
■ TYPICAL CHARACTERISTICS (Cont.)

P-CHANNEL

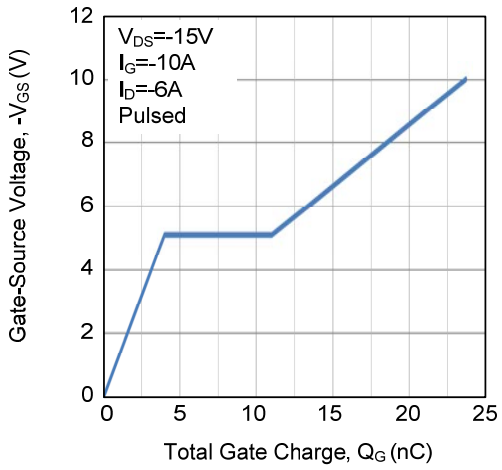
Drain Current vs. Drain-Source Voltage



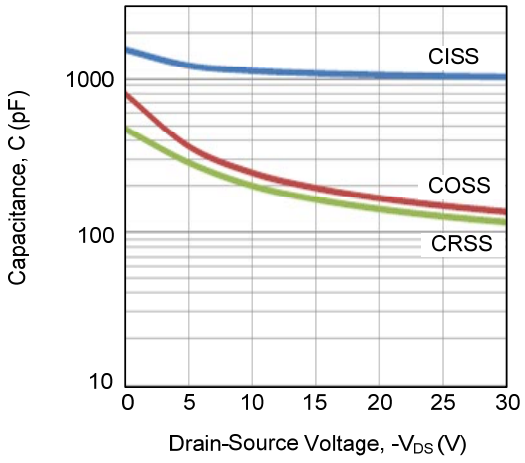
Drain-Source On-Resistance vs. Gate-Source Voltage



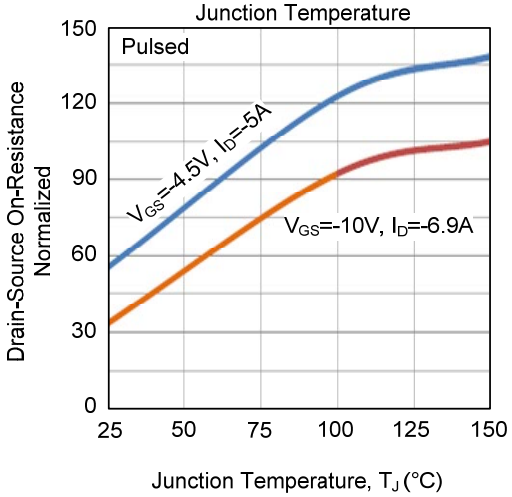
Gate Charge Characteristics



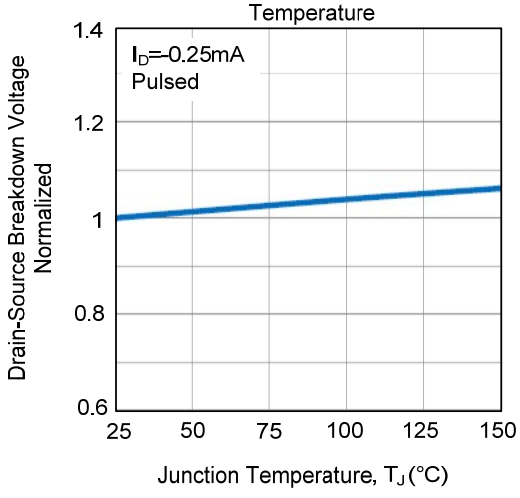
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature



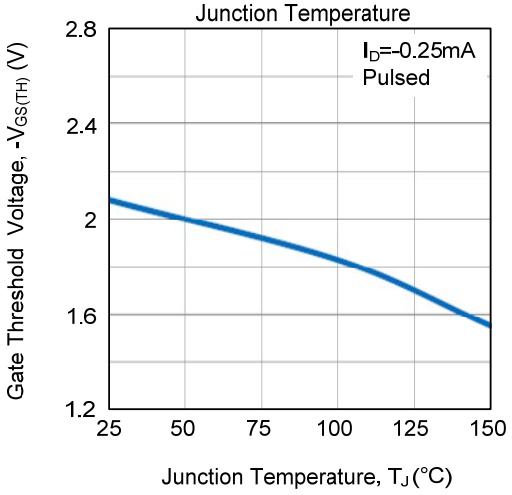
Breakdown Voltage vs. Junction Temperature



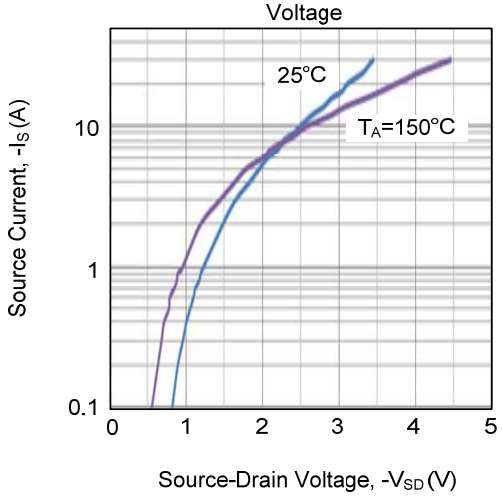
■ TYPICAL CHARACTERISTICS (Cont.)

P-CHANNEL

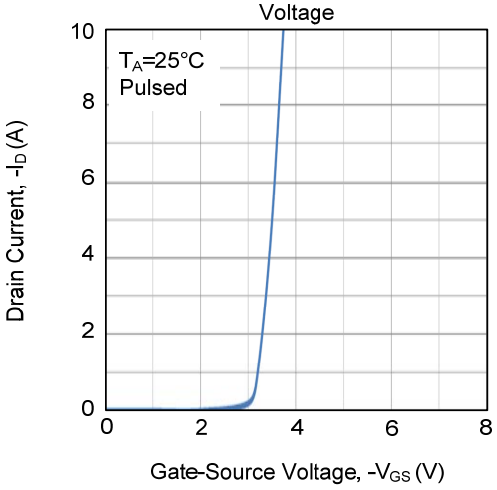
Gate Threshold Voltage vs. Junction Temperature



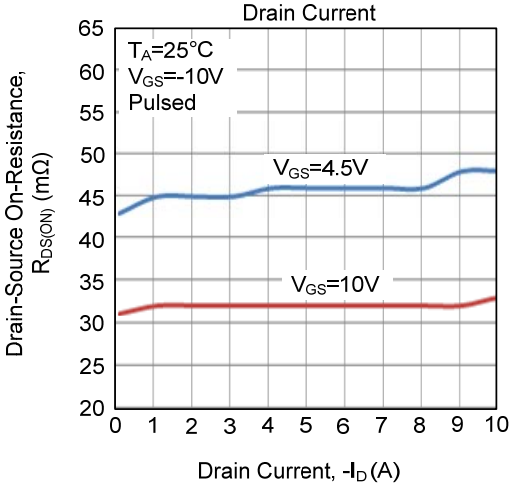
Source Current vs. Source-Drain Voltage



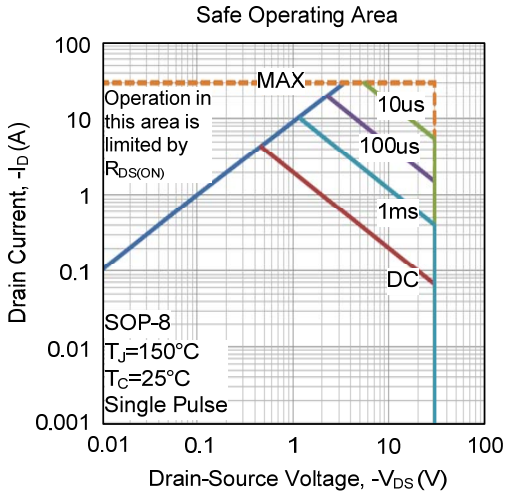
Drain Current vs. Gate-Source Voltage



Drain-Source On-Resistance vs. Drain Current



Safe Operating Area



■ TYPICAL CHARACTERISTICS (Cont.)