

**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

$R_{DS(ON)} = 22.5 \text{ m}\Omega$ (typ.) @ $V_{GS} = 10V$

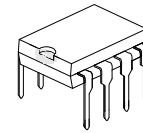
$R_{DS(ON)} = 34.5 \text{ m}\Omega$ (typ.) @ $V_{GS} = 4.5V$

* P-Channel: -30V/-6A

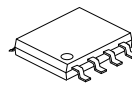
$R_{DS(ON)} = 28 \text{ m}\Omega$ (typ.) @ $V_{GS} = -10V$

$R_{DS(ON)} = 44 \text{ m}\Omega$ (typ.) @ $V_{GS} = -4.5V$

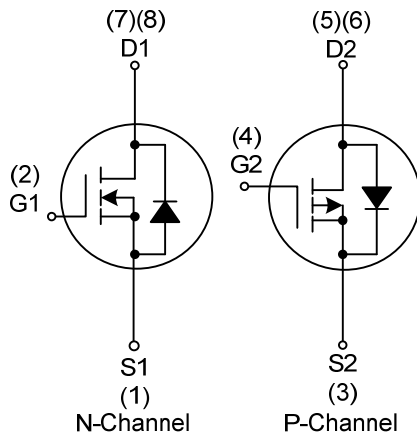
* Reliable and rugged



DIP-8

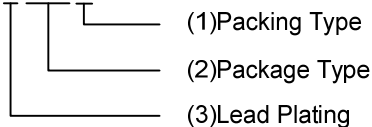


SOP-8

SYMBOL**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free Plating	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

UD4606L-D08-T

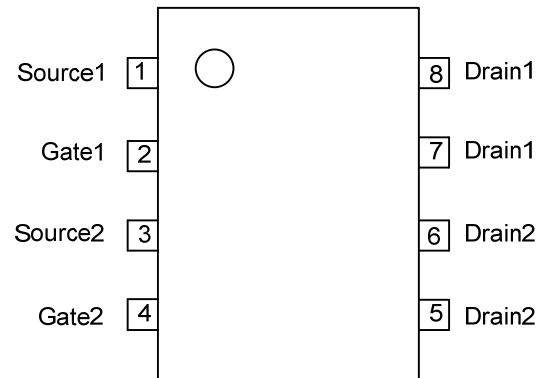


(1) R: Tape Reel, T: Tube

(2) D08: DIP-8, S08: SOP-8

(3) G: Halogen Free, L: Lead Free

■ PIN CONFIGURATION



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

N-CHANNEL

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current (Note2)		I_D	6.9	A
Pulsed Drain Current (Note2)		I_{DM}	30	A
Power Dissipation	DIP-8	P_D	2.5	W
	SOP-8		2	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

P-CHANNEL

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current (Note 2)		I_D	-6	A
Pulsed Drain Current (Note 2)		I_{DM}	-30	A
Power Dissipation	DIP-8	P_D	2.5	W
	SOP-8		2	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		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 (Note)	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} =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	1.9	3		V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =6.9A		22.5	28		mΩ
		V _{GS} =4.5V, I _D =5A		34.5	42		mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =15V, f=1.0MHZ		680			pF
Output Capacitance	C _{OSS}			102			pF
Reverse Transfer Capacitance	C _{RSS}			77			pF
SWITCHING CHARACTERISTICS							
Turn-ON Delay Time (Note2)	t _{D(ON)}	V _{DS} =15V, V _{GS} =10V, R _G =3Ω, R _L =2.2Ω		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

■ ELECTRICAL CHARACTERISTICS(Cont.)

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Total Gate Charge (Note2)	Q _G	V _{DS} =15V, V _{GS} =10V, I _D =6.9A		13.8		nC
Gate-Source Charge	Q _{GS}			1.82		nC
Gate-Drain Charge	Q _{GD}			3.2		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	I _S =1A, V _{GS} =0V		0.76	1	V
Diode Continuous Forward Current (Note3)	I _S				3	A
Reverse Recovery Time	t _{RR}	I _{DS} =6.9A, dI/dt=100A/μs		16.5		ns
Reverse Recovery Charge	Q _{RR}			7.8		nC

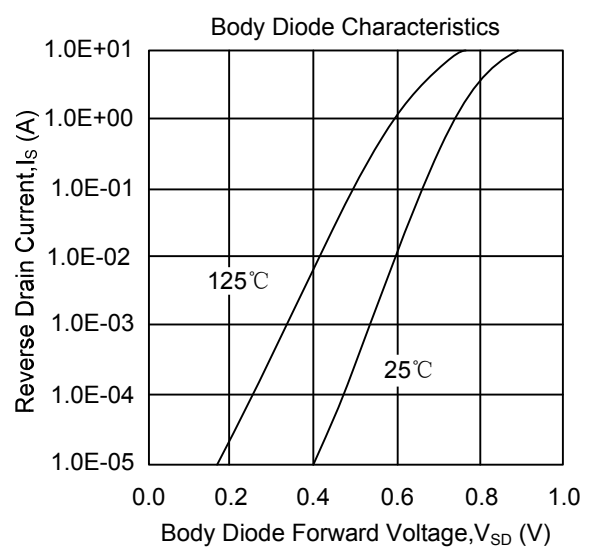
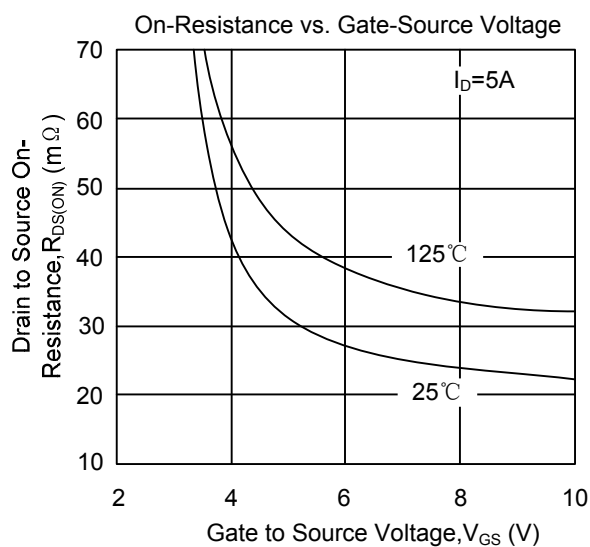
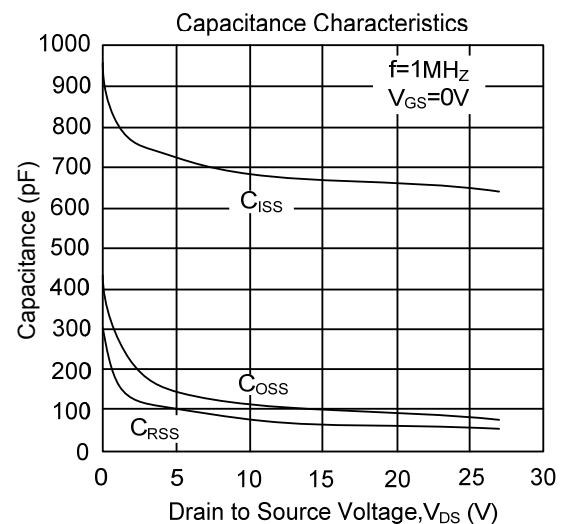
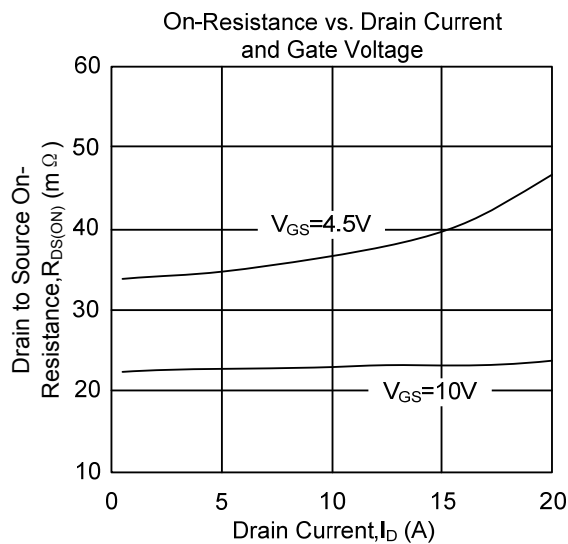
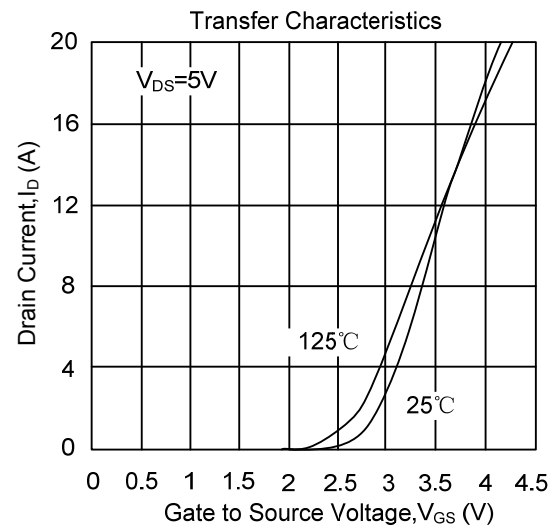
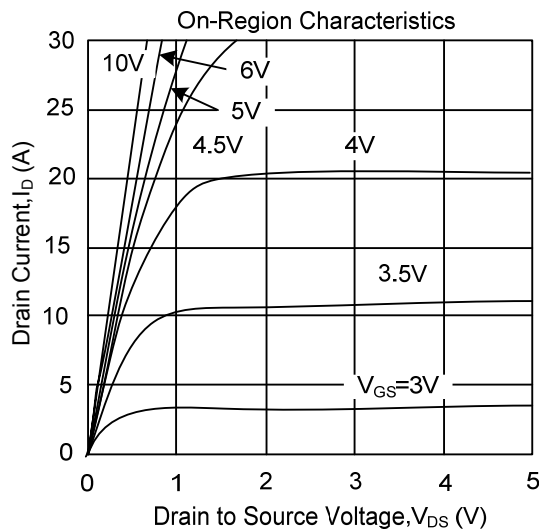
P-CHANNEL

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 =-6A		28	35	mΩ
		V _{GS} =-4.5V, I _D =-5A		44	58	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-15V, f=1.0MHz		920		pF
Output Capacitance	C _{OSS}			190		pF
Reverse Transfer Capacitance	C _{RSS}			122		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	t _{D(ON)}	V _{DS} =-15V, V _{GS} =-10V, R _G =3Ω, R _L =2.7Ω		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
Total Gate Charge (Note2)	Q _G	V _{DS} =-15V, V _{GS} =-10V, I _D =-6A		18.5		nC
Gate-Source Charge	Q _{GS}			2.7		nC
Gate-Drain Charge	Q _{GD}			4.5		nC
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V _{SD}	I _S =-1A, V _{GS} =0V		-0.76	-1	V
Diode Continuous Forward Current (Note3)	I _S				-4.2	A
Reverse Recovery Time	t _{RR}	I _{DS} =-6A, dI/dt=100A/μs		20		ns
Reverse Recovery Charge	Q _{RR}			8.8		nC

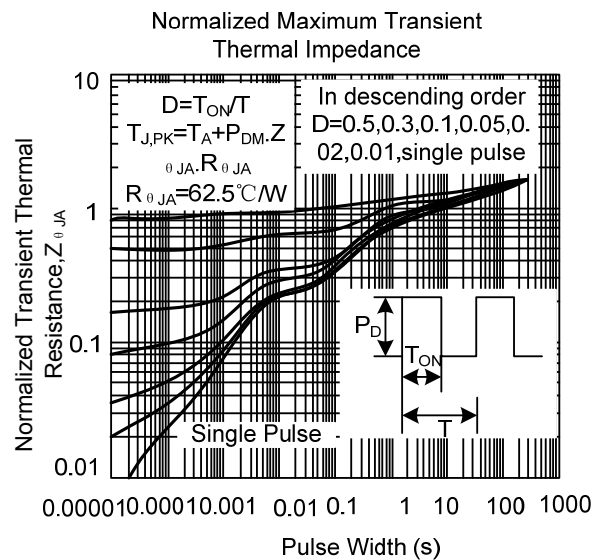
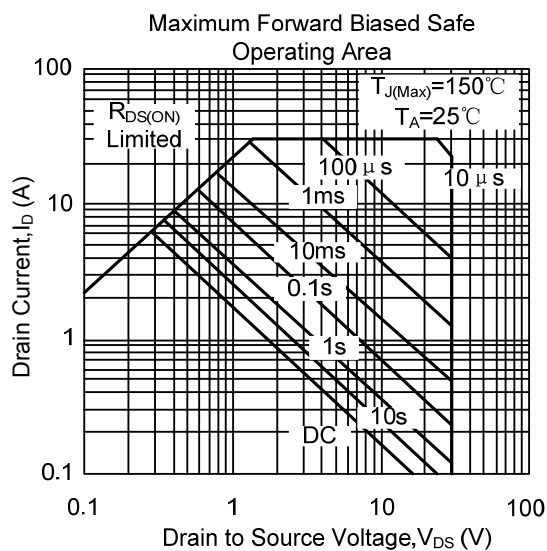
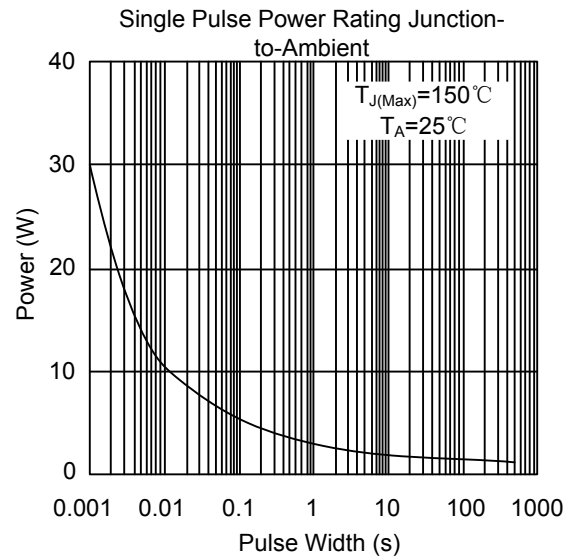
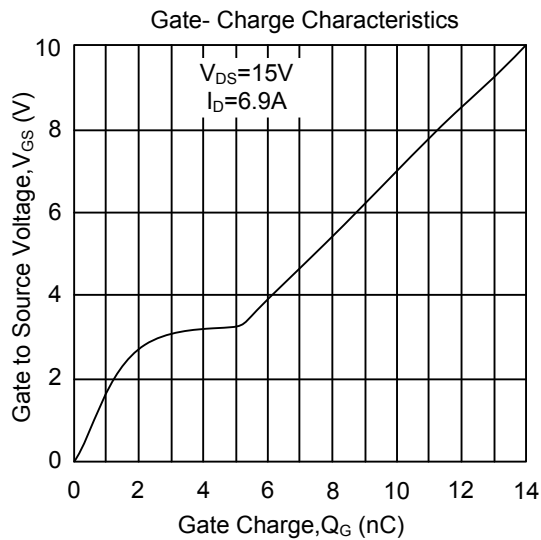
Notes: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 3. Surface Mounted on $1in^2$ pad area, $t \leq 10sec$.

■ TYPICAL CHARACTERISTICS

N-CHANNEL

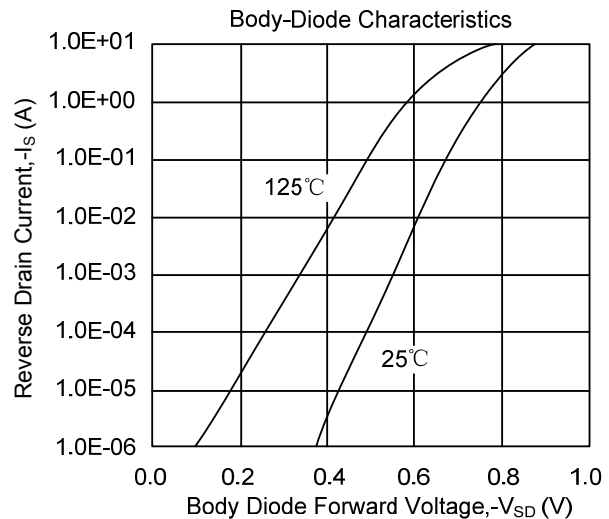
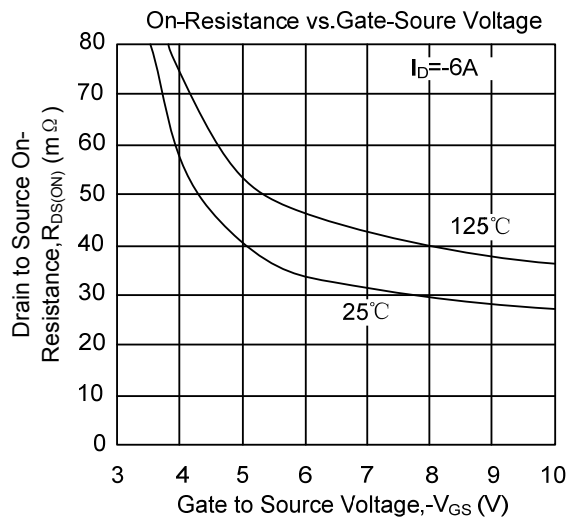
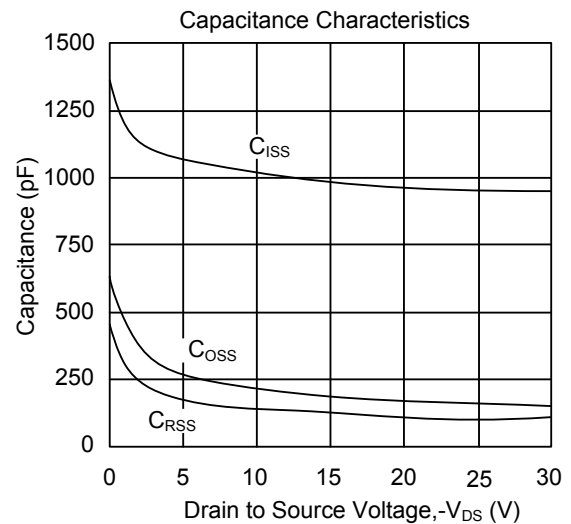
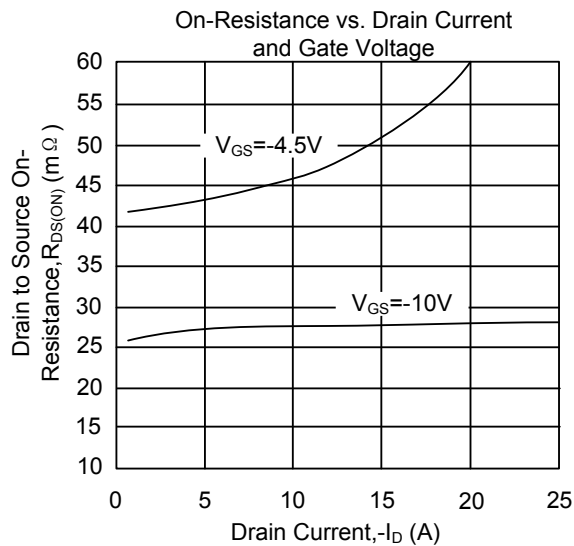
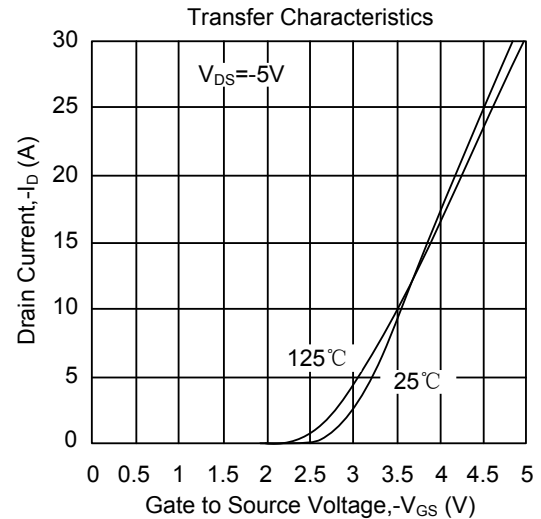
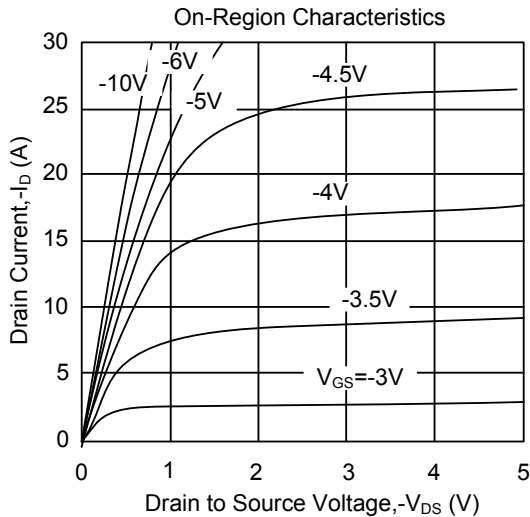


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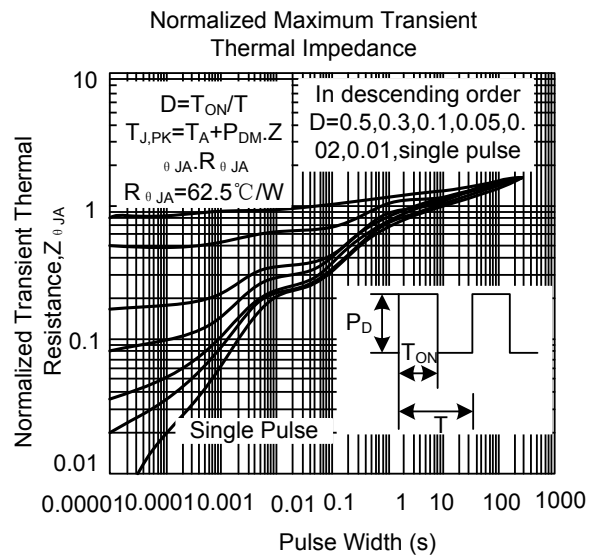
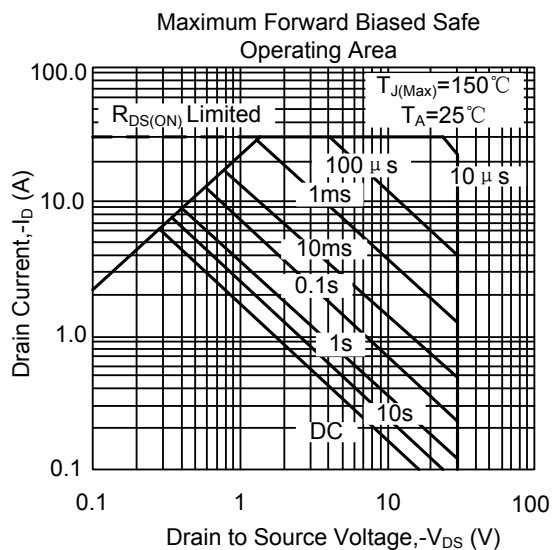
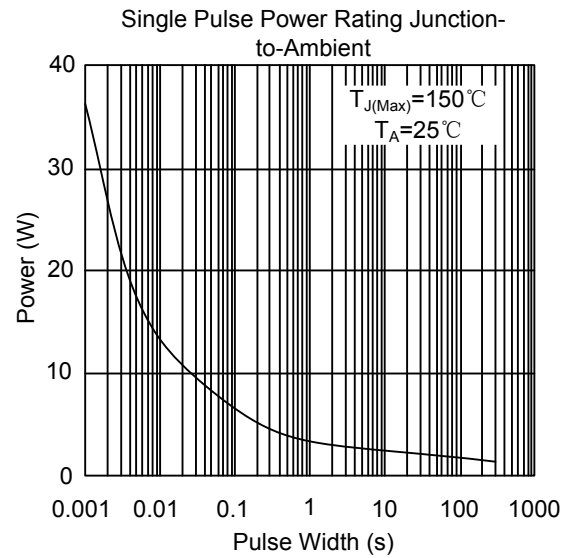
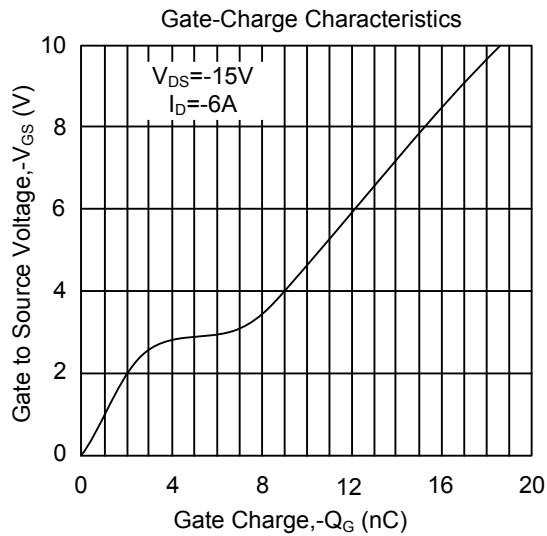


■ TYPICAL CHARACTERISTICS(Cont.)

P-CHANNEL

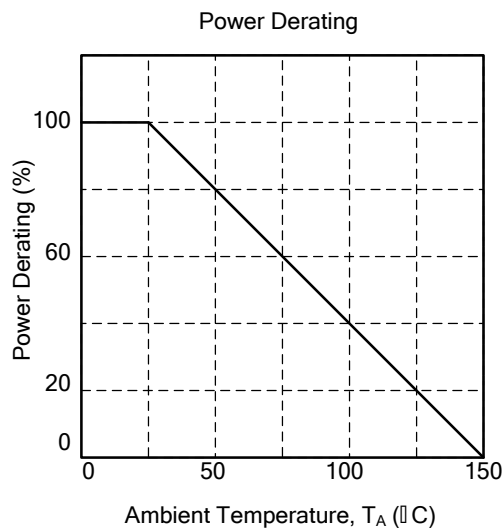


TYPICAL CHARACTERISTICS(Cont.)



■ TYPICAL CHARACTERISTICS(Cont.)

For N / P-CHANNEL



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