



UD4614

Power MOSFET

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

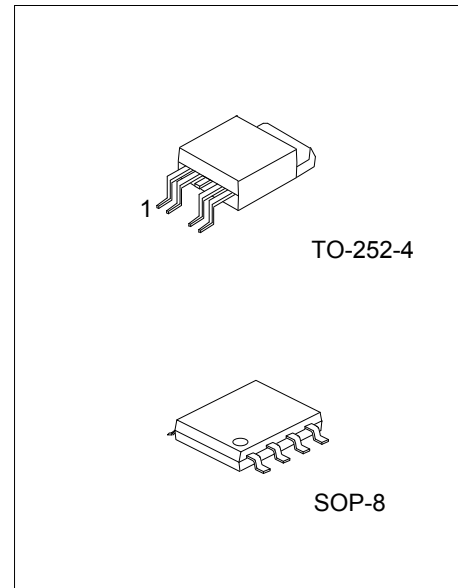
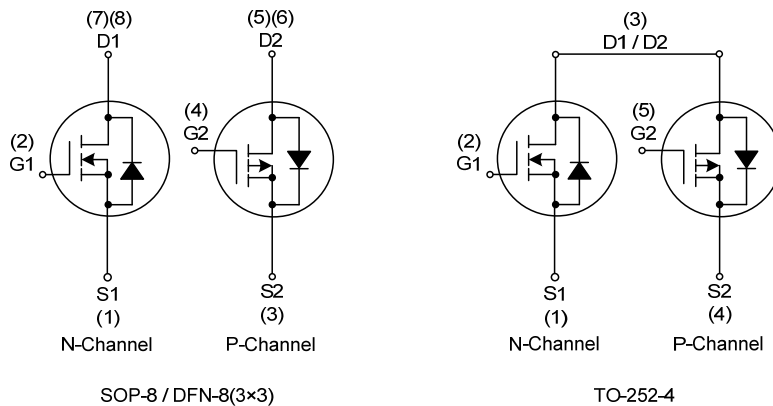
■ DESCRIPTION

The UTC **UD4614** can provide excellent $R_{DS(ON)}$ and low gate charge by using advanced trench technology MOSFETs. The UTC **UD4614** may be used in H-bridge, inverters and other applications.

■ FEATURES

- * N-Channel: 40V/6A
 $R_{DS(ON)} < 23.2m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} < 32.6m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- * P-Channel: -40V/-5A
 $R_{DS(ON)} < 34.7m\Omega$ (typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} < 50.6m\Omega$ (typ.) @ $V_{GS} = -4.5V$
- * Super high dense cell design
- * Reliable and Rugged

■ SYMBOL

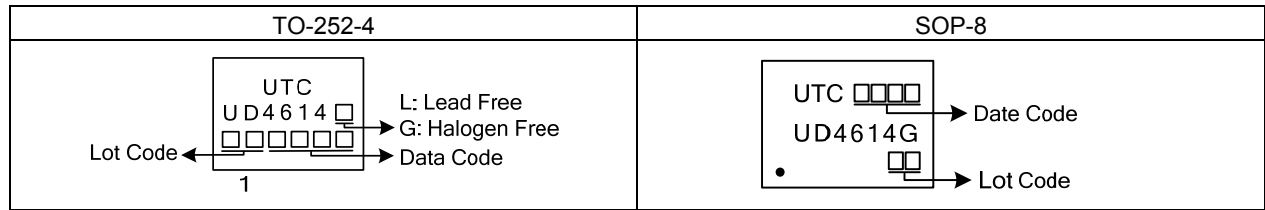


■ ORDERING INFORMATION

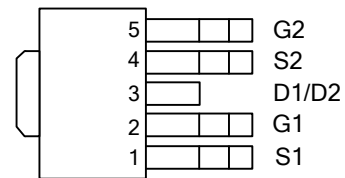
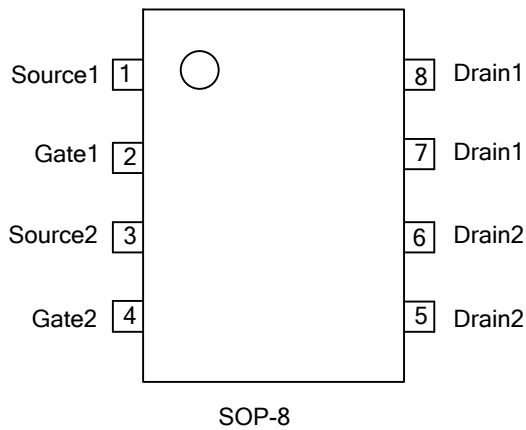
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UD4614L-TN4-R	UD4614G-TN4-R	TO-252-4	Tape Reel
-	UD4614G-S08-R	SOP-8	Tape Reel

<p>UD4614L-TN4-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) TN4: TO-252-4, S08: SOP-8 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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■ MARKING



■ PIN CONFIGURATION



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

N-Channel:

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (Note3)		I_D	6	A
Pulsed Drain Current (Note3)		I_{DM}	20	A
Power Dissipation	$T_A=25^\circ\text{C}$	TO-252-4	3.125	W
		SOP-8	2	W
	$T_A=70^\circ\text{C}$	TO-252-4	2	W
		SOP-8	1.28	W
Junction Temperature		T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

P-Channel:

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current (Note3)		I_D	-5	A
Pulsed Drain Current (Note3)		I_{DM}	-20	A
Power Dissipation	$T_A=25^\circ\text{C}$	TO-252-4	3.125	W
		SOP-8	2	W
	$T_A=70^\circ\text{C}$	TO-252-4	2	W
		SOP-8	1.28	W
Junction Temperature		T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note: 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.

■ THERMAL RESISTANCES CHARACTERISTICS

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252-4	θ_{JA}	40	$^\circ\text{C/W}$
	SOP-8		62.5	

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

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

N-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=10mA$	40			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$			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	2.3	3	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=10V, I_D=6A$		23.2	31	m Ω
		$V_{GS}=4.5V, I_D=5A$		32.6	45	m Ω
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=20V, f=1.0MHz$		780		pF
Output Capacitance	C_{OSS}			110		pF
Reverse Transfer Capacitance	C_{RSS}			86		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	$V_{DS}=20V, V_{GS}=10V,$ $R_G=3\Omega, I_D=1A$		32		ns
Turn-ON Rise Time	t_R			40		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			172		ns
Turn-OFF Fall Time	t_F			64		ns
Total Gate Charge (Note2)	Q_G	$V_{DS}=20V, V_{GS}=10V, I_D=6A$		95		nC
Gate-Source Charge	Q_{GS}			6.3		nC
Gate-Drain Charge	Q_{GD}			6.3		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=1A, V_{GS}=0V$		0.77	1	V
Diode Continuous Forward Current	I_S				3	A
Reverse Recovery Time	t_{RR}	$I_{DS}=6A, di/dt=100A/\mu s$		20.5		ns
Reverse Recovery Charge	Q_{RR}				14.5	

■ ELECTRICAL CHARACTERISTICS (Cont.)

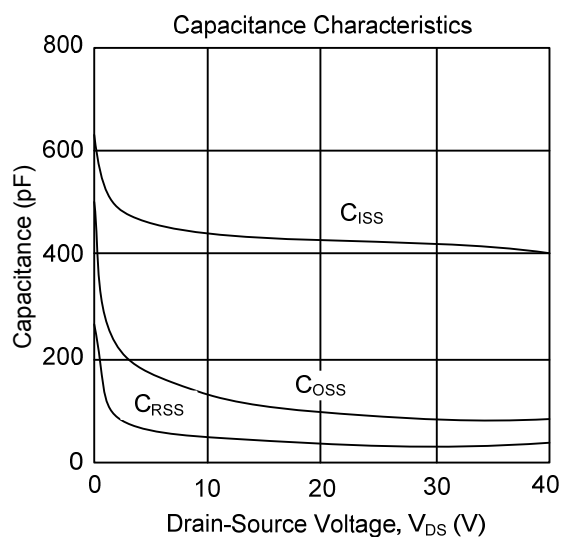
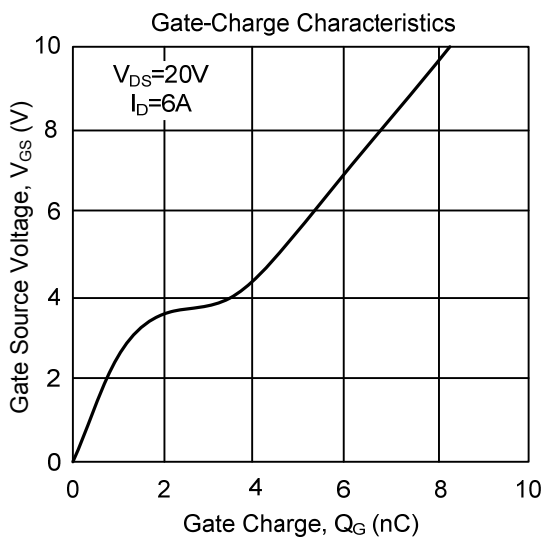
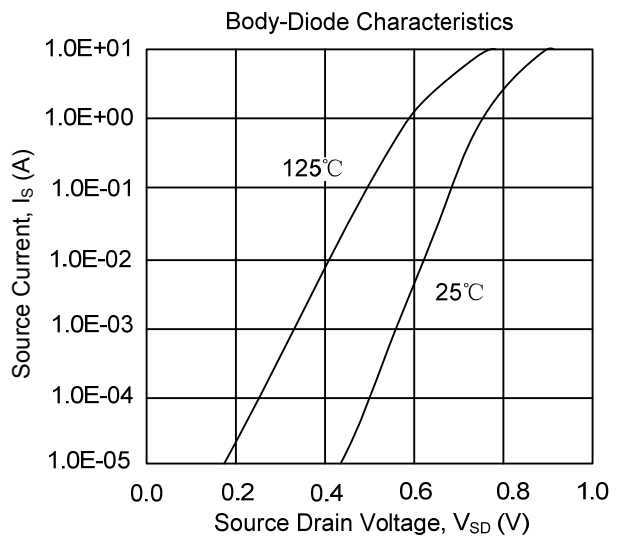
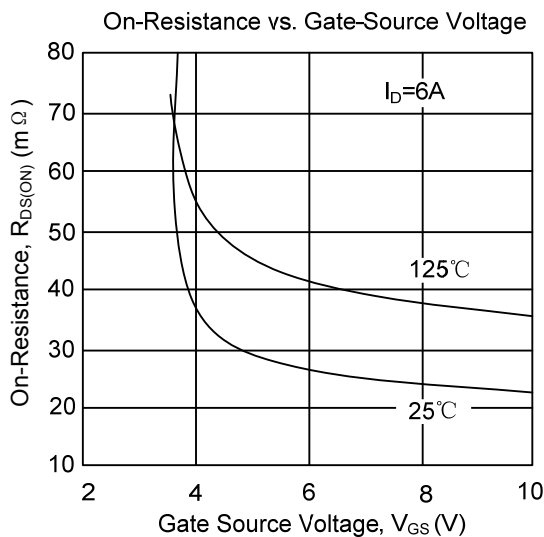
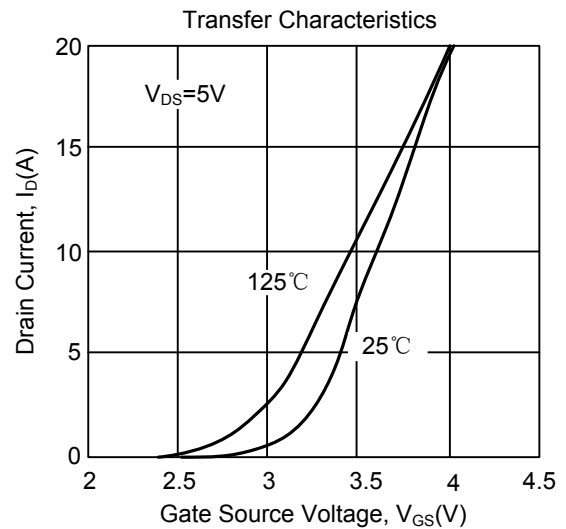
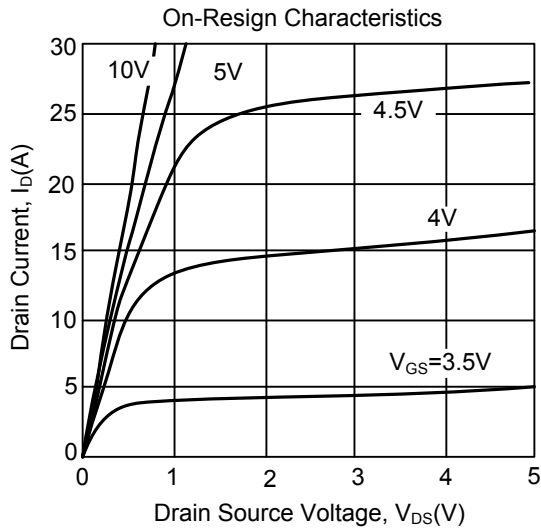
P-CHANNEL

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-10mA$	-40			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-32V, V_{GS}=0V$			-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	-1.9	-3	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-5A$		34.7	45	$m\Omega$
		$V_{GS}=-4.5V, I_D=-2A$		50.6	63	$m\Omega$
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=-20V, f=1.0MHz$		1120		pF
Output Capacitance	C_{OSS}			115		pF
Reverse Transfer Capacitance	C_{RSS}			91		pF
SWITCHING CHARACTERISTICS						
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	$V_{DS}=-20V, V_{GS}=-10V,$ $R_G=3\Omega, I_D=1A$		34		ns
Turn-ON Rise Time	t_R			48		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			224		ns
Turn-OFF Fall Time	t_F			108		ns
Total Gate Charge (Note2)	Q_G	$V_{DS}=-20V, V_{GS}=-10V, I_D=-5A$		90		nC
Gate-Source Charge	Q_{GS}			5.8		nC
Gate-Drain Charge	Q_{GD}			5.3		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	$I_S=-1A, V_{GS}=0V$		-0.75	-1	V
Diode Continuous Forward Current	I_S				-3.2	A
Reverse Recovery Time	t_{RR}	$I_{DS}=-5A, dI/dt=100A/\mu s$		22.3		ns
Reverse Recovery Charge	Q_{RR}				15.2	

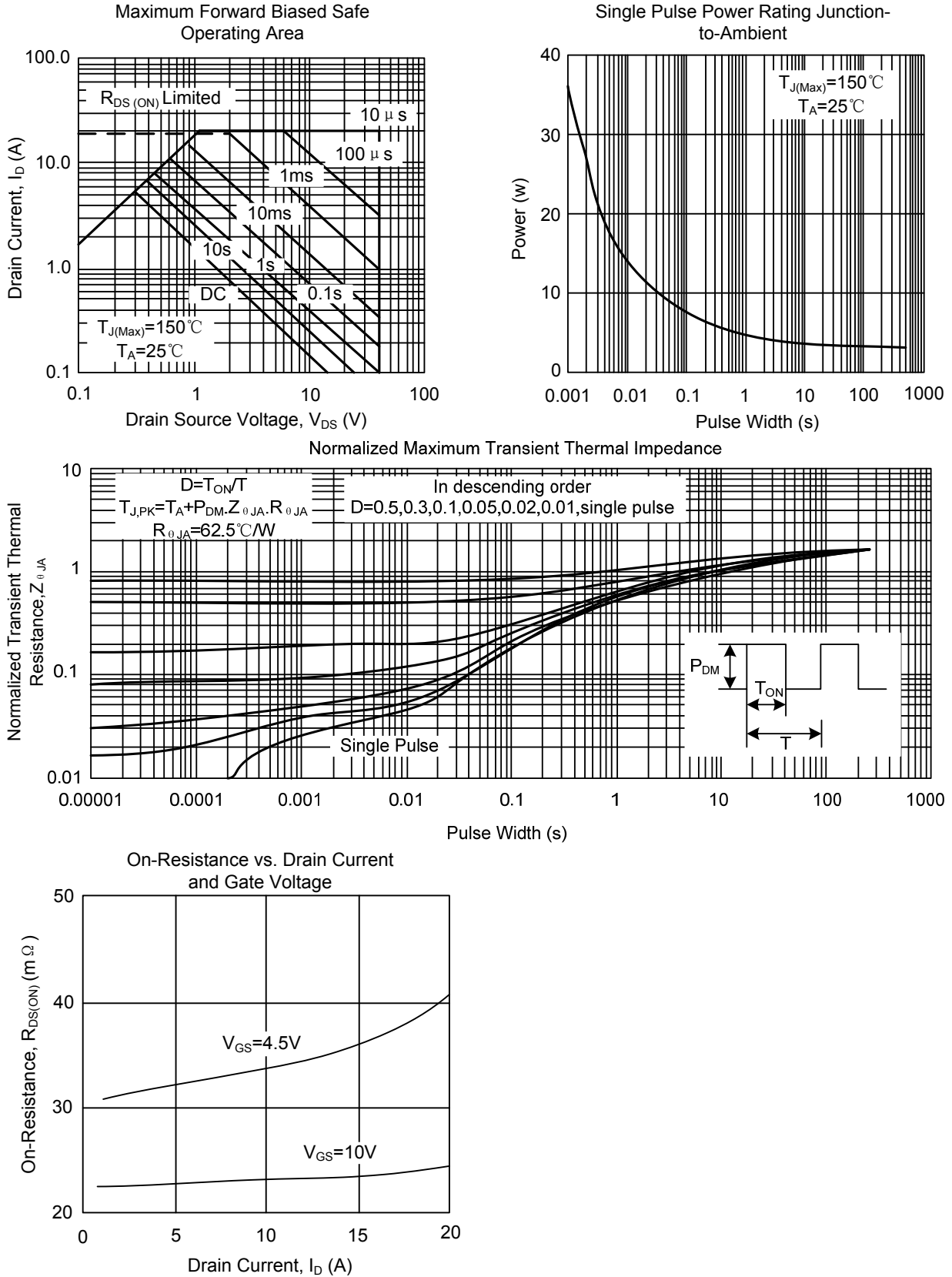
- Notes: 1. Pulse width limited by $T_{J(MAX)}$
 2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 3. Surface Mounted on $1in^2$ pad area, $t \leq 10sec$.

TYPICAL CHARACTERISTICS

N-CHANNEL

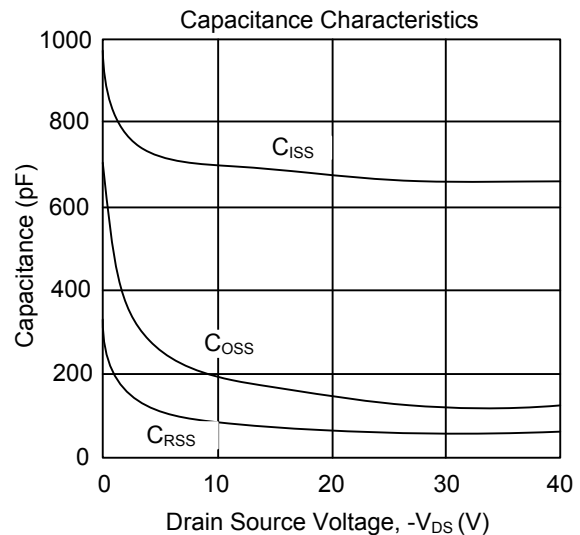
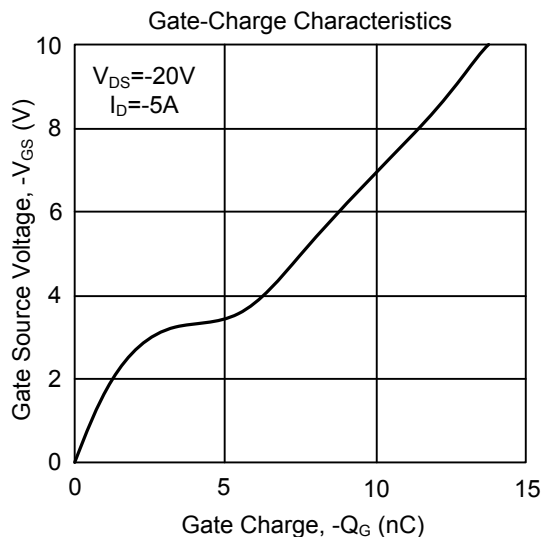
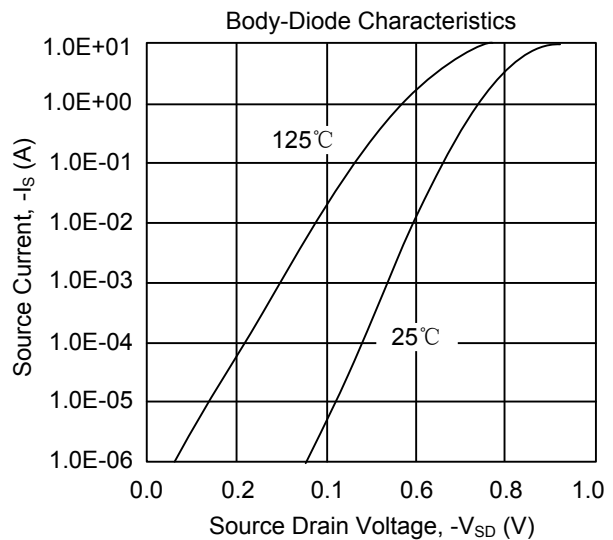
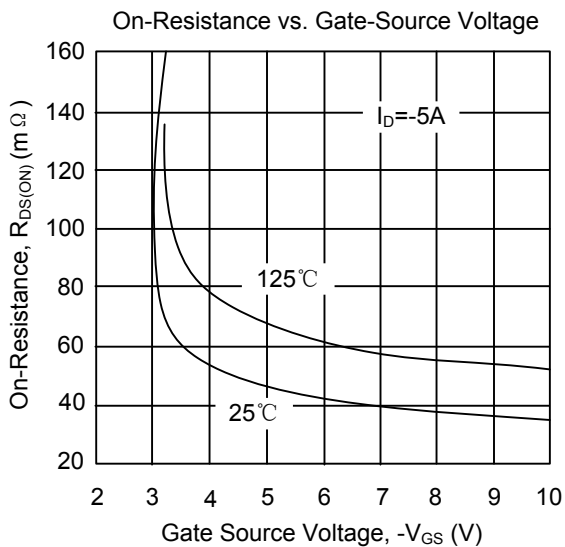
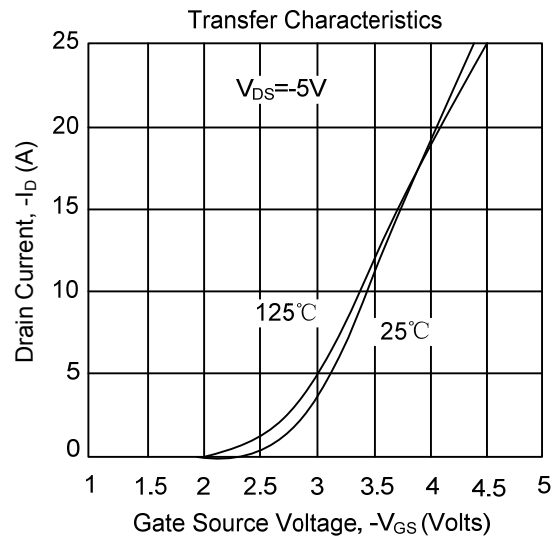
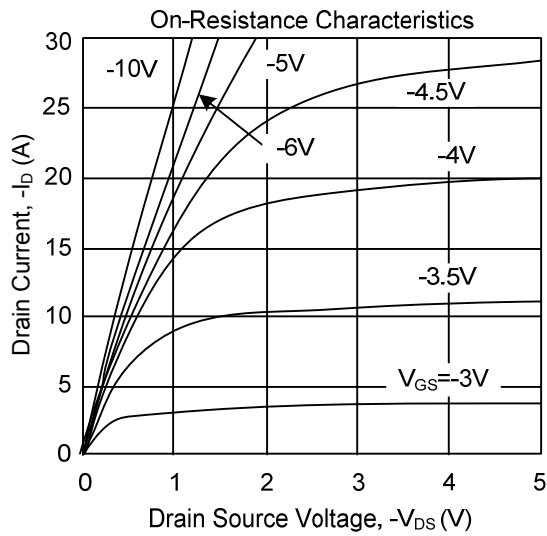


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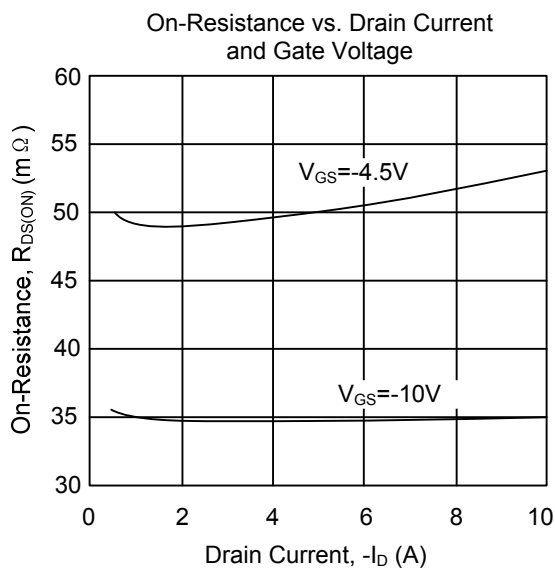
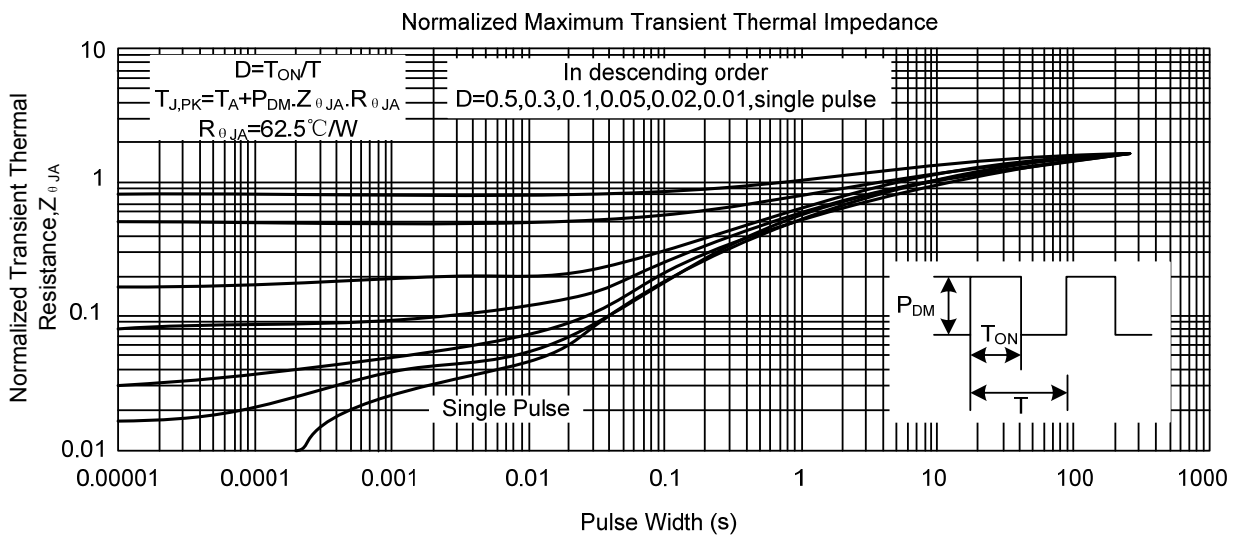
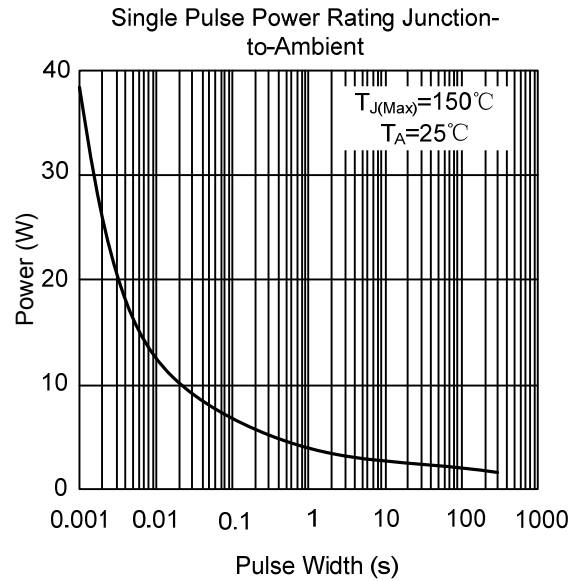
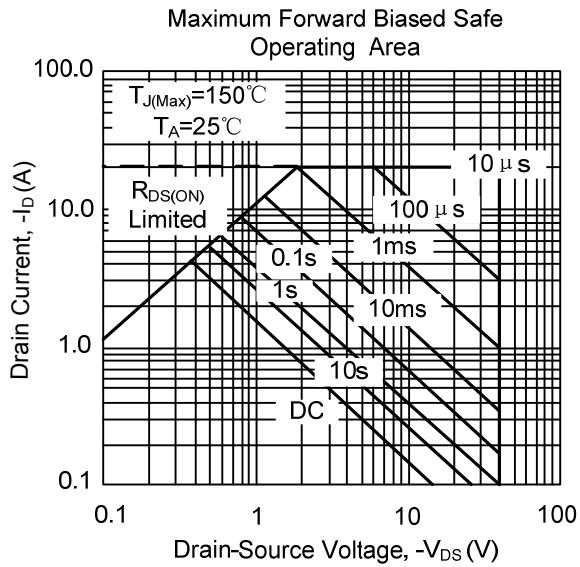


■ TYPICAL CHARACTERISTICS(Cont.)

P-CHANNEL



■ TYPICAL CHARACTERISTICS(Cont.)



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