



UT70P03

Power MOSFET

-75A, -30V P-CHANNEL POWER MOSFET

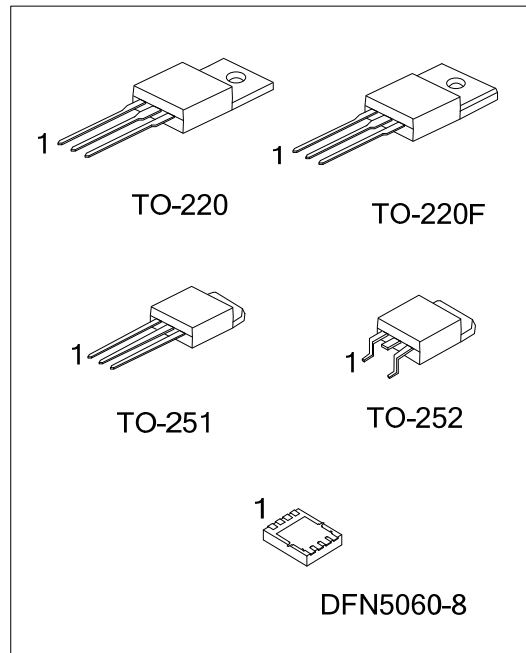
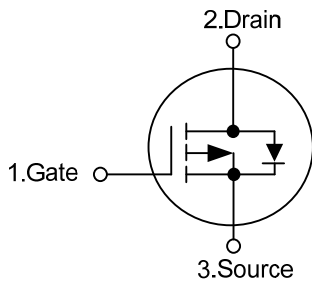
■ **DESCRIPTION**

The **UT70P03** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ **FEATURES**

- * $R_{DS(ON)} < 8m\Omega @ V_{GS} = -10V, I_D = -45A$
- * Low Capacitance
- * Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified

■ **SYMBOL**



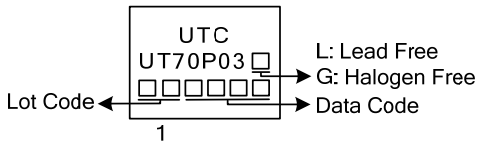
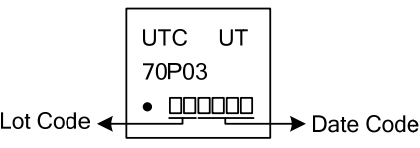
■ **ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT70P03L-TA3-T	UT70P03G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UT70P03L-TF3-T	UT70P03G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UT70P03L-TM3-T	UT70P03G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UT70P03L-TN3-R	UT70P03G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT70P03L-K08-5060-R	UT70P03G-K08-5060-R	DFN5060-8	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UT70P03G-TA3-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TM3: TO-251 TN3: TO-252, K08-5060: DFN5060-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

TO-220 / TO-220F / TO-251 / TO-252	DFN5060-8
 <p>UTC UT70P03 □ □□□□□ Lot Code ← → Data Code L: Lead Free G: Halogen Free 1</p>	 <p>UTC UT 70P03 • □□□□□ Lot Code ← → Date Code</p>

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Continuous Drain Current, $V_{GS}=4.5\text{V}$ $T_C=25^{\circ}\text{C}$		I_D	-75	A
Pulsed Drain Current(Note 2)		I_{DM}	-350	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	TO-220	P_D	147	W
	TO-220F		37	
	TO-251/ TO-252		107	
	DFN5060-8		13.6	
Junction Temperature		T_J	+175	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 ~ +175	$^{\circ}\text{C}$

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. Pulse width limited by safe operating area.

■ THERMAL DATA

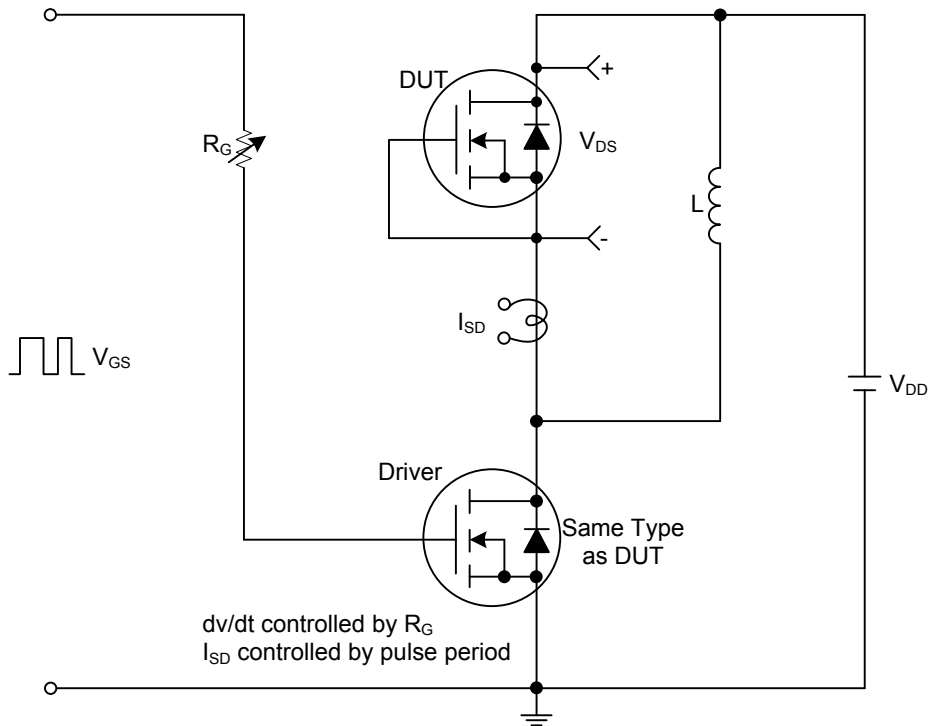
PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	$^{\circ}\text{C}/\text{W}$
	TO-251/ TO-252		110	
	DFN5060-8		65	
Junction to Case	TO-220	θ_{JC}	0.85	$^{\circ}\text{C}/\text{W}$
	TO-220F		3.4	
	TO-251/ TO-252		1.4	
	DFN5060-8		9.1	

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

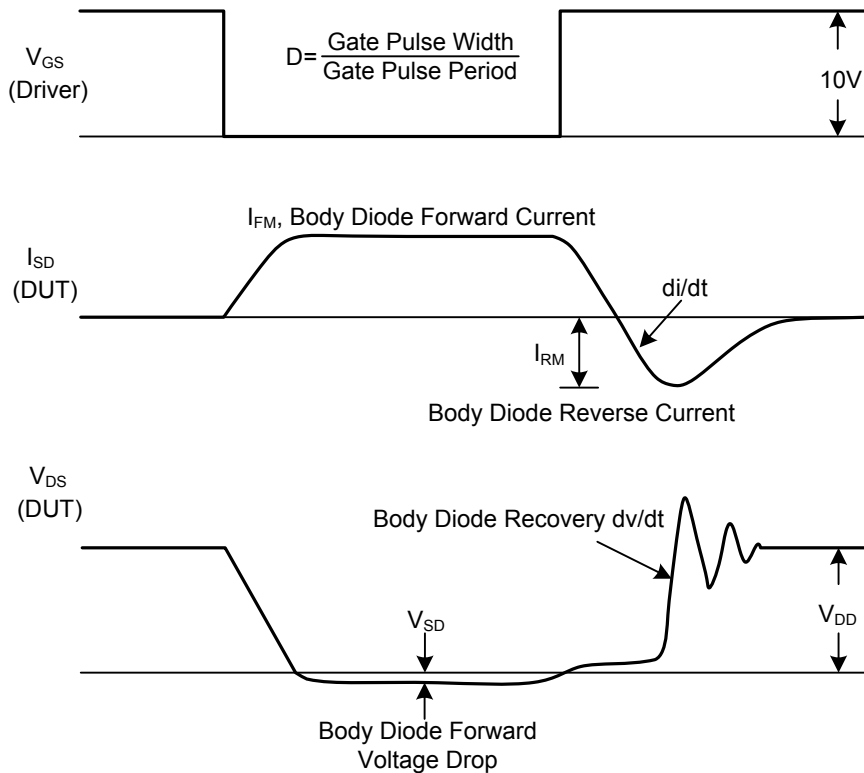
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0 V, I _D =-250 μA	-30			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Reference to 25°C, I _D =-1mA		-0.018		V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} = -30 V, V _{GS} =0 V, T _J =25°C			-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20 V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250 μA	-1		-3	V
Static Drain-Source On-Resistance (Note 2)	R _{DS(ON)}	V _{GS} =-10 V, I _D =-45 A			8	mΩ
		V _{GS} =-4.5 V, I _D =-30 A			10	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =-25 V, V _{GS} =0 V, f=1.0MHz		2700	4200	pF
Output Capacitance	C _{OSS}			550		pF
Reverse Transfer Capacitance	C _{RSS}			380		pF
SWITCHING PARAMETERS						
Total Gate Charge(Note 2)	Q _G	V _{DS} =-24 V, V _{GS} =-4.5 V, I _D =-30 A		33	52	nC
Gate Source Charge	Q _{GS}			7.5		nC
Gate Drain ("Miller") Charge	Q _{GD}			24		nC
Turn-ON Delay Time(Note 2)	t _{D(ON)}	V _{GS} =-10V, V _{DS} =-15V, R _D =0.5 Ω, I _D =-30 A, R _G =3.3 Ω		11.2		ns
Turn-ON Rise Time	t _R			77		ns
Turn-OFF Delay Time	t _{D(OFF)}			35		ns
Turn-OFF Fall-Time	t _F			67		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward On Voltage(Note 2)	V _{SD}	I _S =-45 A, V _{GS} =0V			-1.3	V
Reverse Recovery Time	t _{rr}	I _S =-30 A, V _{GS} =0 V, di/dt=100 A/μs		28		ns
Reverse Recovery Charge	Q _{rr}				10	

Notes: 1.Pulse width ≤ 300μs, duty cycle ≤ 2%.

■ TEST CIRCUITS AND WAVEFORMS



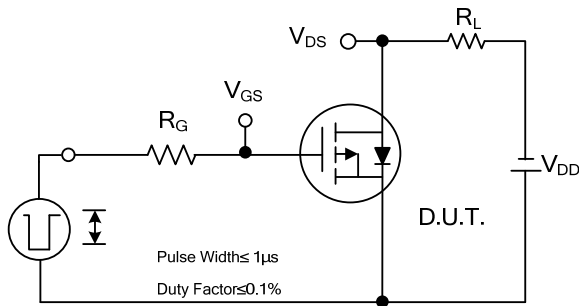
Peak Diode Recovery dv/dt Test Circuit



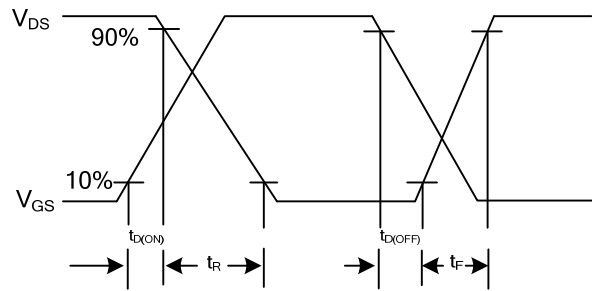
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

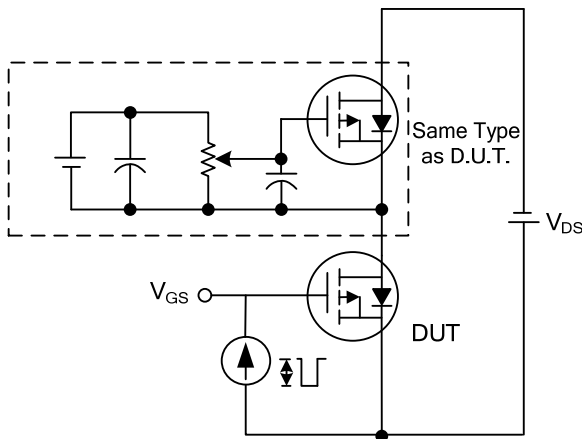
TEST CIRCUITS AND WAVEFORMS



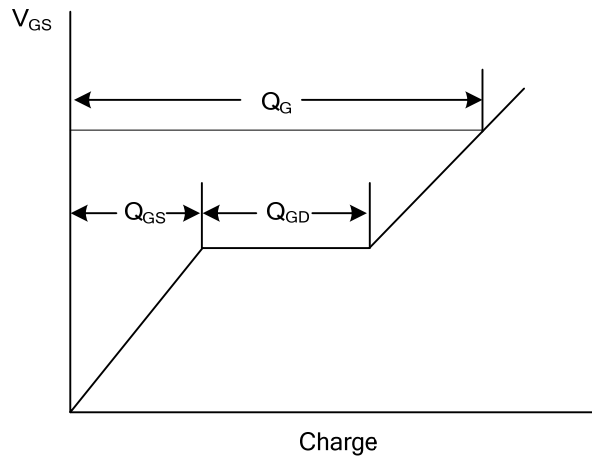
Switching Test Circuit



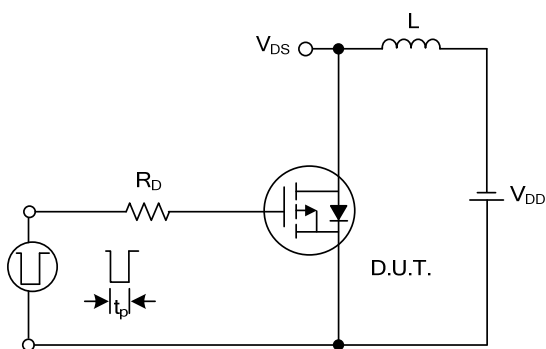
Switching Waveforms



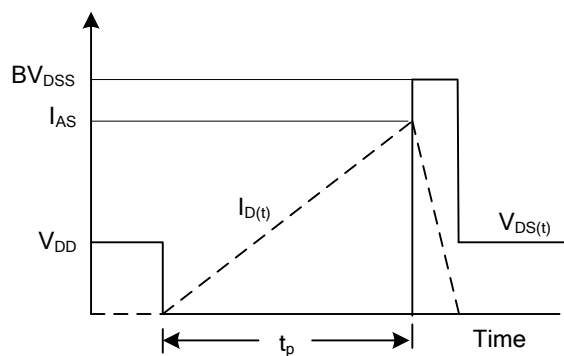
Gate Charge Test Circuit



Gate Charge Waveform

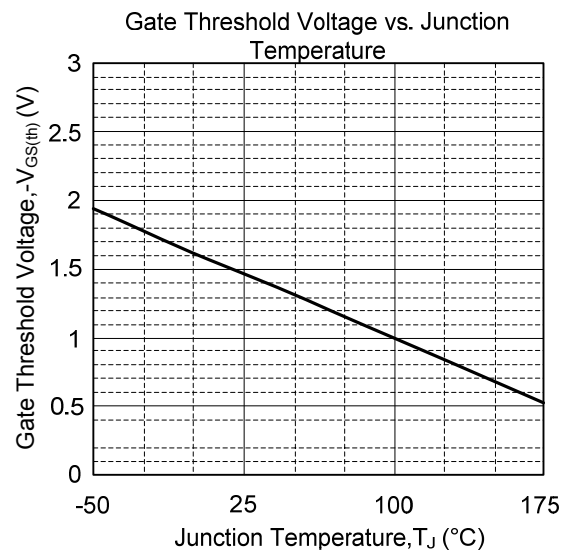
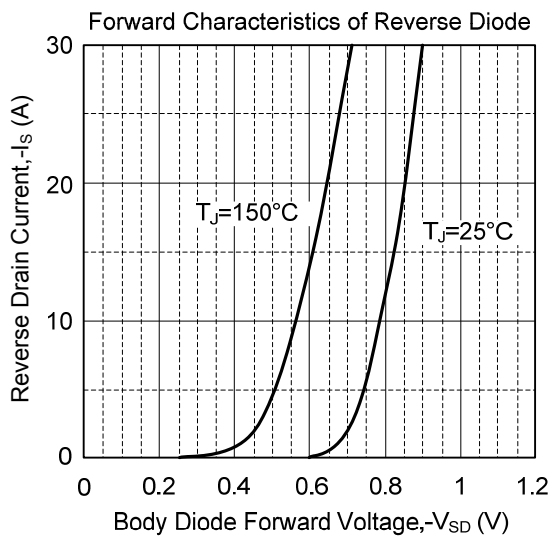
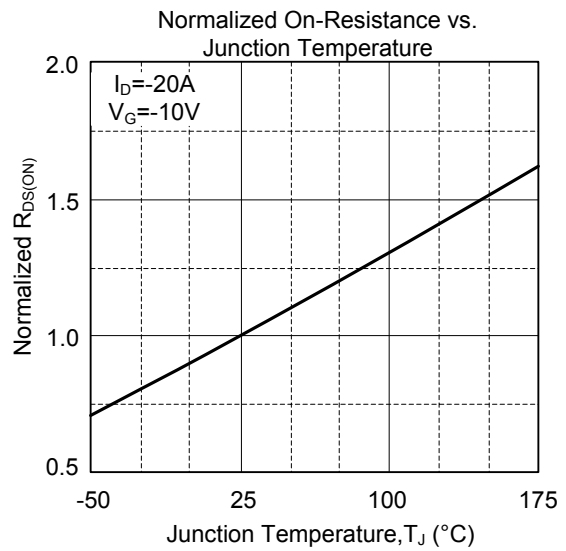
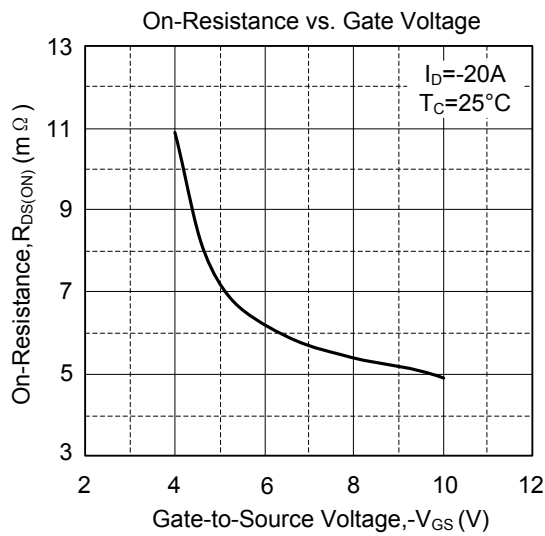
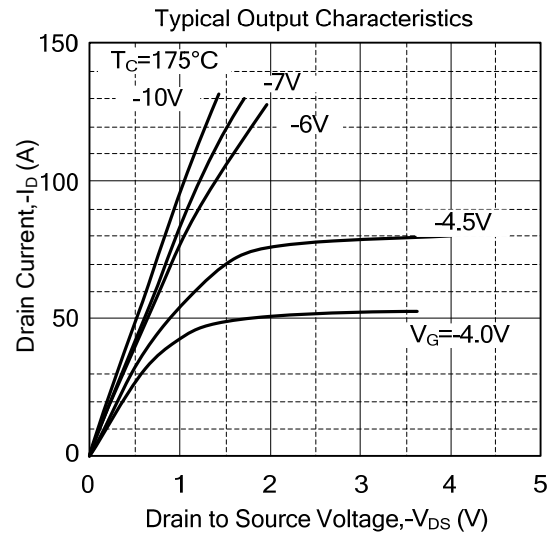
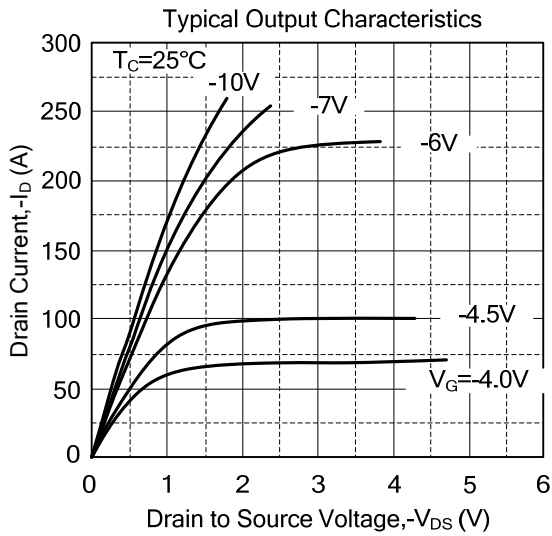


Unclamped Inductive Switching Test Circuit

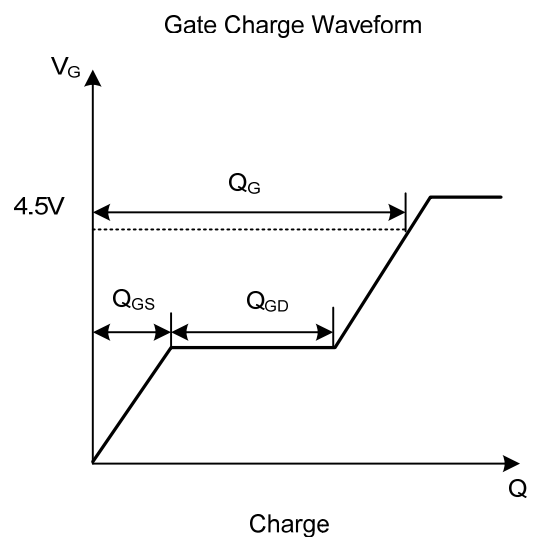
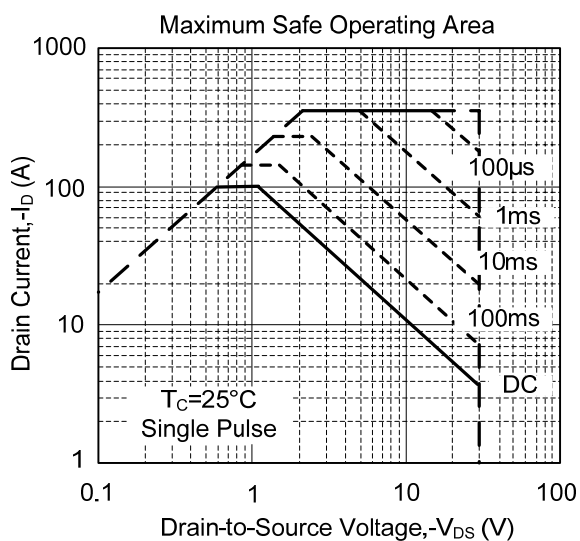
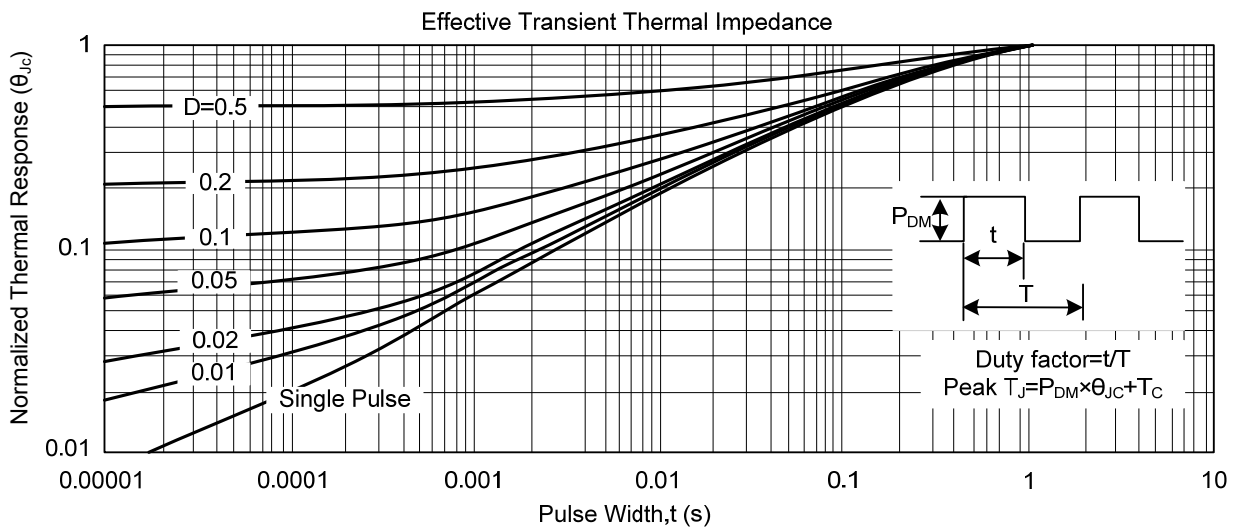
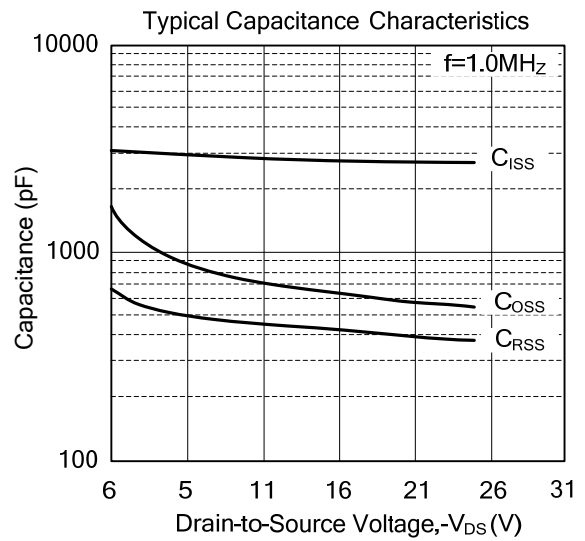
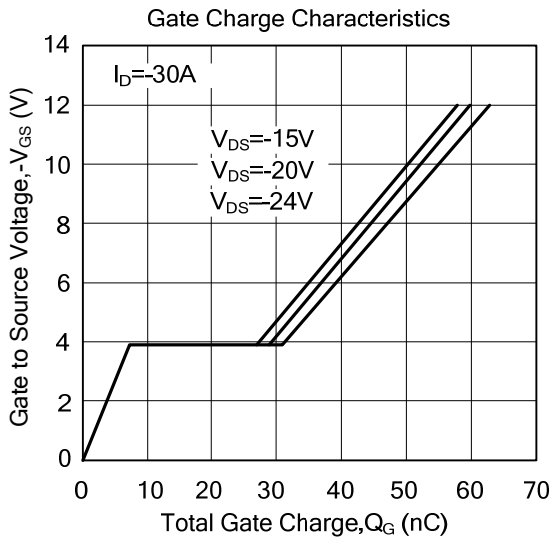


Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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