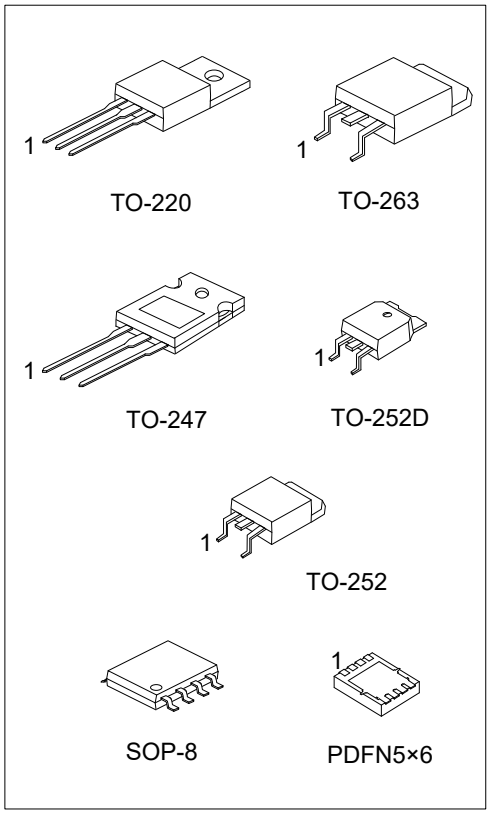
UTT80N06

Power MOSFET

60V, 80A N-CHANNEL POWER MOSFET



■ DESCRIPTION

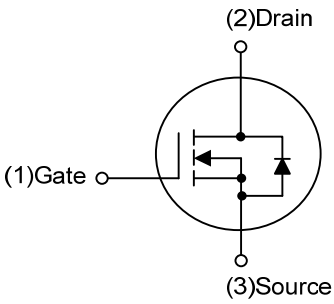
The UTC **UTT80N06** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and high switching speed. It can also withstand high energy pluse in the avalanche and commutation mode.

The UTC **UTT80N06** is suitable for active power factor correction, high efficient switched mode power supplies and electronic lamp ballast based on half bridge topology, etc.

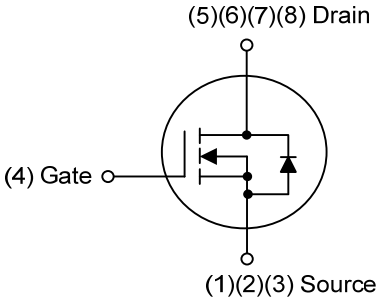
■ FEATURES

* $R_{DS(ON)}$ ≤ 7.0 mΩ @ V_{GS}=10V, I_D=40A
  $R_{DS(ON)}$ ≤ 9.0 mΩ @ V_{GS}=4.5V, I_D=40A
* High switching speed
* Improved dv/dt capability

■ SYMBOL



TO-220/TO-247/TO-252
TO-252D/TO-263



SOP-8/PDFN5×6

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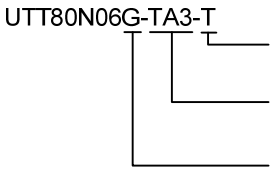
■ ORDERING INFORMATION

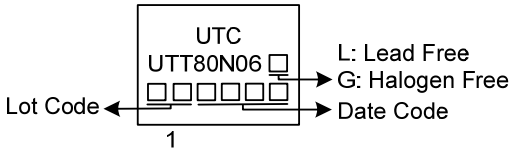
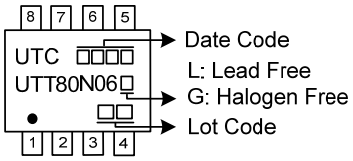
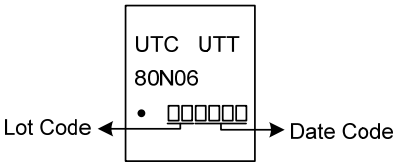
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT80N06L-TA3-T	UTT80N06G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT80N06L-TN3-R	UTT80N06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT80N06L-TND-R	UTT80N06G-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
UTT80N06L-TQ2-T	UTT80N06G-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UTT80N06L-TQ2-R	UTT80N06G-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UTT80N06L-T47-T	UTT80N06G-T47-T	TO-247	G	D	S	-	-	-	-	-	Tube
UTT80N06L-S08-R	UTT80N06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel
UTT80N06L-P5060-R	UTT80N06G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TN3: TO-252, TN3: TO-252D
TQ2: TO-263, T47: TO-247, S08: SOP-8
P5060: PDFN5×6
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
TO-220 / TO-252 TO-252D / TO-247 TO-263	
SOP-8	
PDFN5×6	

■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified) (Note 2)

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current	Continuous	T_C=25°C	I_D	80	A
		T_C=100°C		65	A
	Pulsed (Note 3)		I_{DM}	160	A
Avalanche Current (Note 3)			I_{AR}	80	A
Avalanche Energy	Single Pulsed (Note 4)		E_{AS}	100	mJ
Peak Diode Recovery dv/dt (Note 5)			dv/dt	3.2	V/nS
Power Dissipation	TO-220/TO-263		P_D	147	W
	TO-252/TO-252D			58	W
	TO-247			230	W
	SOP-8			8	W
	PDFN5×6			53	W
Junction Temperature			T_J	+150	°C
Storage Temperature			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. Drain current limited by maximum junction temperature.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.
4. L = 0.1mH, I_{AS} = 45A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C.
5. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	62.5	°C/W
	TO-252/TO-252D		110	°C/W
	TO-247		50	°C/W
	SOP-8		125 (Note)	°C/W
	PDFN5×6		65 (Note)	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	0.85	°C/W
	TO-252/TO-252D		2.2 (Note)	°C/W
	TO-247		0.54	°C/W
	SOP-8		15.6 (Note)	°C/W
	PDFN5×6		2.35 (Note)	°C/W

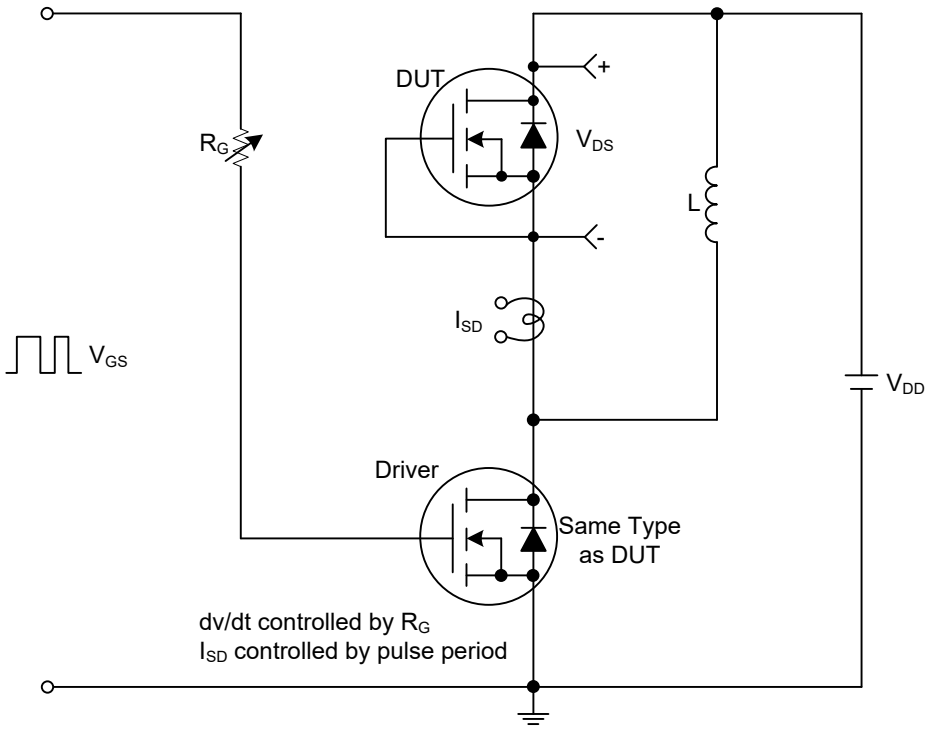
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

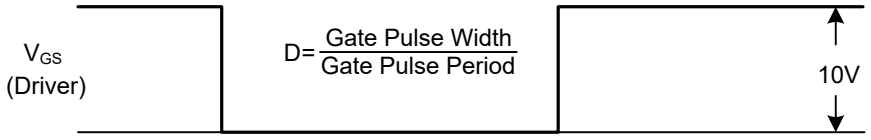
■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

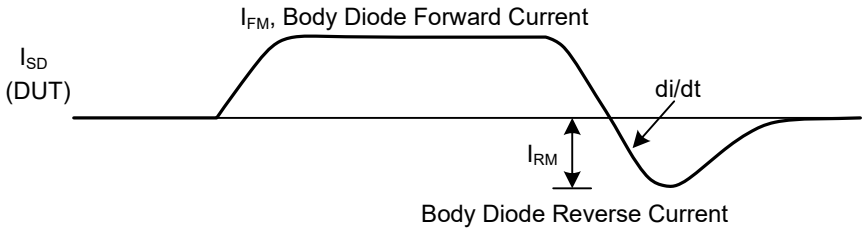
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V, T_J=25°C	60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		3.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=40A			7.0	mΩ
			V_{GS}=4.5V, I_D=40A			9.0	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		5400		pF
Output Capacitance		C_{OSS}			410		pF
Reverse Transfer Capacitance		C_{RSS}			340		pF
SWITCHING PARAMETERS							
Total Gate Charge at 10V		Q_G	V_{DS}=48V, V_{GS}=10V, I_D=80A I_G=1mA (Note 1, 2)		130		nC
Gate to Source Charge		Q_{GS}			19		nC
Gate to Drain Charge		Q_{GD}			36		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DS}=30V, V_{GS}=10V, I_D=80A, R_G=3.3Ω (Note 1, 2)		17		ns
Rise Time		t_R			20		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			75		ns
Fall-Time		t_F			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				80	A
Maximum Body-Diode Pulsed Current		I_{SM}				160	A
Drain-Source Diode Forward Voltage		V_{SD}	I_S=80A, V_{GS}=0V			1.4	V
Reverse Recovery Time		t_{rr}	I_S=30A, V_{GS}=0V, dI/dt=100A/μs		52		nS
Reverse Recovery Charge		Q_{rr}			152		nC

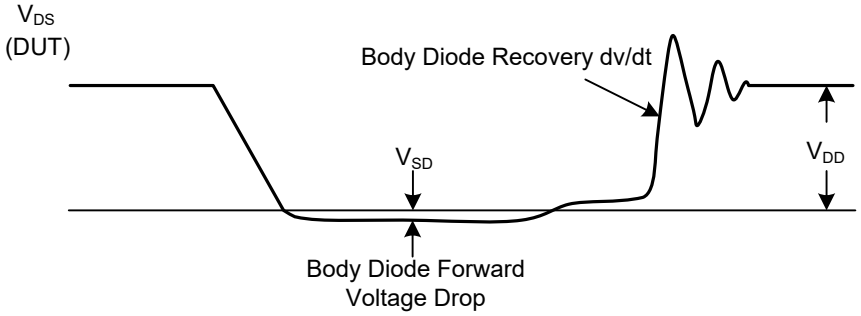
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.

■ TEST CIRCUITS AND WAVEFORMS



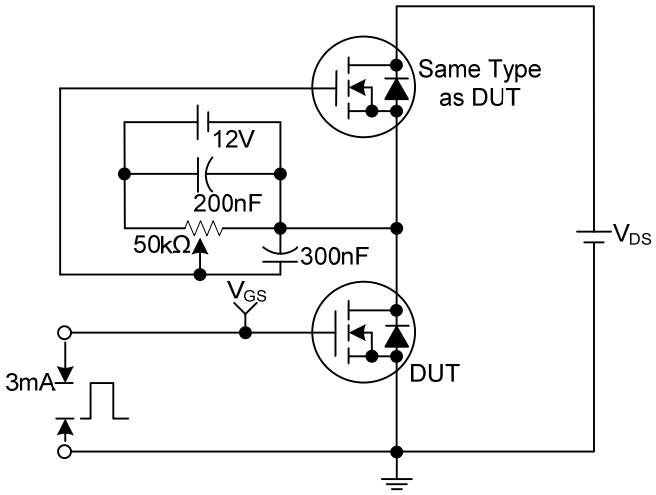




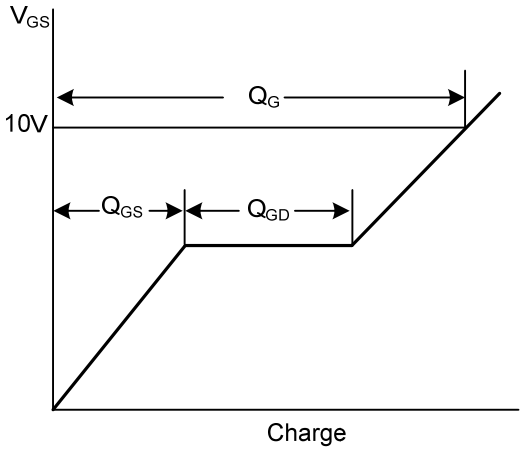


Peak Diode Recovery dv/dt Test Circuit and Waveforms

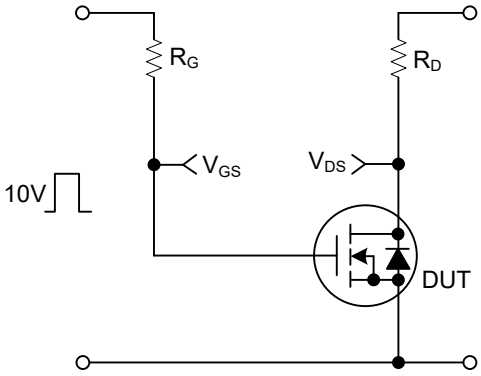
■ TEST CIRCUITS AND WAVEFORMS



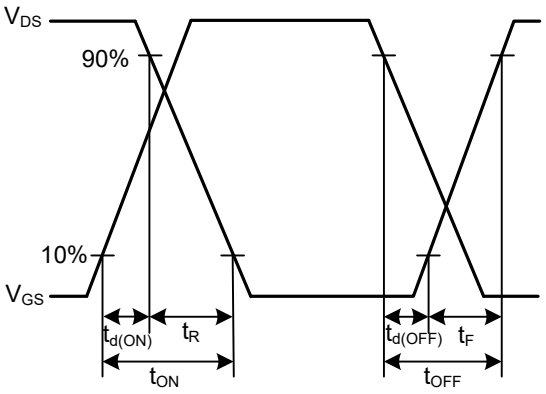
Gate Charge Test Circuit



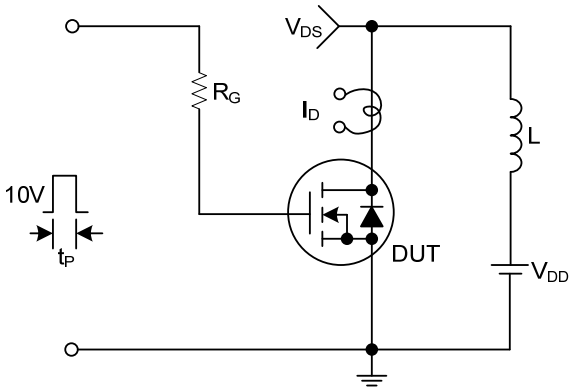
Gate Charge Waveforms



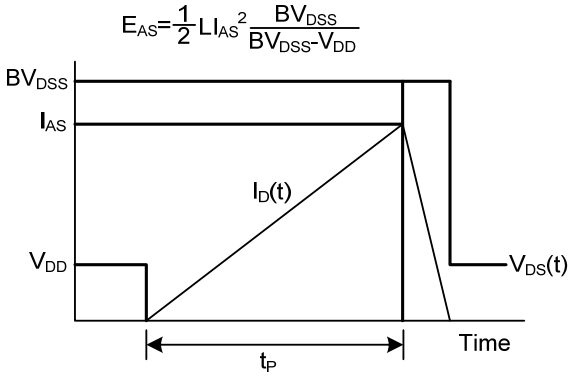
Resistive Switching Test Circuit



Resistive Switching Waveforms

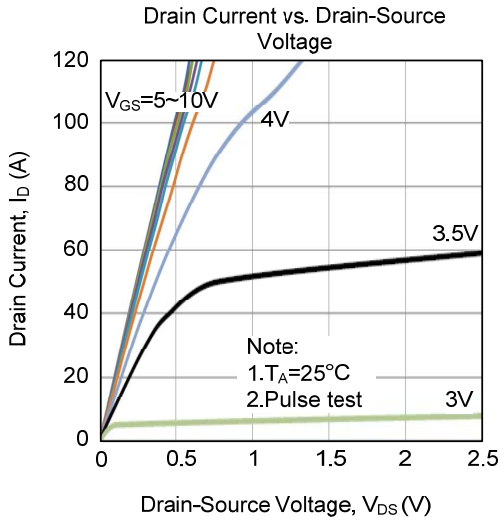


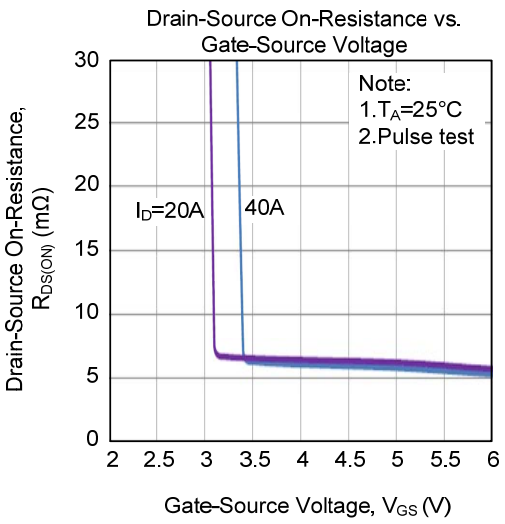
Unclamped Inductive Switching Test Circuit

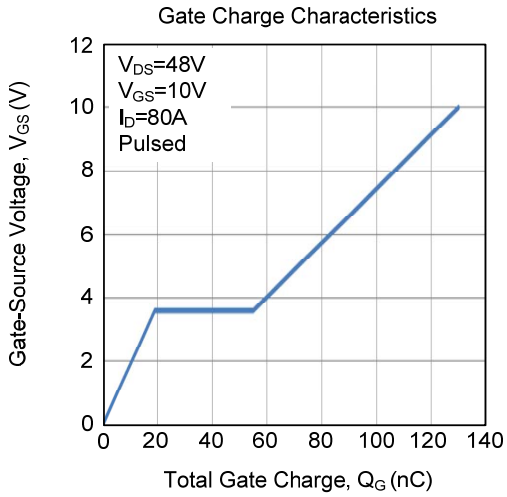


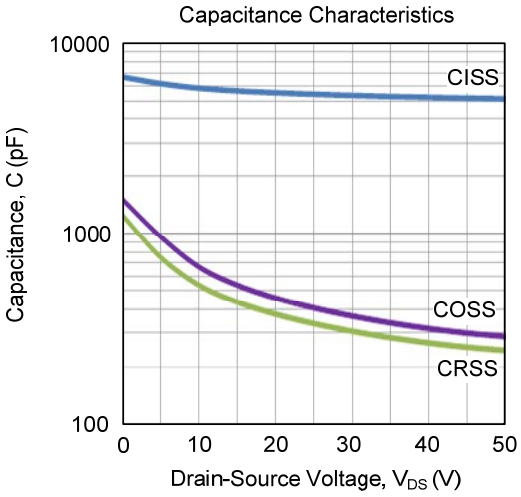
Unclamped Inductive Switching Waveforms

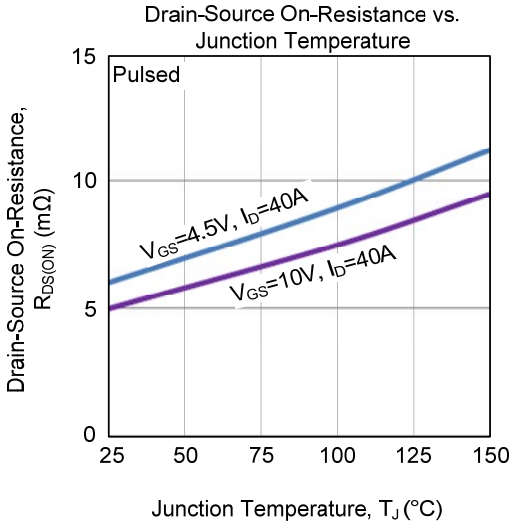
■ TYPICAL CHARACTERISTICS

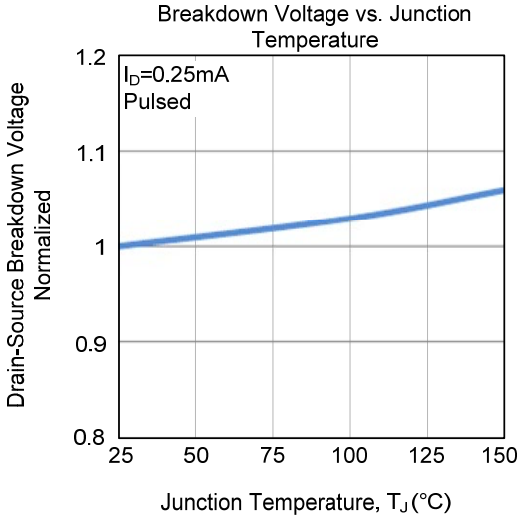






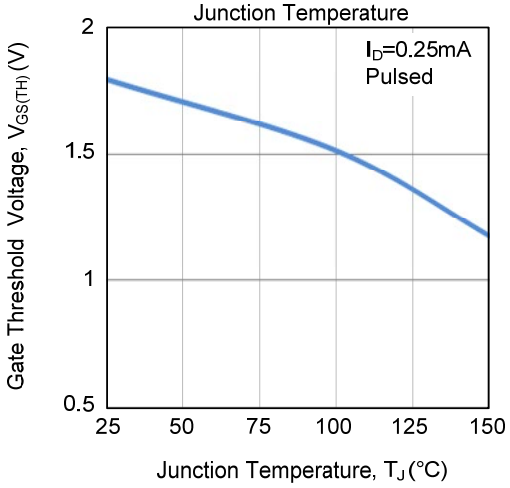




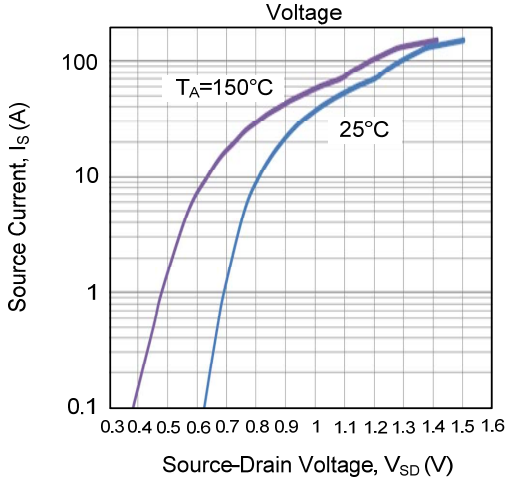


■ TYPICAL CHARACTERISTICS (Cont.)

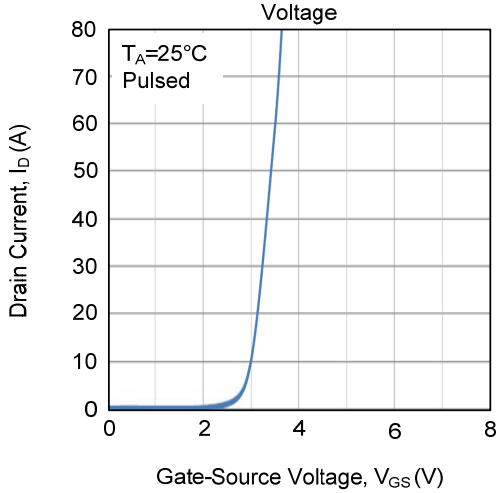
Gate Threshold Voltage vs. Junction Temperature



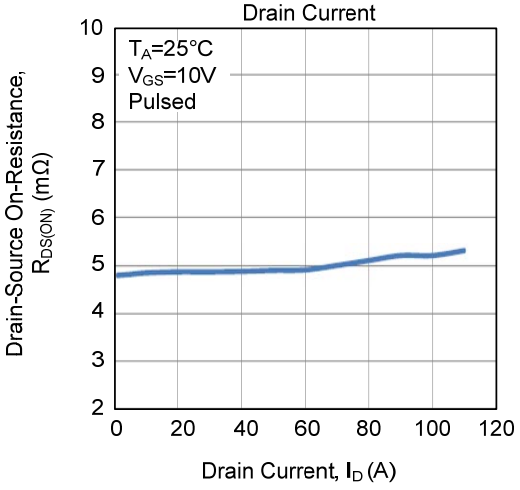
Source Current vs. Source-Drain Voltage



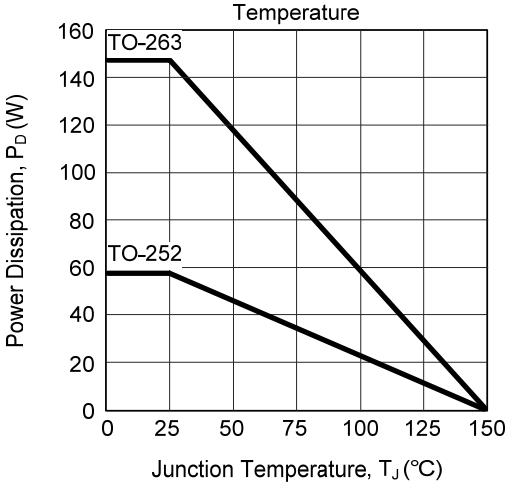
Drain Current vs. Gate-Source Voltage



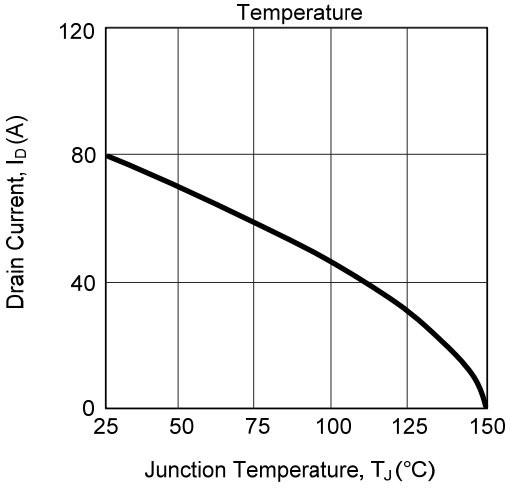
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



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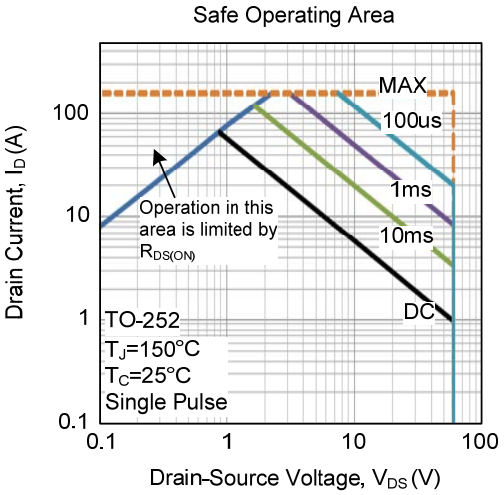

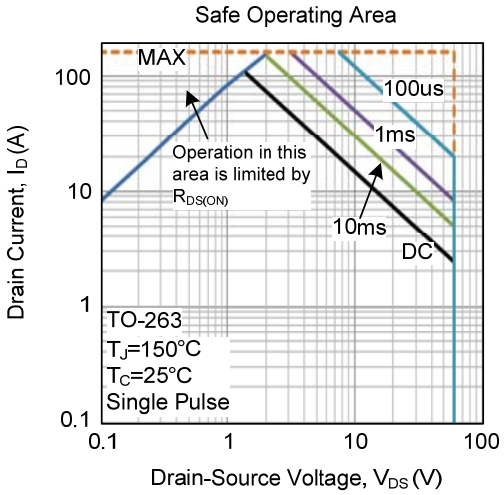

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