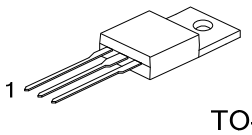
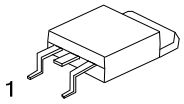
UTT60N06

Power MOSFET

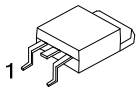
N-CHANNEL ENHANCEMENT MODE POWER MOSFET



TO-220



TO-263



TO-252

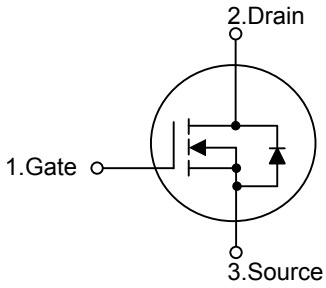
■ DESCRIPTION

The UTC **UTT60N06** is n-channel enhancement mode power field effect transistors with stable off-state characteristics, fast switching speed and low thermal resistance. usually used at telecom and computer applications.

■ FEATURES

* $R_{DS(ON)}$ < 18mΩ @ V_{GS} = 10 V
* Fast switching capability
* Avalanche energy Specified

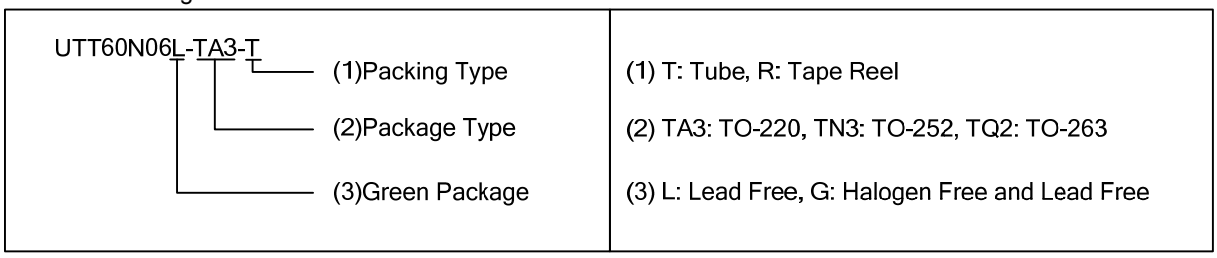
■ SYMBOL



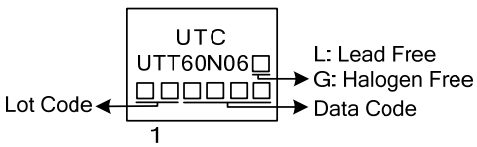
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT60N06L-TA3-T	UTT60N06G-TA3-T	TO-220	G	D	S	Tube
UTT60N06L-TN3-R	UTT60N06G-TN3-R	TO-252	G	D	S	Tape Reel
UTT60N06L-TQ2-T	UTT60N06G-TQ2-T	TO-263	G	D	S	Tube
UTT60N06L-TQ2-R	UTT60N06G-TQ2-R	TO-263	G	D	S	Tape Reel

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



■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain to Source Voltage		V_{DSS}	60	V
Gate to Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25°C	I_D	60	A
	T_C = 100°C		39	A
Drain Current Pulsed (Note 2)		I_{DM}	120	A
Avalanche Energy	Single Pulsed	E_{AS}	100	mJ
Power Dissipation (T_C=25°C)	TO-220/TO-263	P_D	100	W
	TO-252		70	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. Repeativity rating: pulse width limited by junction temperature

■ THERMAL DATA

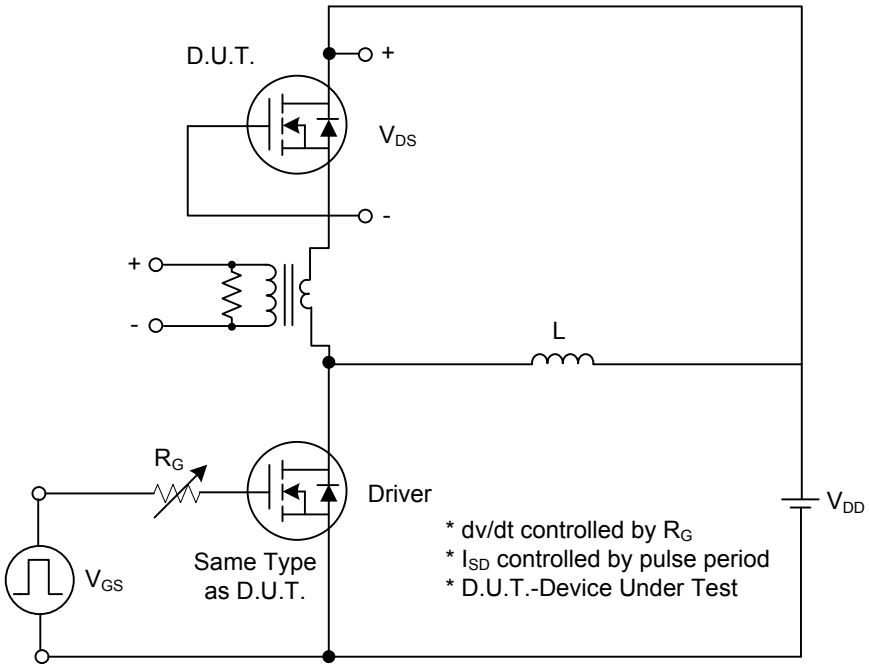
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-263	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	1.25	°C/W
	TO-252		1.8	°C/W

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

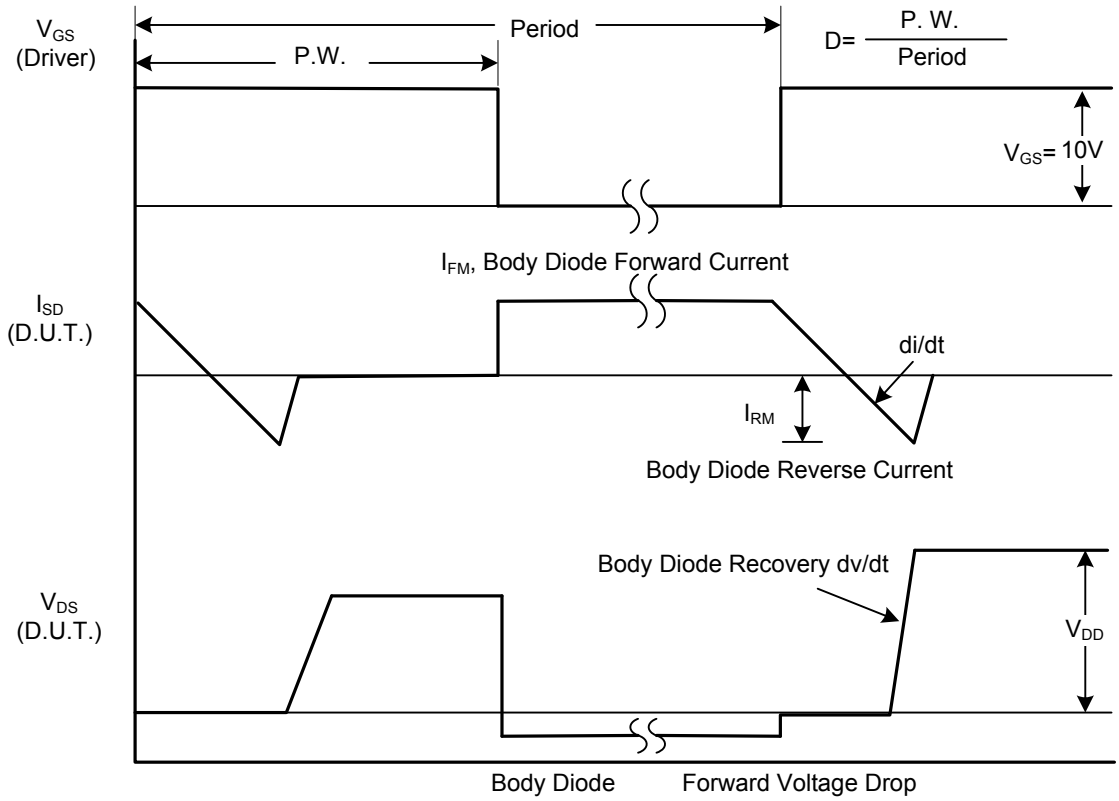
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS} = 0 V, I_D = 250μA	60			V
Drain-Source Leakage Current		I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS} = 20V, V_{DS} = 0 V			100	nA
	Reverse		V_{GS} = -20V, V_{DS} = 0 V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 30 A		14	18	mΩ
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	V_{GS} = 0V, V_{DS} =25V, f = 1MHz		2000		pF
Output Capacitance		C_{OSS}			400		pF
Reverse Transfer Capacitance		C_{RSS}			115		pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		$t_{D(ON)}$	V_{DD}=48V, I_D=60A, R_L=0.5Ω, V_{GS}=10V (Note 1, 2)		12	30	ns
Rise Time		t_R			11	30	ns
Turn-Off Delay Time		$t_{D(OFF)}$			25	50	ns
Fall Time		t_F			15	30	ns
Total Gate Charge		Q_G	V_{DS} = 30V, V_{GS} = 10 V, I_D = 60A (Note 1, 2)		39	60	nC
Gate-Source Charge		Q_{GS}			12		nC
Gate-Drain Charge (Miller Charge)		Q_{GD}			10		nC
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Diode Forward Voltage		V_{SD}	V_{GS} = 0 V, I_S = 60A			1.6	V
Continuous Source Current		I_S				60	A
Pulsed Source Current		I_{SM}				120	
Reverse Recovery Time		t_{RR}	I_S = 60A, V_{GS} = 0 V, dI_F/dt = 100 A/μs (Note 1)		60		ns
Reverse Recovery Charge		Q_{RR}			3.4		μC

Notes: 1. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

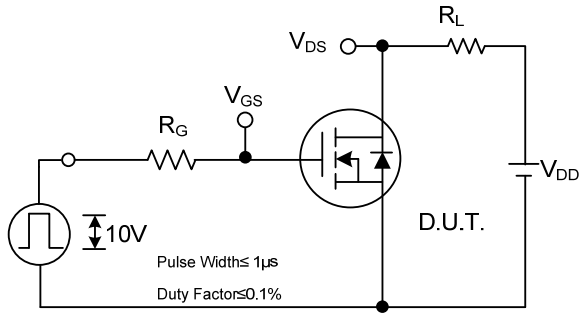


Peak Diode Recovery dv/dt Test Circuit

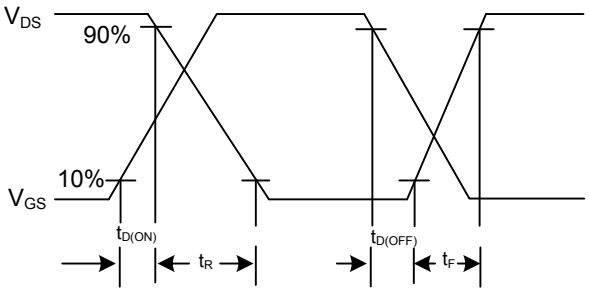


Peak Diode Recovery dv/dt Waveforms

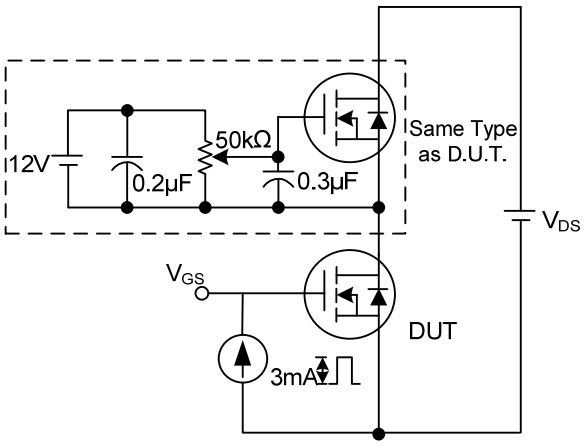
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



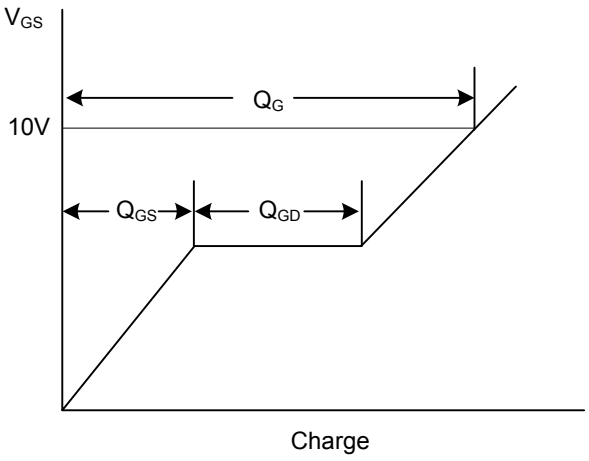
Switching Test Circuit



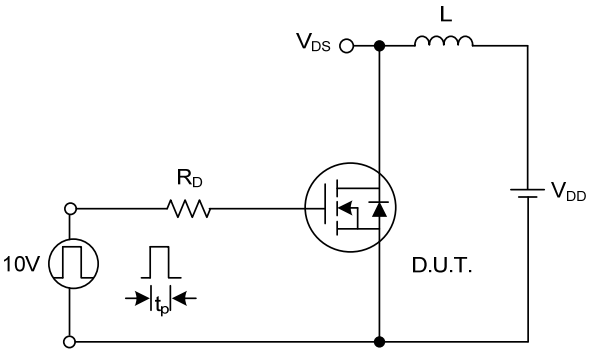
Switching Waveforms



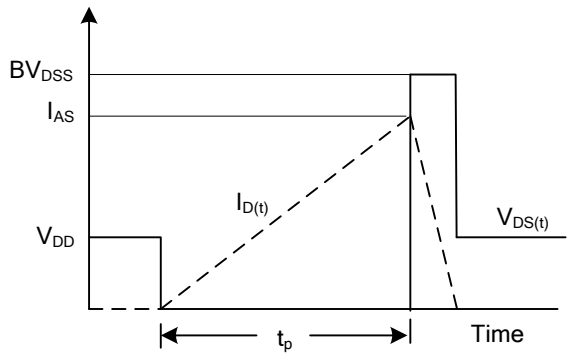
Gate Charge Test Circuit



Gate Charge Waveform



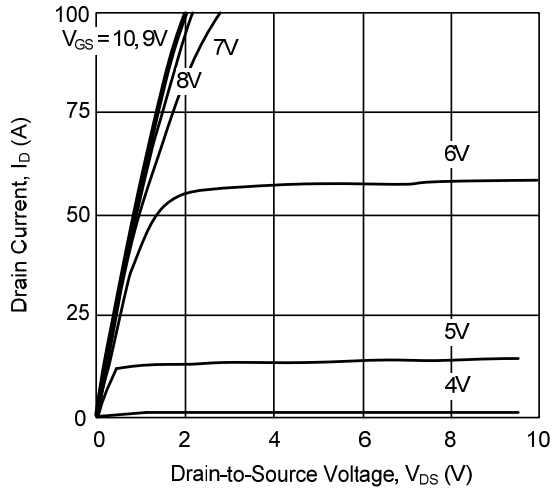
Unclamped Inductive Switching Test Circuit



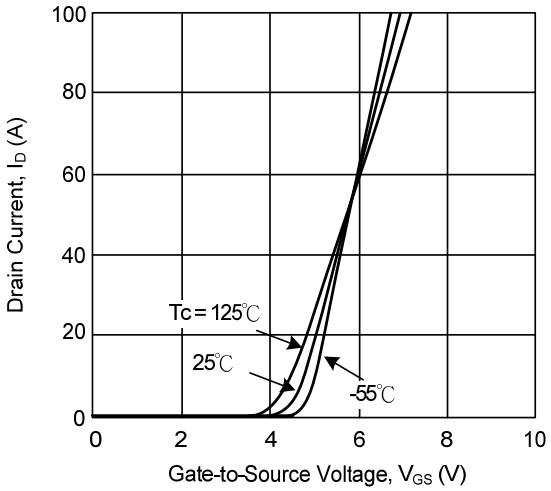
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

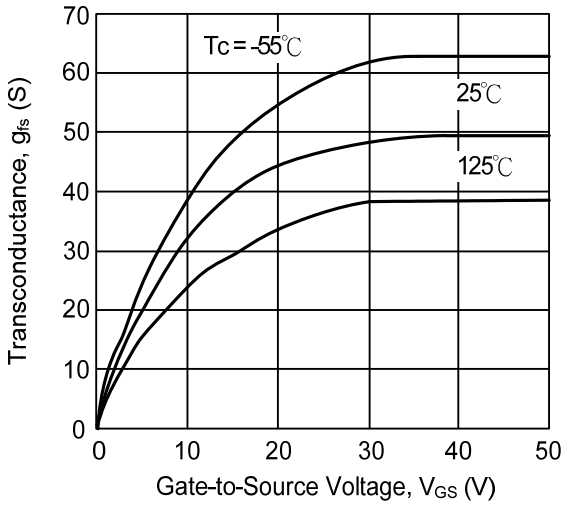
Output Characteristics



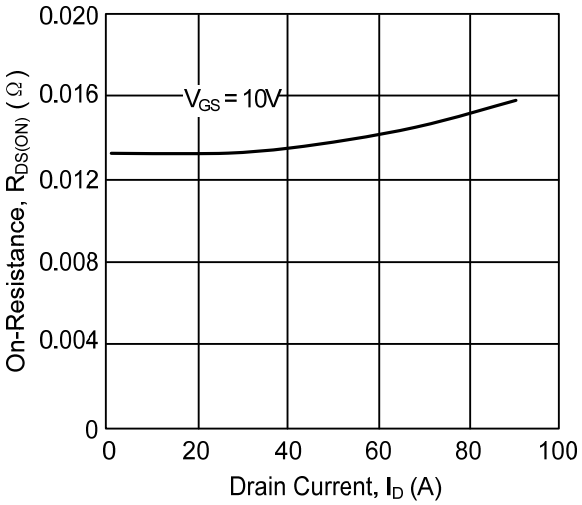
Transfer Characteristics



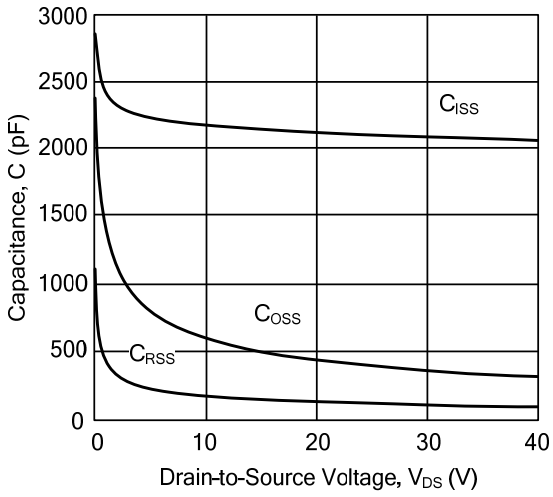
Transconductance



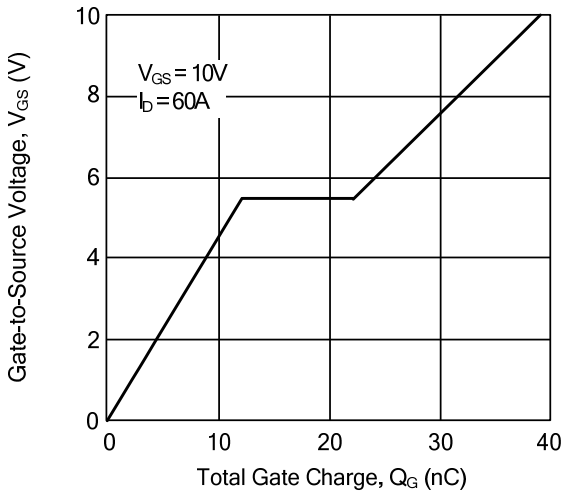
On-Resistance vs. Drain Current



Capacitance

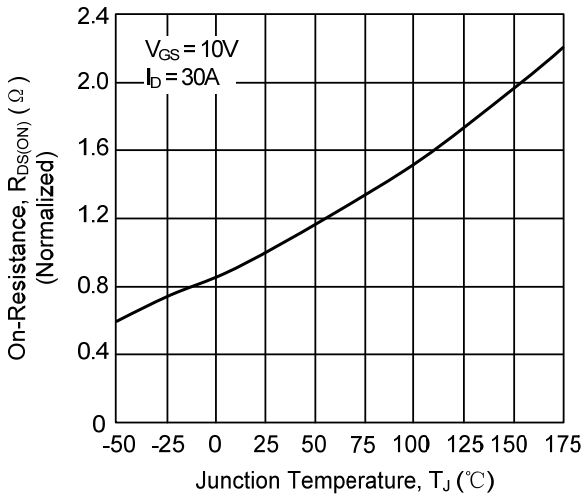


Gate Charge

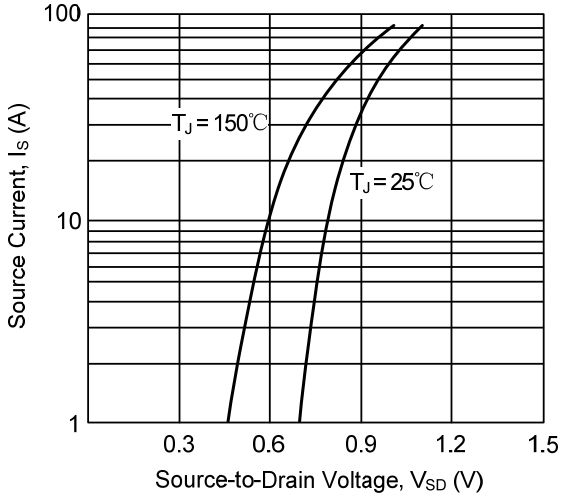


■ TYPICAL CHARACTERISTICS(Cont.)

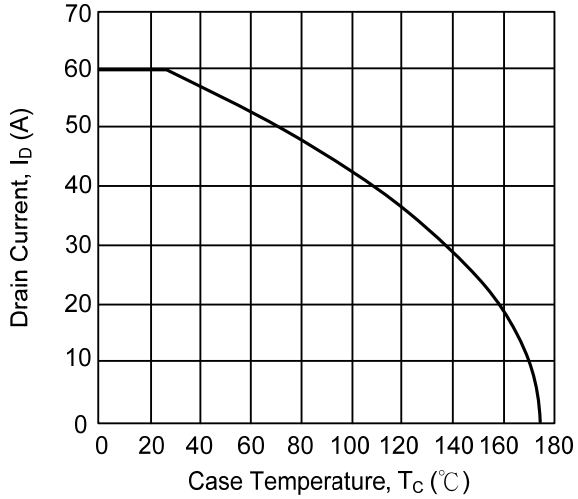
On-Resistance vs. Junction Temperature



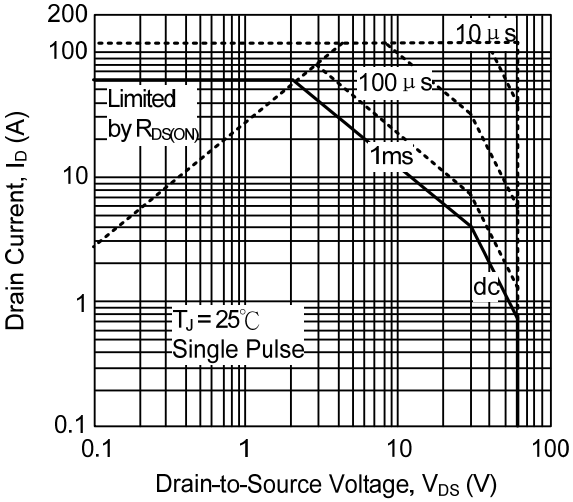
Source-Drain Diode Forward Voltage



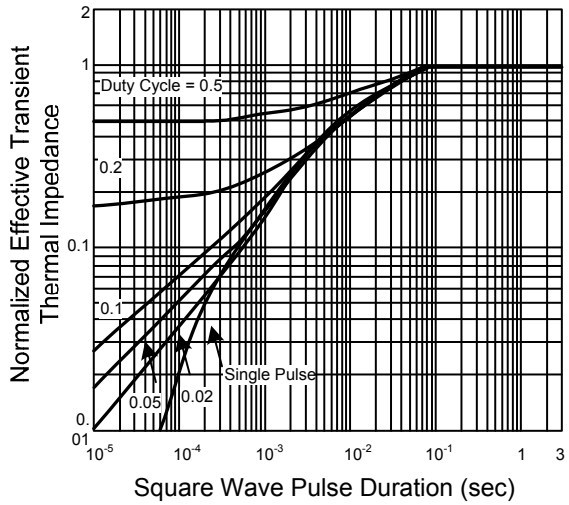
Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance



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