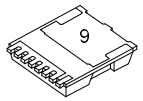
USG15R058HC

POWER MOSFET

N-CHANNEL SGT ENHANCEMENT POWER MOSFET



TOLL-8A

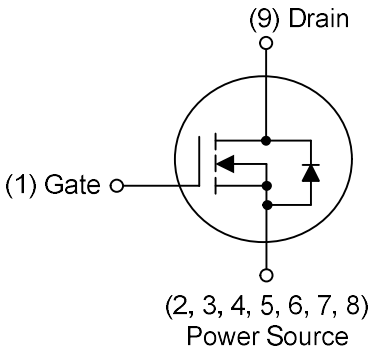
■ DESCRIPTION

The UTC **USG15R058HC** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with low $R_{DS(ON)}$ characteristic by high cell density trench technology.

■ FEATURES

* $R_{DS(ON)} \leq 5.8\ m\Omega$ @ $V_{GS} = 10V$, $I_D = 80A$
* Extremely low on-resistance $R_{DS(ON)}$
* Excellent Low Ciss
* Green Product

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number	Package	Pin Assignment									Packing
		1	2	3	4	5	6	7	8	9	
USG15R058HCG-T8A-R	TOLL-8A	G	S	S	S	S	S	S	S	D	Tape Reel

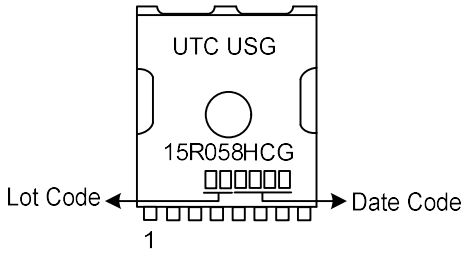
Note: Pin Assignment: G: Gate D: Drain S: Source

USG15R058HCG-T8A-R

(1)Packing Type	(1) R: Tape Reel
(2)Package Type	(2) T8A: TOLL-8A
(3)Green Package	(3) G: Halogen Free and Lead Free

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■ MARKING



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	150	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	140	A
	Pulsed (Note 2)	I_{DM}	280	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	18.3	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	7.2	V/ns
Power Dissipation		P_D	350	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L = 0.1mH, I_{AS} = 19.1A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
4. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 25°C

■ THERMAL DATA

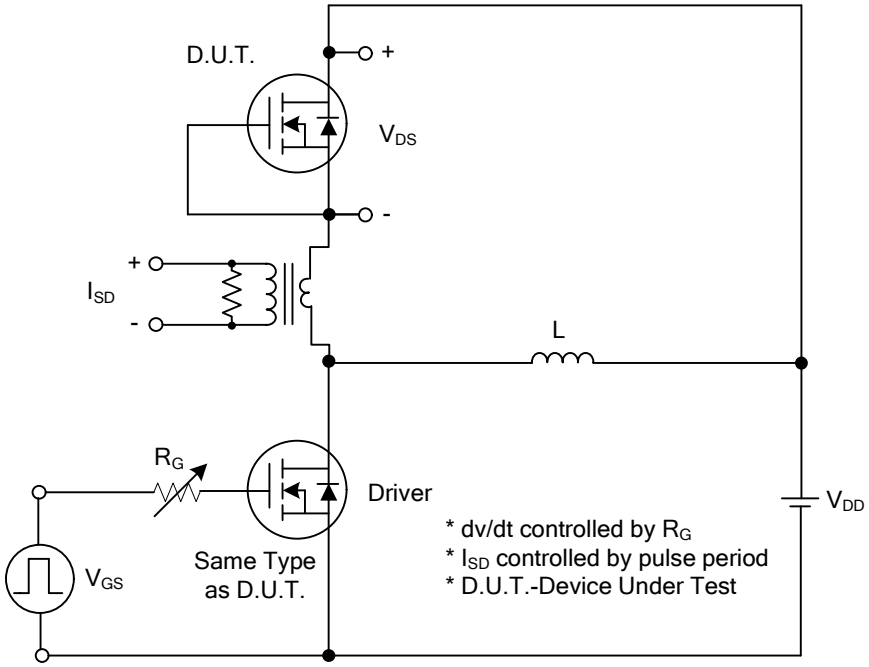
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	35	°C/W
Junction to Case	θ_{JC}	0.35	°C/W

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

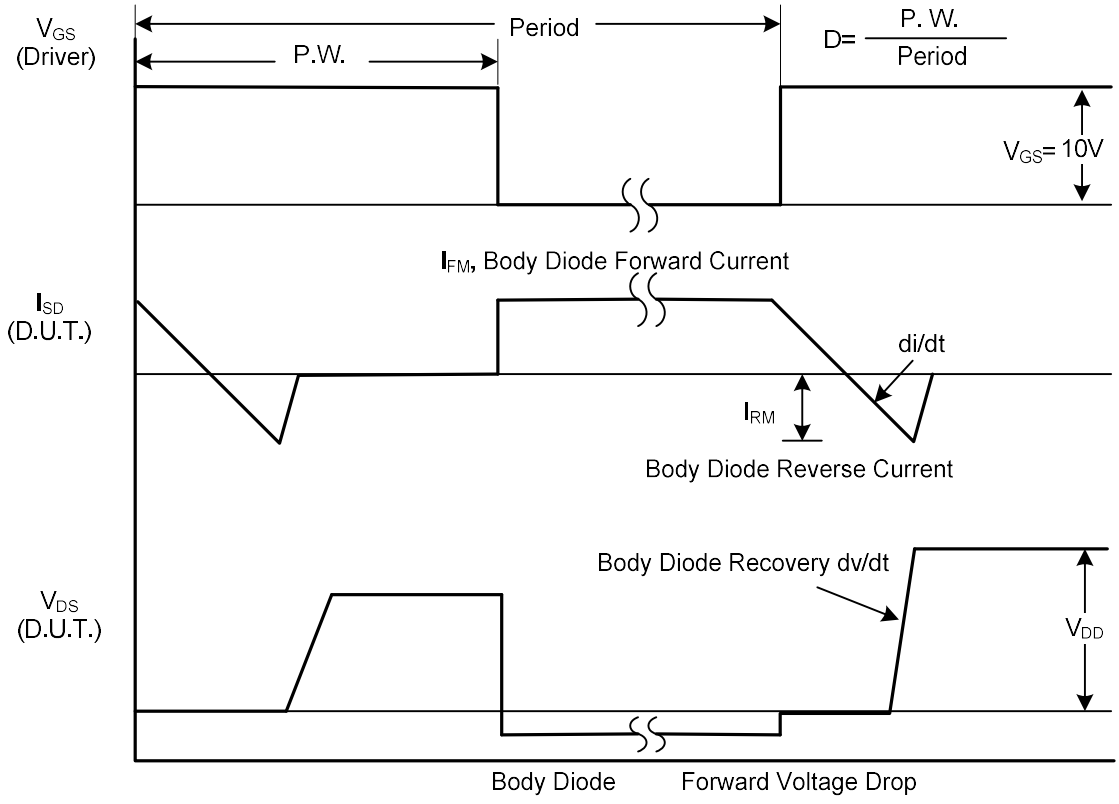
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250μA	150			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=150V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS} =10V, I_D=80A			5.8	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		12.4		nF
Output Capacitance		C_{OSS}			2240		pF
Reverse Transfer Capacitance		C_{RSS}			270		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=120V, V_{GS}=10V, I_D=16A (Note 1, 2)		177		nC
Gate to Source Charge		Q_{GS}			48		nC
Gate to Drain Charge		Q_{GD}			42		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=30V, V_{GS}=10V, I_D=16A, R_G=10Ω (Note 1, 2)		77		ns
Rise Time		t_R			63		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			243		ns
Fall-Time		t_F			50		ns
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I_S				140	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				280	A
Diode Forward Voltage		V_{SD}	I_F=140A, V_{GS}=0V			1.4	V
Reverse Recovery Time (Note 1)		t_{rr}	I_S=30A, V_{GS}=0V, dI_F/dt =100A/μs		96		nS
Reverse Recovery Charge		Q_{rr}			336		nC

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

■ TEST CIRCUITS AND WAVEFORMS

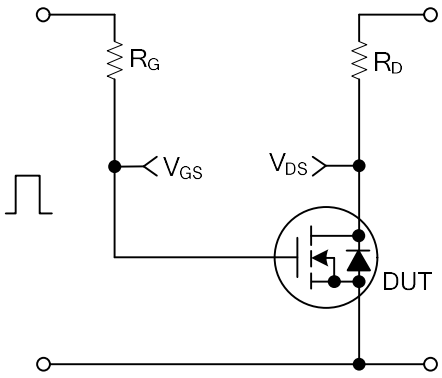


Peak Diode Recovery dv/dt Test Circuit

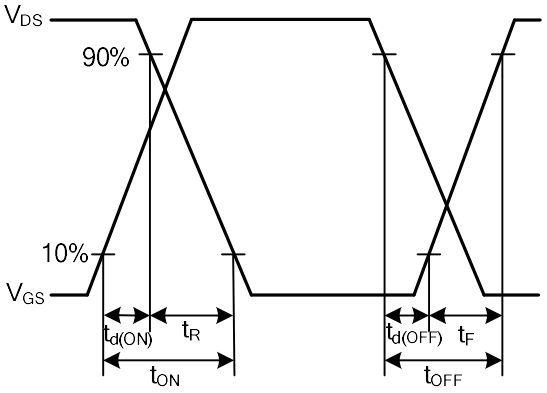


Peak Diode Recovery dv/dt Waveforms

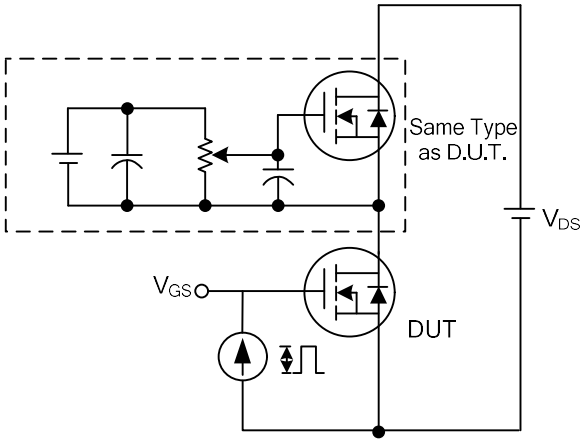
■ TEST CIRCUITS AND WAVEFORMS



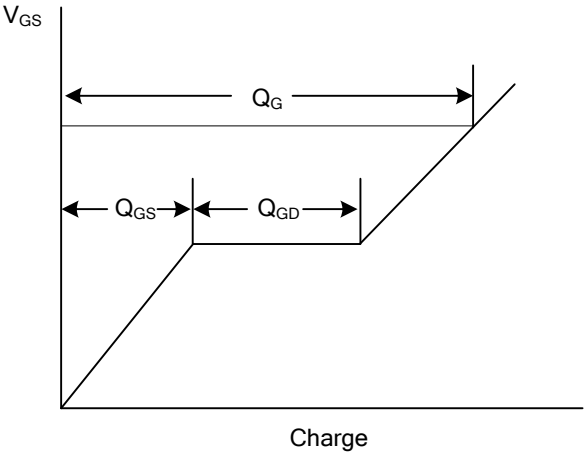
itching Test Circuit



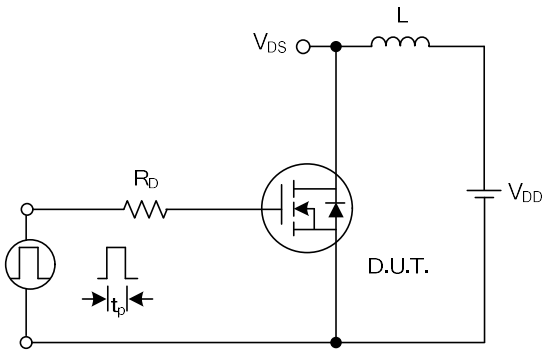
Switching Waveforms



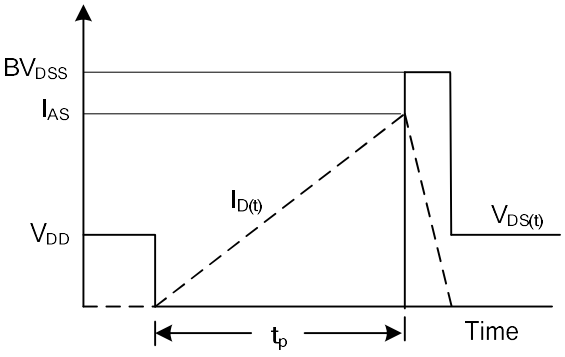
Gate Charge Test Circuit



Gate Charge Waveform



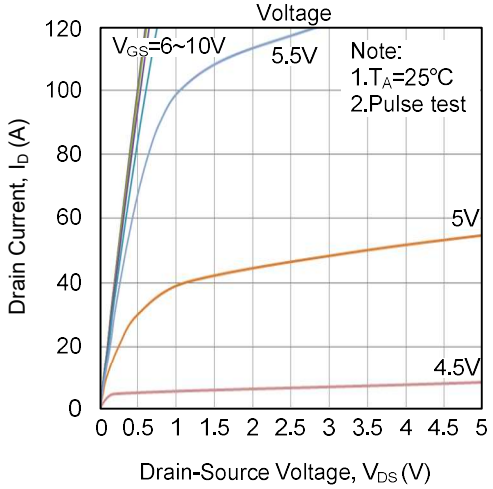
Unclamped Inductive Switching Test Circuit



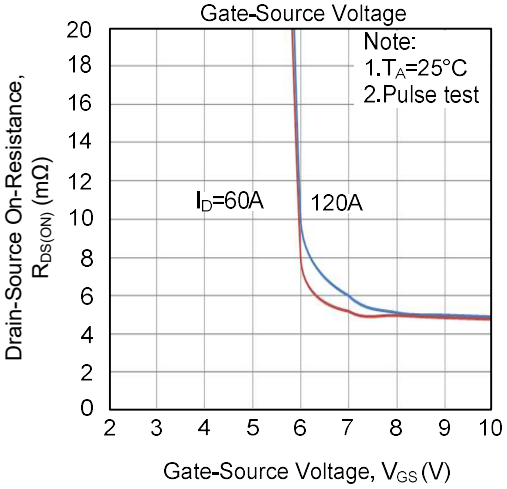
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

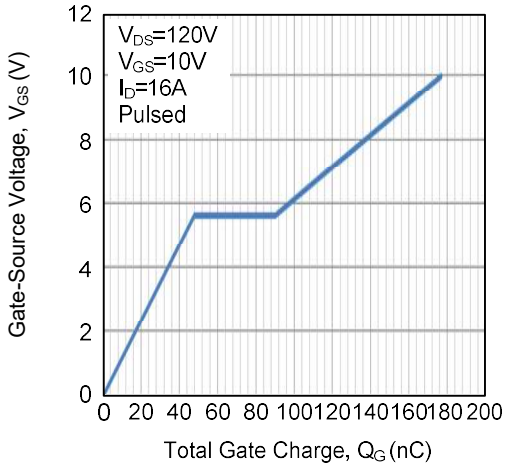
Drain Current vs. Drain-Source Voltage



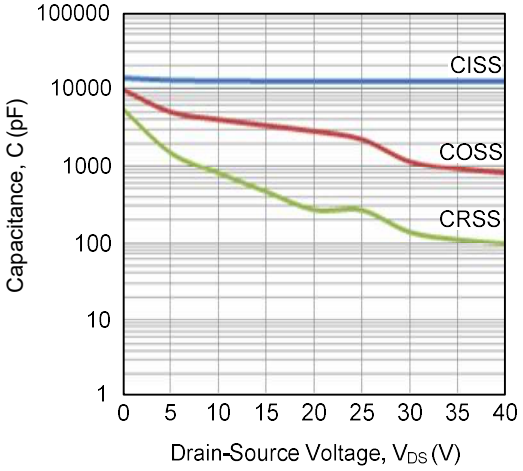
Drain-Source On-Resistance vs. Gate-Source Voltage



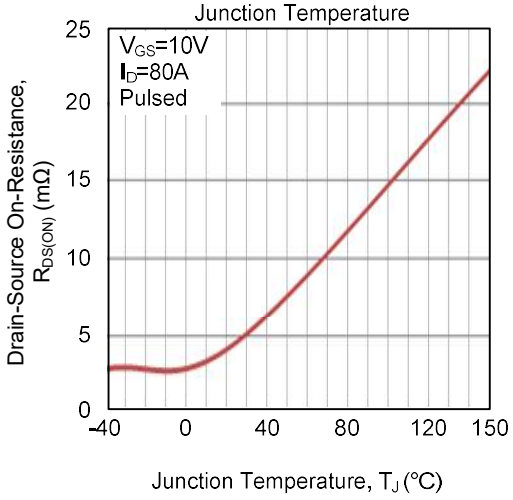
Gate Charge Characteristics



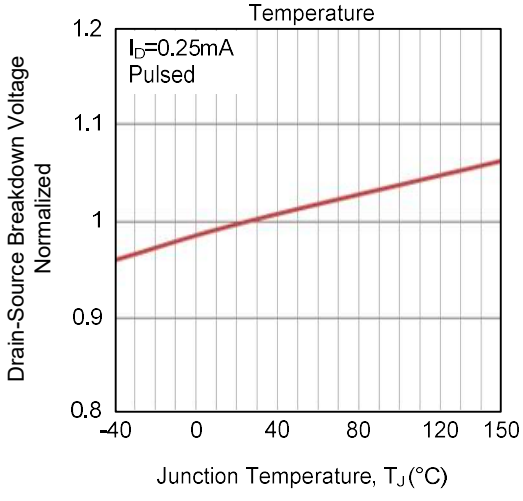
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

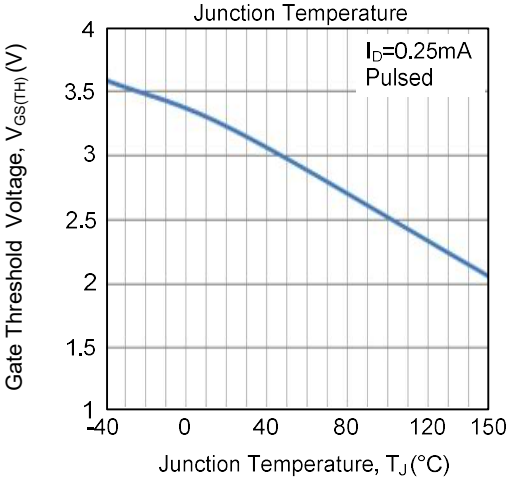


Breakdown Voltage vs. Junction Temperature

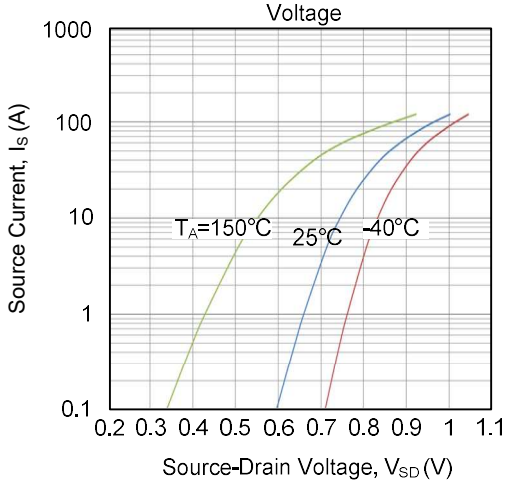


■ TYPICAL CHARACTERISTICS (Cont.)

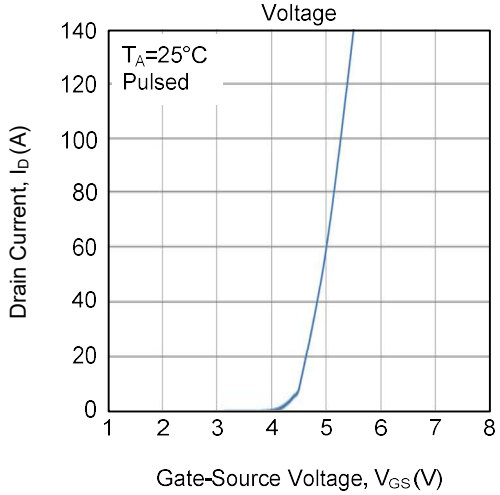
Gate Threshold Voltage vs. Junction Temperature



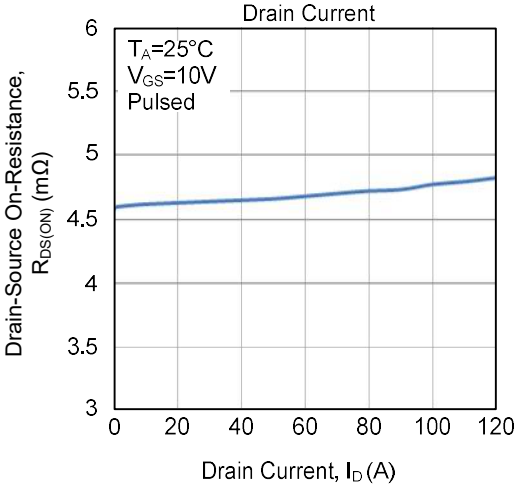
Source Current vs. Source-Drain Voltage



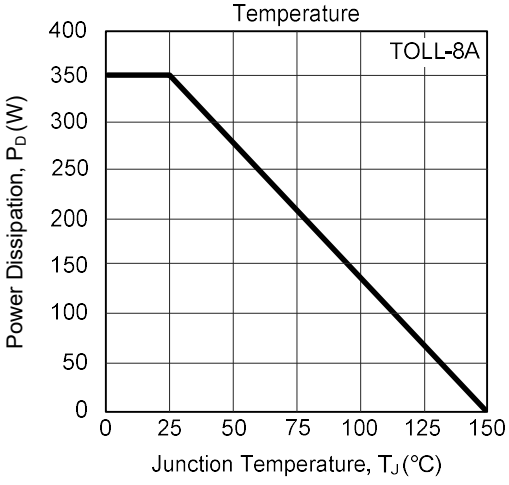
Drain Current vs. Gate-Source Voltage



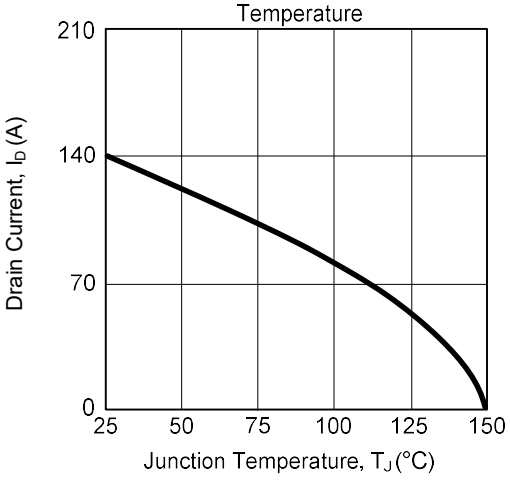
Drain-Source On-Resistance vs. Drain Current



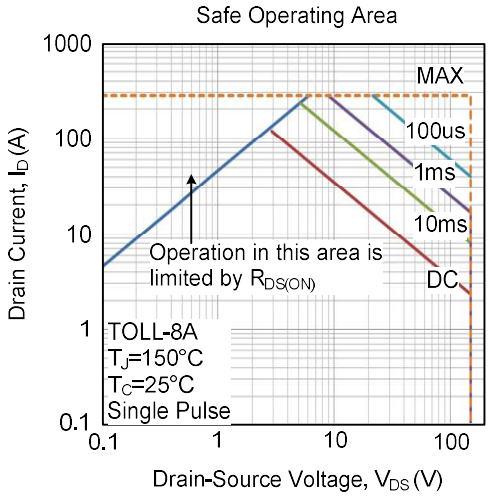
Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)



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