



UT5210

POWER MOSFET

-38A, -100V P-CHANNEL POWER MOSFET

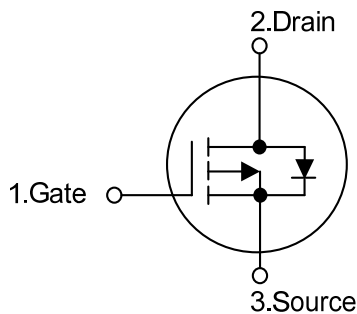
DESCRIPTION

The UTC **UT5210** is a P-channel power MOSFET using UTC's advanced technology to provide customers with a minimum on-state resistance and superior switching performance.

FEATURES

- * $R_{DS(ON)} \leq 60 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -19\text{A}$
- * Advanced Process Technology
- * Ultra Low On-Resistance
- * Fast Switching
- * Repetitive Avalanche Allowed up to T_{J_MAX}

SYMBOL

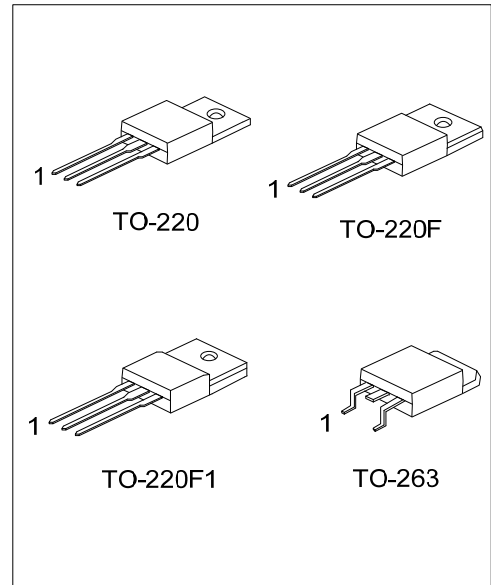


ORDERING INFORMATION

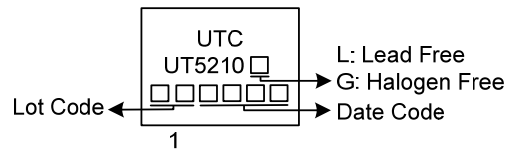
Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UT5210L-TA3-T	UT5210G-TA3-T	TO-220	G	D	S	Tube
UT5210L-TF3-T	UT5210G-TF3-T	TO-220F	G	D	S	Tube
UT5210L-TF1-T	UT5210G-TF1-T	TO-220F1	G	D	S	Tube
UT5210L-TQ2-T	UT5210G-TQ2-T	TO-263	G	D	S	Tube
UT5210L-TQ2-R	UT5210G-TQ2-R	TO-263	G	D	S	Tape Reel

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

UT5210G-TA3-T		(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TF3: TO-220F, TF1: TO-220F1 TQ2: TO-263 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DSS}	-100	V
Gate-Source Voltage			V _{GSS}	±20	V
Drain Current	Continuous	V _{GS} =-10V	I _D	-38	A
	Pulsed (Note 2)		I _{DM}	-140	A
Avalanche Energy	Single Pulse (Note 3)		E _{AS}	60	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	1.98	V/ns
Power Dissipation		TO-220 TO-263	P _D	110	W
		TO-220F TO-220F1		34	W
Junction Temperature			T _J	-55 ~ +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. $L = 0.1\text{ mH}$, $I_{AS} = -34.5\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq -30\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient		θ_{JA}	62.5	°C/W
Junction to Case	TO-220	θ_{JC}	1.13	°C/W
	TO-263			
	TO-220F TO-220F1		3.68	°C/W

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

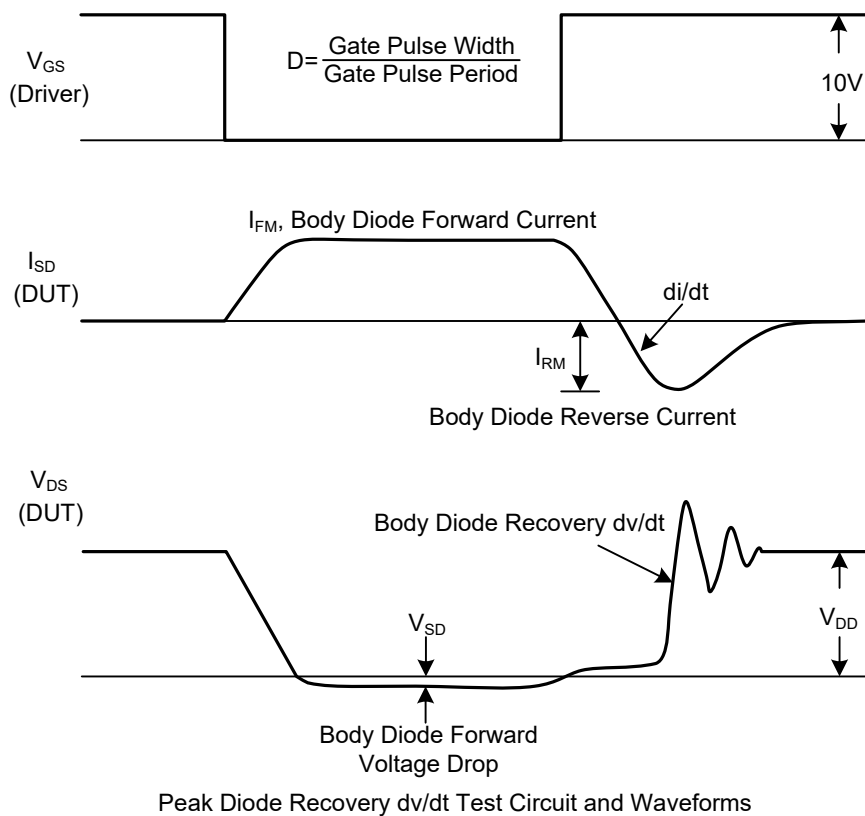
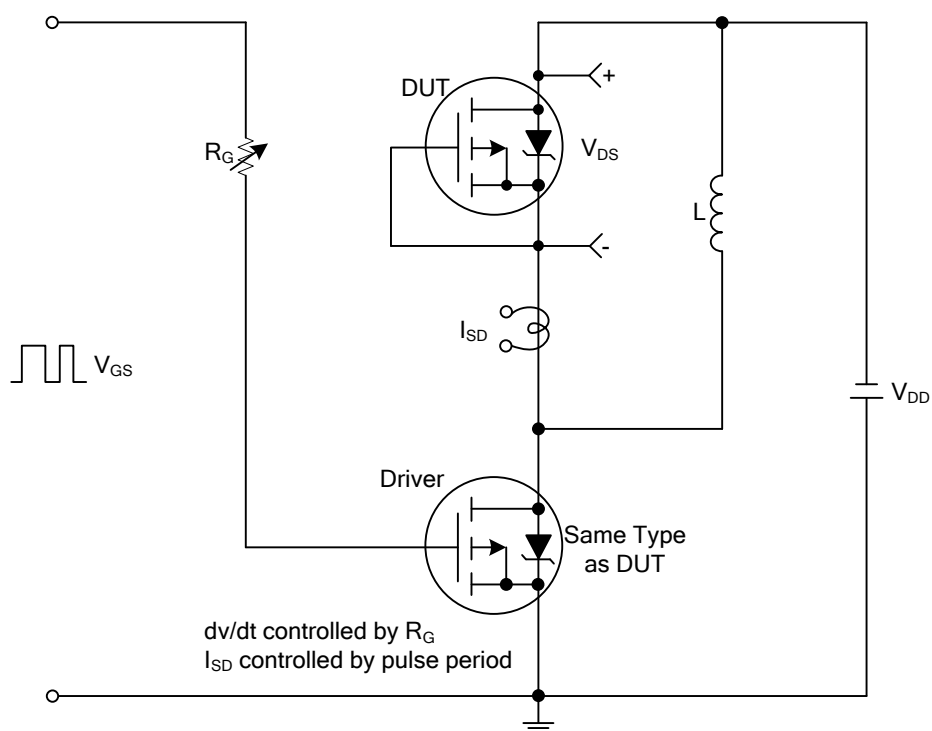
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =-250μA	-100			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-100V, V _{GS} =0V			-1	μA
			V _{DS} =-80V, V _{GS} =0V, T _J =150°C			-250	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-to-Source On-Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-19A			60	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		4050		pF
Output Capacitance		C _{OSS}			220		pF
Reverse Transfer Capacitance		C _{RSS}			173		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q _G	V _{DS} =-80V, V _{GS} =-10V, I _D =-38A (Note 1, 2)		74		nC
Gate-to-Source Charge		Q _{GS}			16		nC
Gate-to-Drain ("Miller") Charge		Q _{GD}			28		nC
Turn-ON Delay Time (Note 1)		t _{D(ON)}	V _{DD} =-50V, V _{GS} =-10Ω, I _D =-38A, R _G =3Ω (Note 1, 2)		19		ns
Rise Time		t _R			25		ns
Turn-OFF Delay Time		t _{D(OFF)}			39		ns
Fall Time		t _F			30		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Continuous Drain-Source Diode Forward Current		I _S				-38	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				-140	A
Drain-Source Diode Forward Voltage (Note 1)		V _{SD}	I _S =-38A, V _{GS} =0V			-1.6	V
Body Diode Reverse Recovery Time		t _{rr}	I _F =-30A, di/dt=-100A/μs, V _{GS} =0V		93		ns
Body Diode Reverse Recovery Charge		Q _{rr}			188		nC

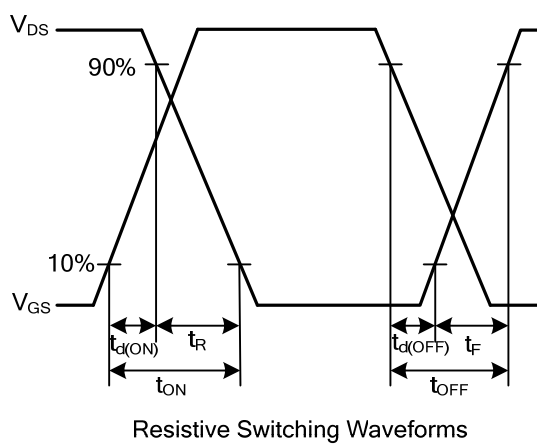
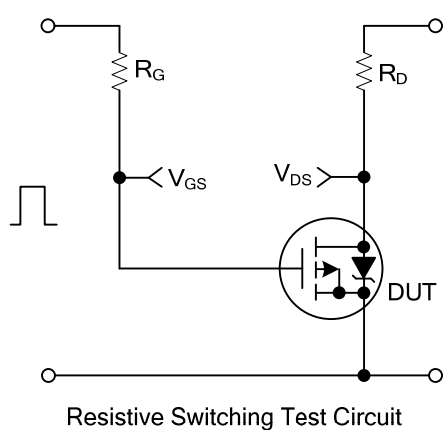
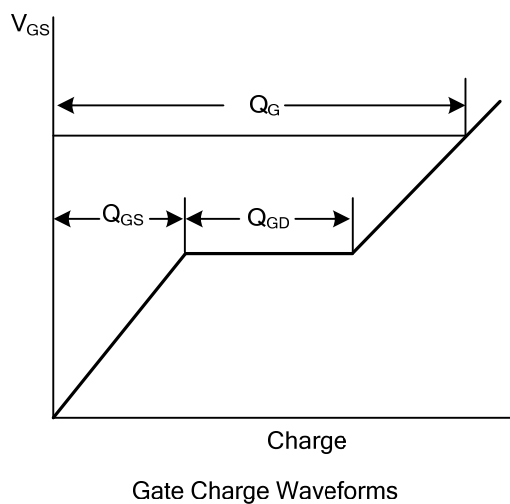
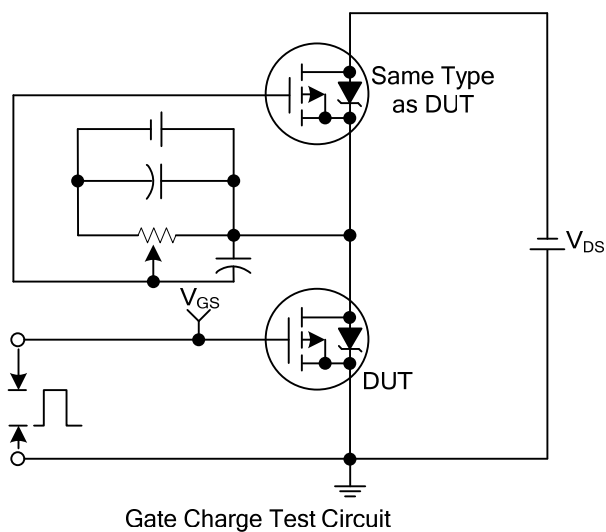
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

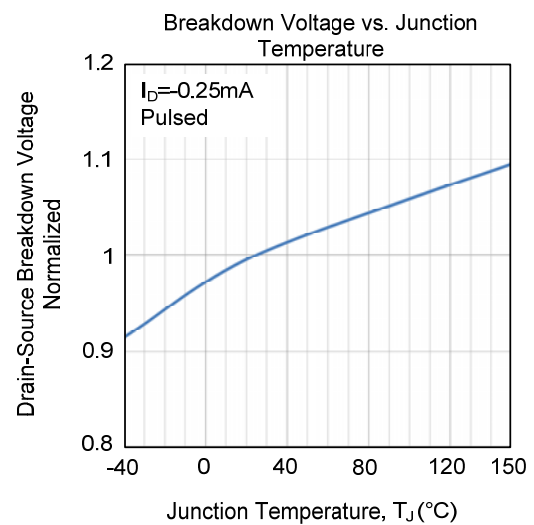
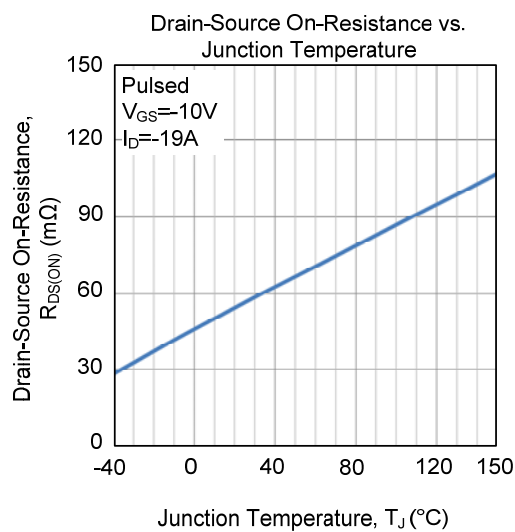
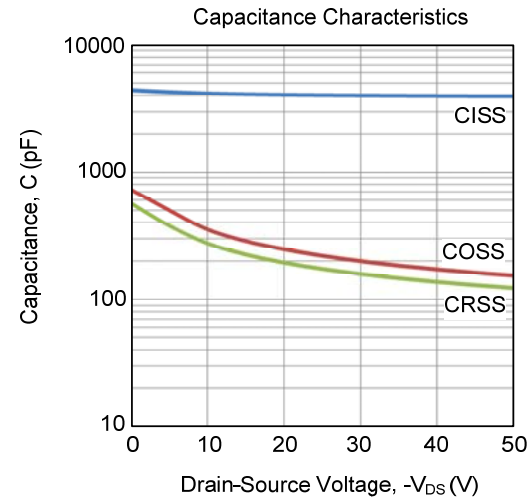
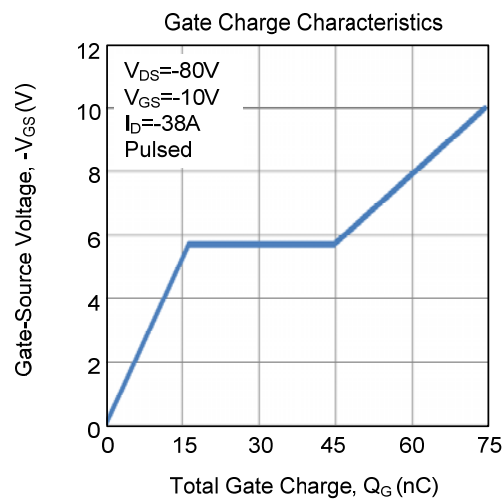
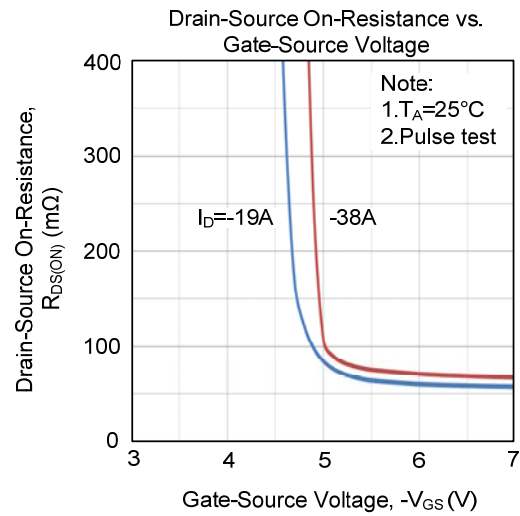
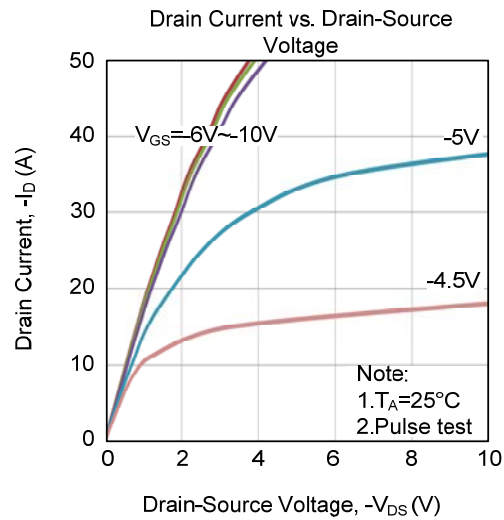
■ TEST CIRCUITS AND WAVEFORMS



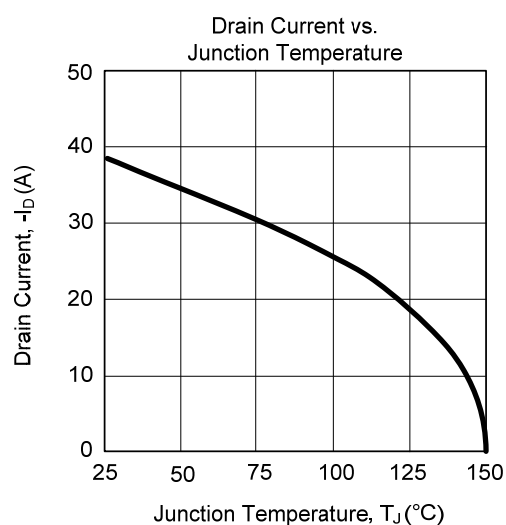
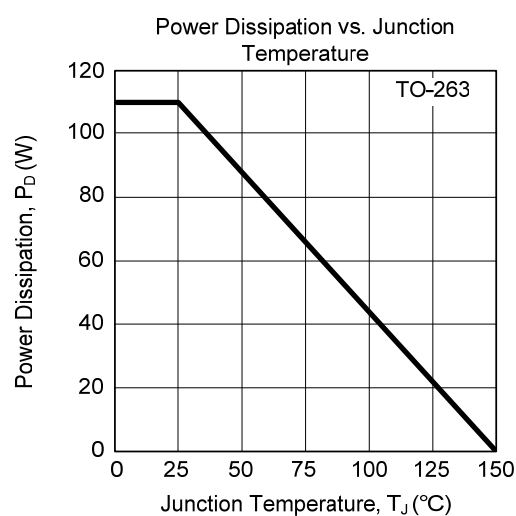
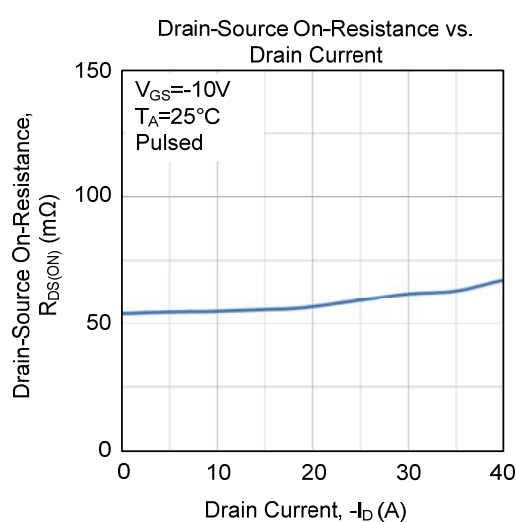
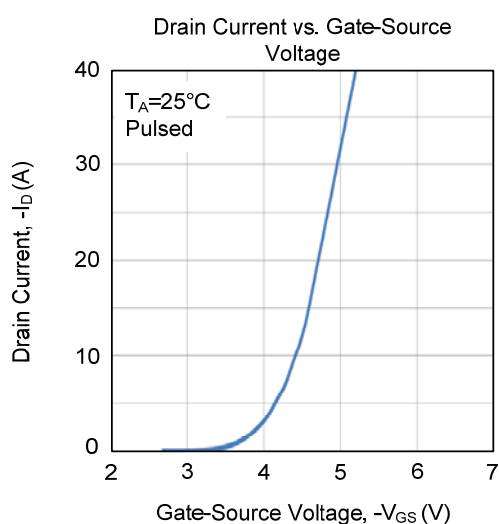
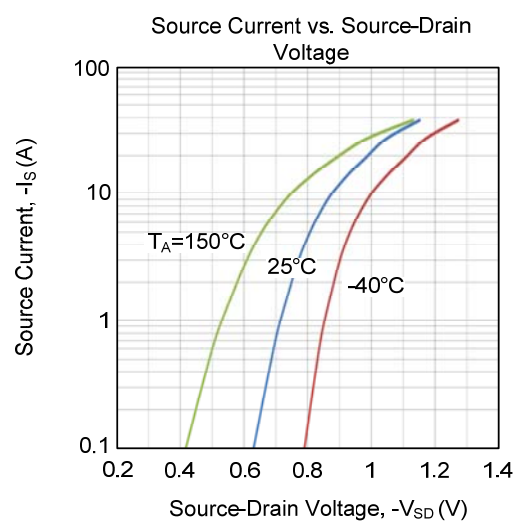
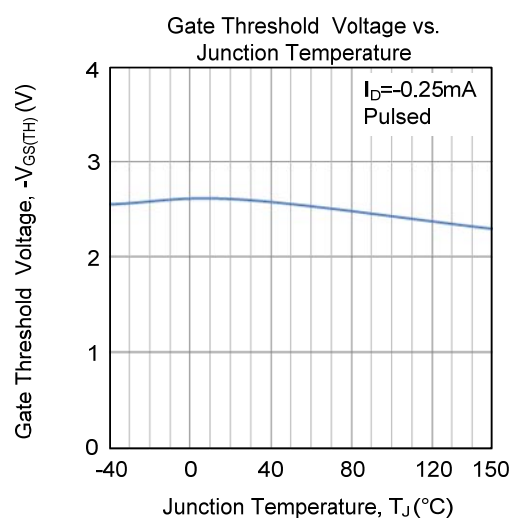
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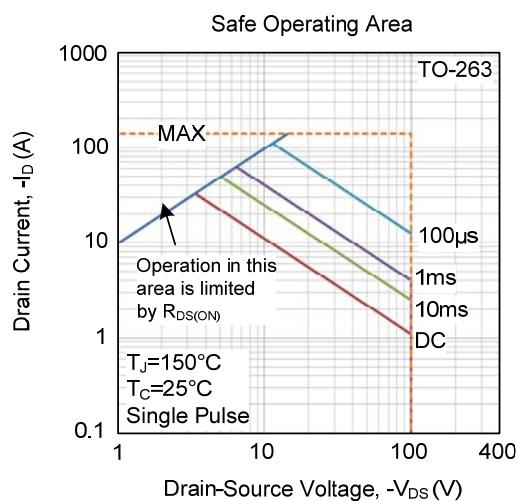
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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