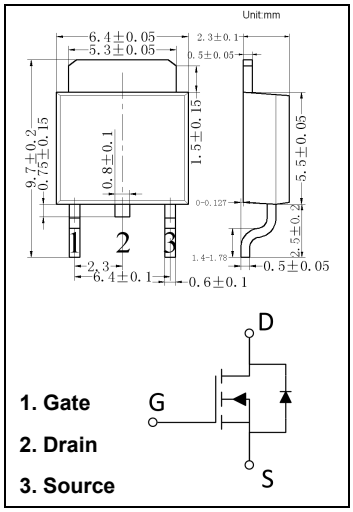
TO-252 Plastic-Encapsulate MOSFETS

LJU40N10

N-Channel 100-V (D-S) MOSFET



PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.030 at V_{GS} = 10 V	40
	0.034 at V_{GS} = 6 V	37.5

FEATURES

- TrenchFET® Power MOSFETS
- 175 °C Junction Temperature
- Low Thermal Resistance Package

ABSOLUTE MAXIMUM RATINGS T_C = 25 °C, unless otherwise noted				
Symbol	**Parameter**		**Limit**	**Unit**
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		± 20	
I_D	Continuous Drain Current (T_J = 175 °C)	T_C = 25 °C	40	A
		T_C = 125 °C	23	
I_{DM}	Pulsed Drain Current		75	
I_{AR}	Avalanche Current		35	
E_{AR}	Repetitive Avalanche Energy[a]	L = 0.1 mH	61	mJ
P_D	Maximum Power Dissipation[a]	T_C = 25 °C	107[b]	W
		T_A = 25 °C[c]	3.75	
T_J, T_{stg}	Operating Junction and Storage Temperature Range		- 55 to 175	°C

THERMAL RESISTANCE RATINGS				
Symbol	**Parameter**		**Limit**	**Unit**
R_{thJA}	Junction-to-Ambient	(PCB Mount)[c]	40	°C/W
R_{thJC}	Junction-to-Case (Drain)		1.4	

Notes:
a. Duty cycle ≤ 1 %.
b. See SOA curve for voltage derating.
c. When Mounted on 1" square PCB (FR-4 material).

* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Symbol	**Parameter**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{SS} = 0 V, I_D = 250 µA	100			V
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 µA	1.1	1.7	2.5	
I_{GSS}	Gate-Body Leakage	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80 V, V_{GS} = 0 V			1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 175 °C			250	
$I_{D(on)}$	On-State Drain Current[a]	$V_{DS} \geq$ 5 V, V_{GS} = 10 V	75			A
$r_{DS(on)}$	Drain-Source On-State Resistance[a]	V_{GS} = 10 V, I_D = 15 A		0.024	0.030	Ω
		V_{GS} = 6 V, I_D = 10 A		0.026	0.034	
		V_{GS} = 10 V, I_D = 15 A, T_J = 125 °C			0.054	
		V_{GS} = 10 V, I_D = 15 A, T_J = 175 °C			0.067	
g_{fs}	Forward Transconductance[a]	V_{DS} = 15 V, I_D = 15 A	10			S
Dynamic[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		2400		pF
C_{oss}	Output Capacitance			270		
C_{rss}	Reverse Transfer Capacitance			90		
Q_g	Total Gate Charge[c]	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 40 A		35	60	nC
Q_{gs}	Gate-Source Charge[c]			11		
Q_{gd}	Gate-Drain Charge[c]			9		
R_G	Gate Resistance			1.7		Ω
$t_{d(on)}$	Turn-On Delay Time[c]	V_{DD} = 50 V, R_L = 1.25 Ω $I_D \cong$ 40 A, V_{GEN} = 10 V, R_G = 2.5 Ω		11	20	ns
t_r	Rise Time[c]			12	20	
$t_{d(off)}$	Turn-Off Delay Time[c]			30	45	
t_f	Fall Time[c]			12	20	
Source-Drain Diode Ratings and Characteristics T_C = 25 °C[b]						
I_S	Continuous Current				40	A
I_{SM}	Pulsed Current				75	
V_{SD}	Forward Voltage[a]	I_F = 30 A, V_{GS} = 0 V		1.0	1.5	V
t_{rr}	Reverse Recovery Time	I_F = 30 A, di/dt = 100 A/µs		60	100	ns
$I_{RM(REC)}$	Peak Reverse Recovery Current			5	8	A
Q_{rr}	Reverse Recovery Charge			0.15	0.4	µC

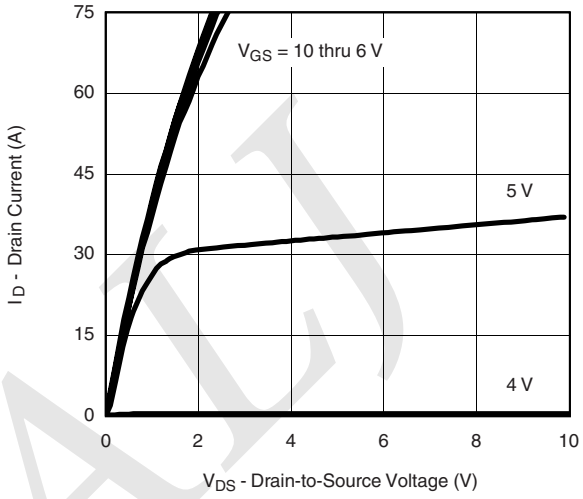
Notes:

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %

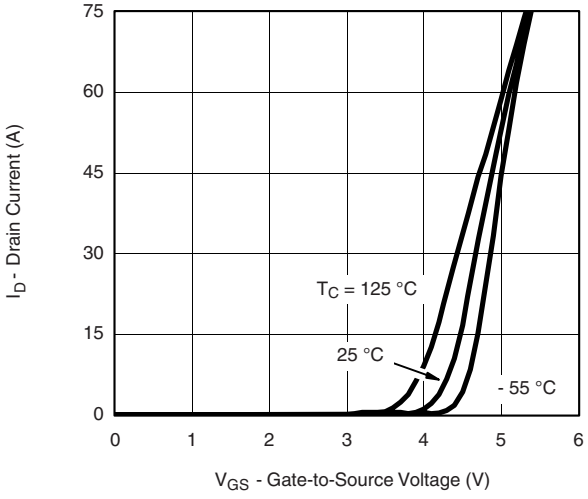
b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

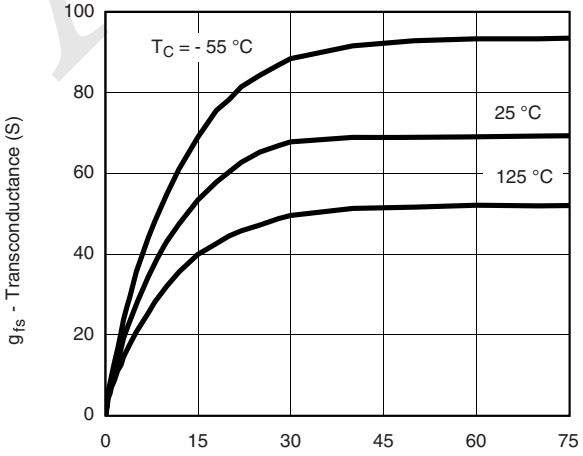
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



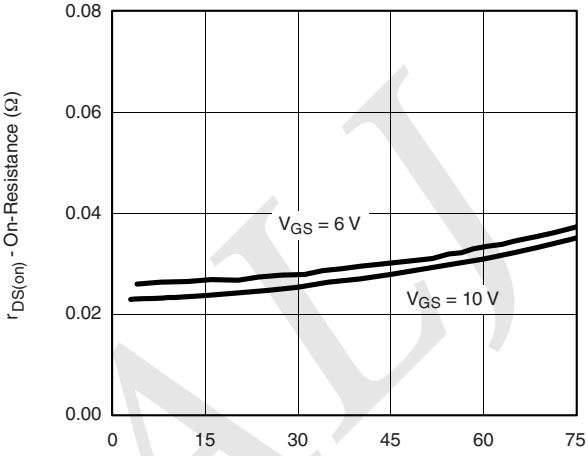
Output Characteristics



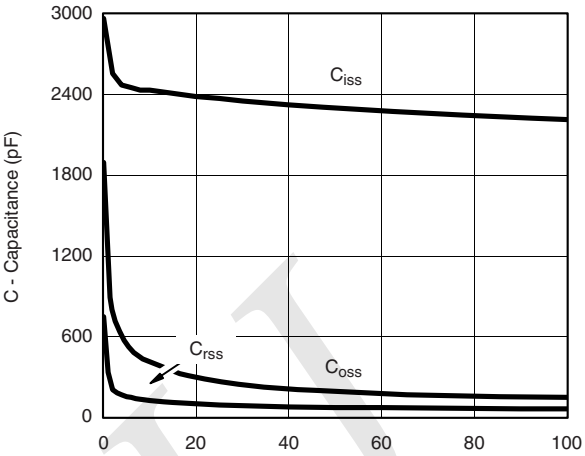
Transfer Characteristics



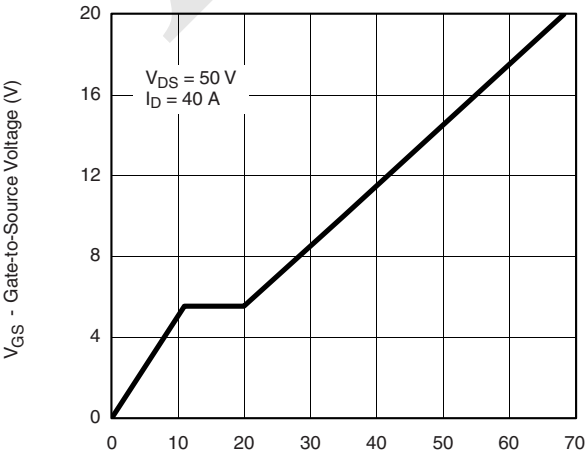
Transconductance



On-Resistance vs. Drain Current

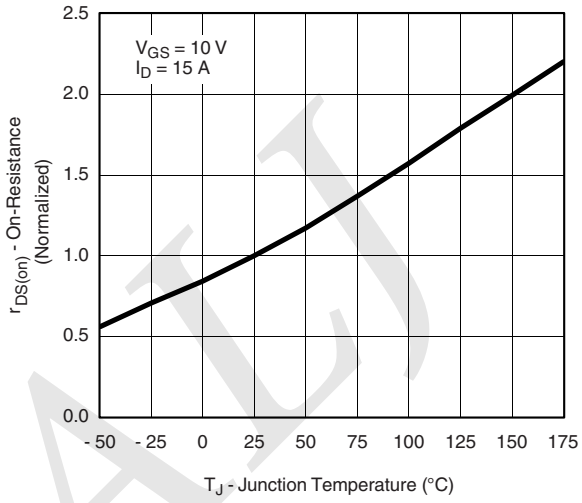


Capacitance

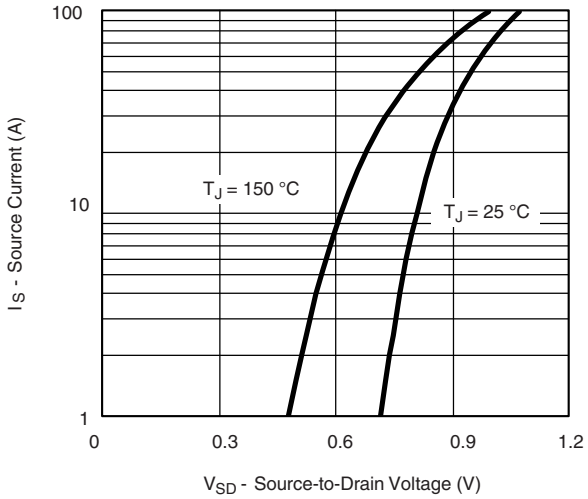


Gate Charge

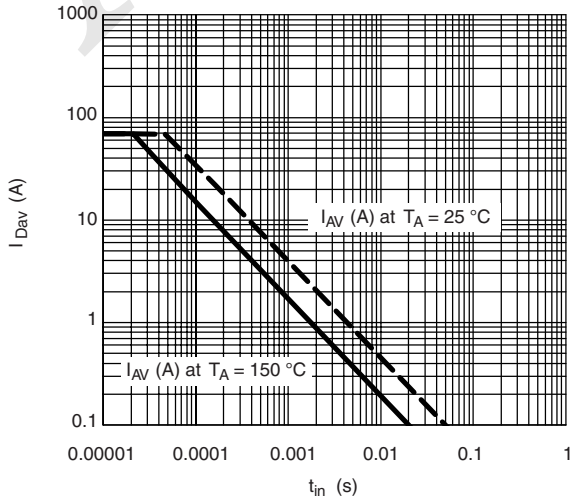
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



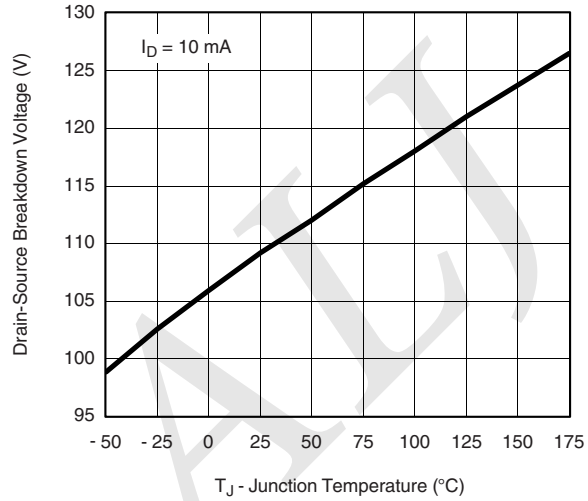
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

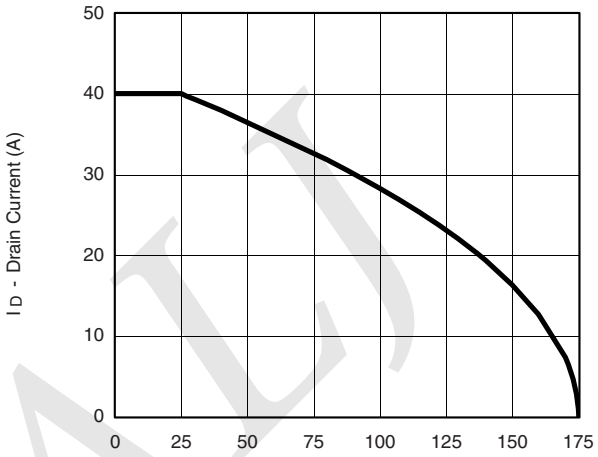


Avalanche Current vs. Time

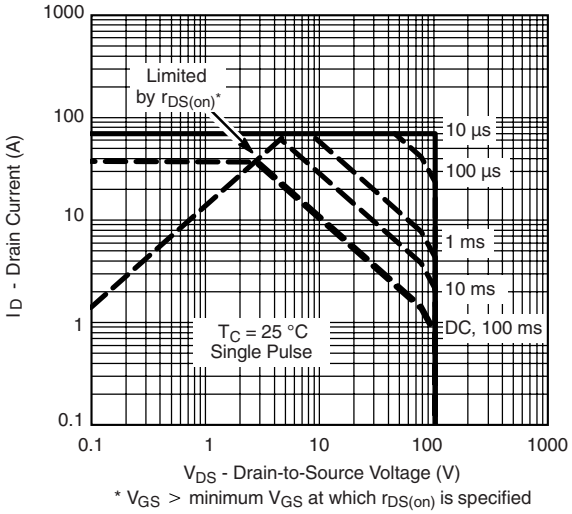


Drain-Source Breakdown Voltage vs. Junction Temperature

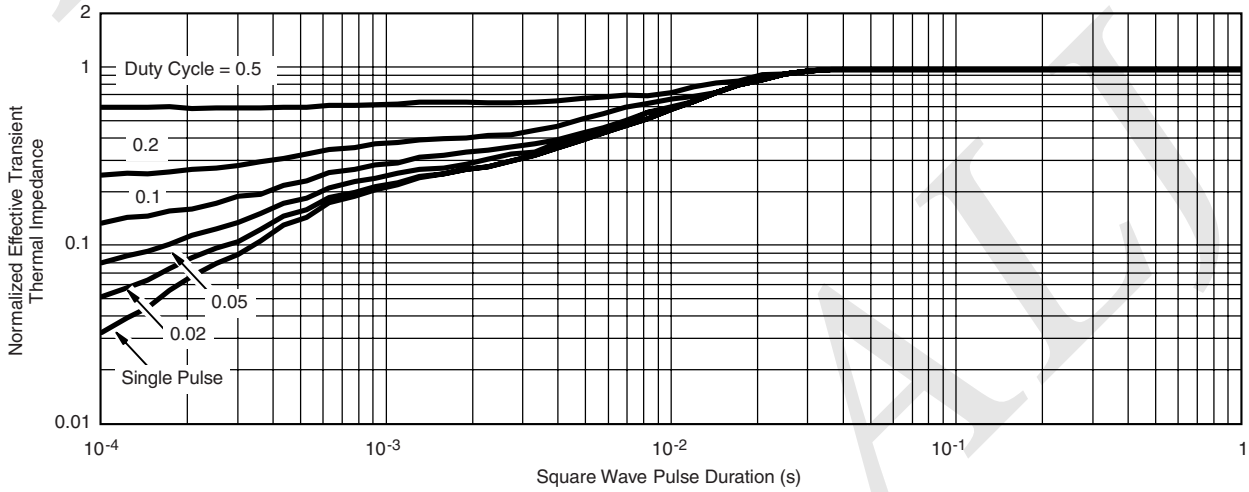
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case