

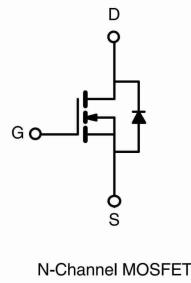
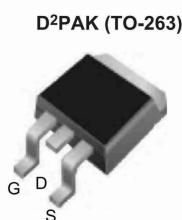
CSD19536KTT-VB Datasheet

100V Trench TO263 Single-N MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	100
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.0030
I_D (A) ^a	180
Configuration	Single

FEATURES

- TrenchFET® Power MOSFET
- Package with Low Thermal Resistance
- 100 % R_g and UIS Tested



ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	100	
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	180	
		140	
Continuous Source Current (Diode Conduction) ^a	I_S	180	A
Pulsed Drain Current ^b	I_{DM}	680	
Single Pulse Avalanche Current	I_{AS}	73	
Single Pulse Avalanche Energy	E_{AS}	266	mJ
Maximum Power Dissipation ^b	P_D	375	W
		125	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 175	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	R_{thJA}	40	
Junction-to-Case (Drain)	R_{thJC}	0.6	°C/W

Notes

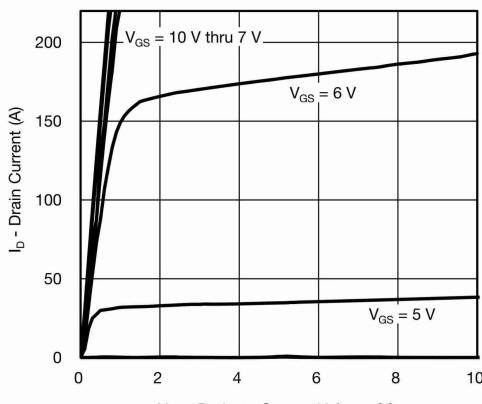
- Base on $T_c = 25$ °C.
- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.

SPECIFICATIONS ($T_C = 25^\circ\text{C}$, unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
Static								
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0$, $I_D = 250 \mu\text{A}$		100	-	-	V	
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$		2.5	3.0	3.5		
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$		-	-	± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0 \text{ V}$	$V_{DS} = 100 \text{ V}$	-	-	1	μA	
		$V_{GS} = 0 \text{ V}$	$V_{DS} = 100 \text{ V}$, $T_J = 125^\circ\text{C}$	-	-	50		
		$V_{GS} = 0 \text{ V}$	$V_{DS} = 100 \text{ V}$, $T_J = 175^\circ\text{C}$	-	-	500		
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{GS} = 10 \text{ V}$	$V_{DS} \geq 5 \text{ V}$	120	-	-	A	
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$	$I_D = 20 \text{ A}$	-	0.0030	-	Ω	
		$V_{GS} = 10 \text{ V}$	$I_D = 20 \text{ A}$, $T_J = 125^\circ\text{C}$	-	0.0064	-		
		$V_{GS} = 10 \text{ V}$	$I_D = 20 \text{ A}$, $T_J = 175^\circ\text{C}$	-	0.0080	-		
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15 \text{ V}$, $I_D = 20 \text{ A}$		-	82	-	S	
Dynamic^b								
Input Capacitance	C_{iss}	$V_{GS} = 0 \text{ V}$	$V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$	-	5780	7230	pF	
Output Capacitance	C_{oss}			-	3070	3840		
Reverse Transfer Capacitance	C_{rss}			-	305	385		
Total Gate Charge ^c	Q_g	$V_{GS} = 10 \text{ V}$	$V_{DS} = 50 \text{ V}$, $I_D = 70 \text{ A}$	-	125	190	nC	
Gate-Source Charge ^c	Q_{gs}			-	28	-		
Gate-Drain Charge ^c	Q_{gd}			-	46	-		
Gate Resistance	R_g	$f = 1 \text{ MHz}$		1.6	3.3	5	Ω	
Turn-On Delay Time ^c	$t_{d(\text{on})}$	$V_{DD} = 50 \text{ V}$, $R_L = 0.7 \Omega$ $I_D \geq 70 \text{ A}$, $V_{GEN} = 10 \text{ V}$, $R_g = 1 \Omega$		-	16	25	ns	
Rise Time ^c	t_r			-	110	165		
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			-	40	60		
Fall Time ^c	t_f			-	12	20		
Source-Drain Diode Ratings and Characteristics^b								
Pulsed Current ^a	I_{SM}			-	-	480	A	
Forward Voltage	V_{SD}	$I_F = 100 \text{ A}$, $V_{GS} = 0$		-	0.9	1.5	V	

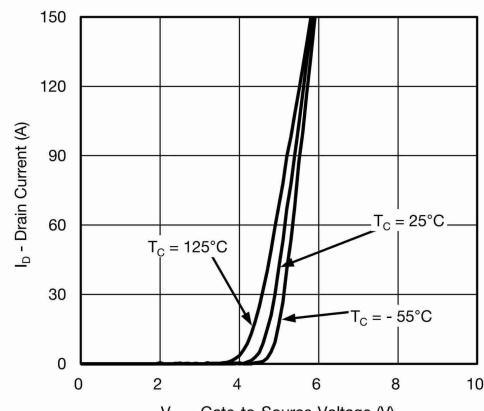
Notes

- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

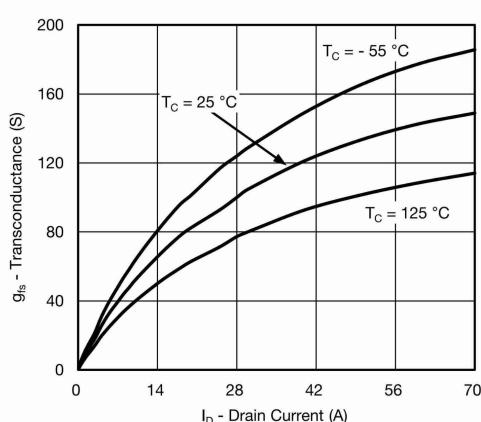
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)


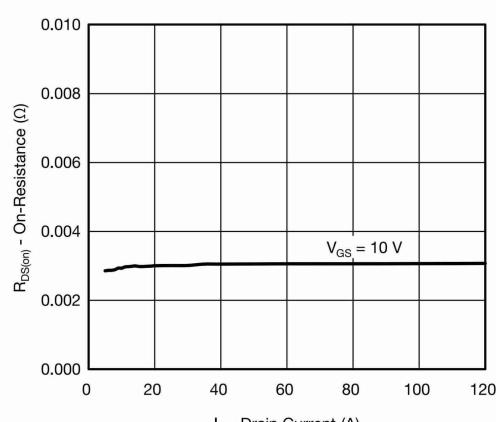
Output Characteristics



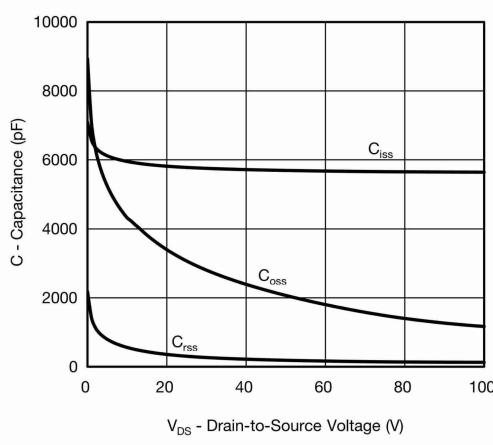
Transfer Characteristics



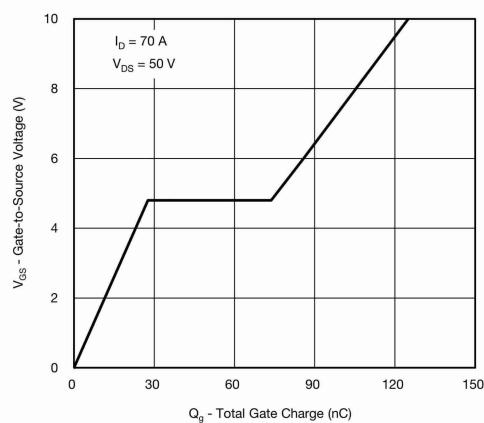
Transconductance



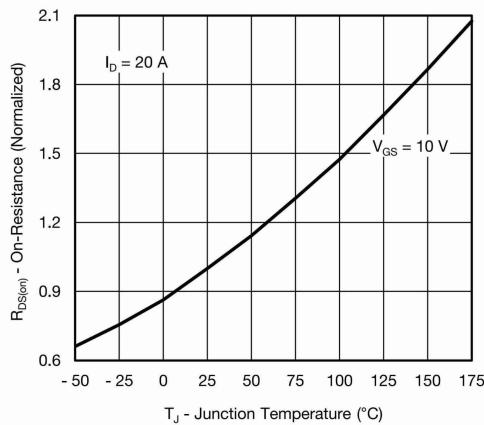
On-Resistance vs. Drain Current



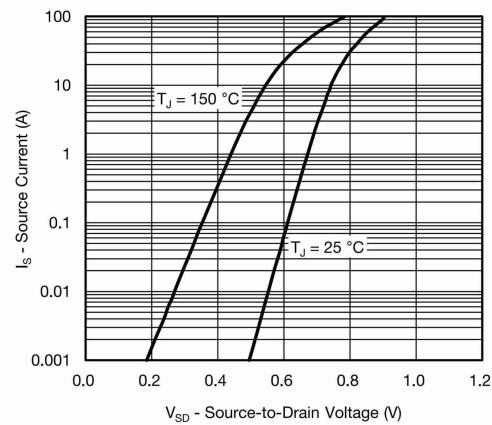
Capacitance



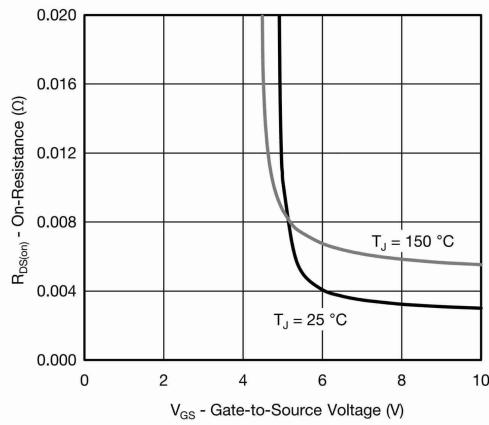
Gate Charge

TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise noted)


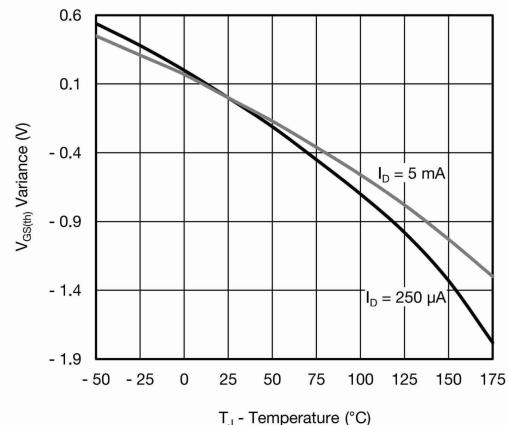
On-Resistance vs. Junction Temperature



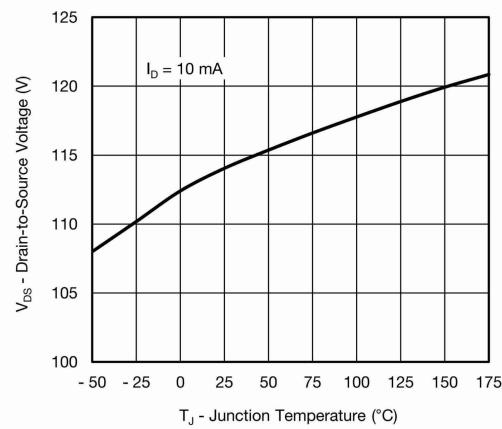
Source Drain Diode Forward Voltage



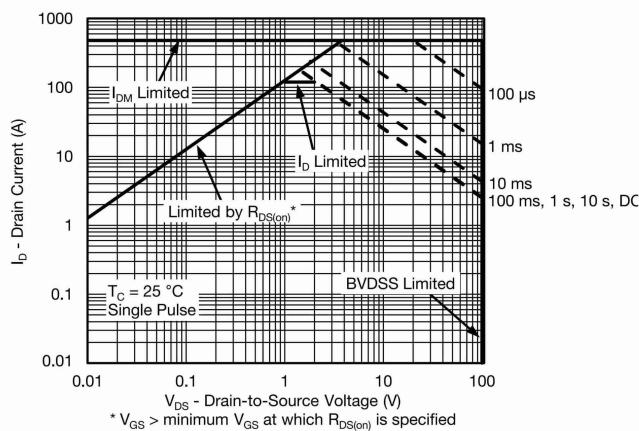
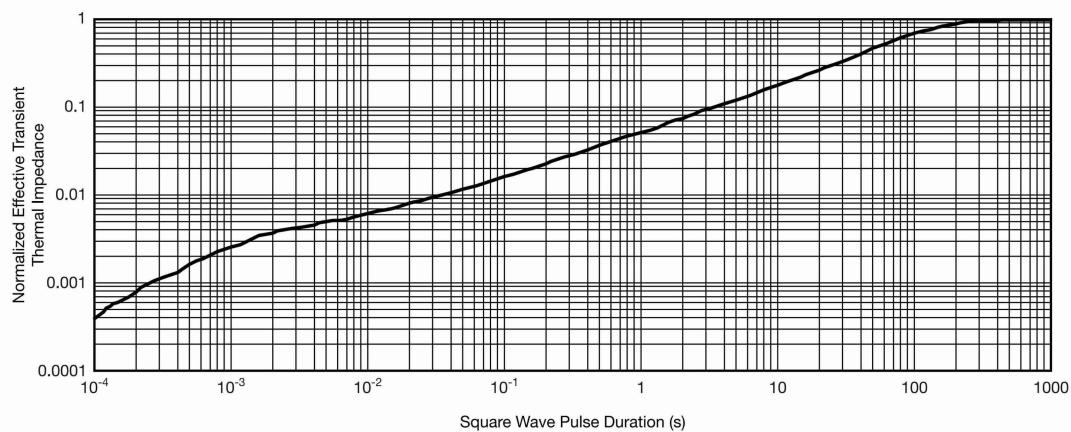
On-Resistance vs. Gate-to-Source Voltage

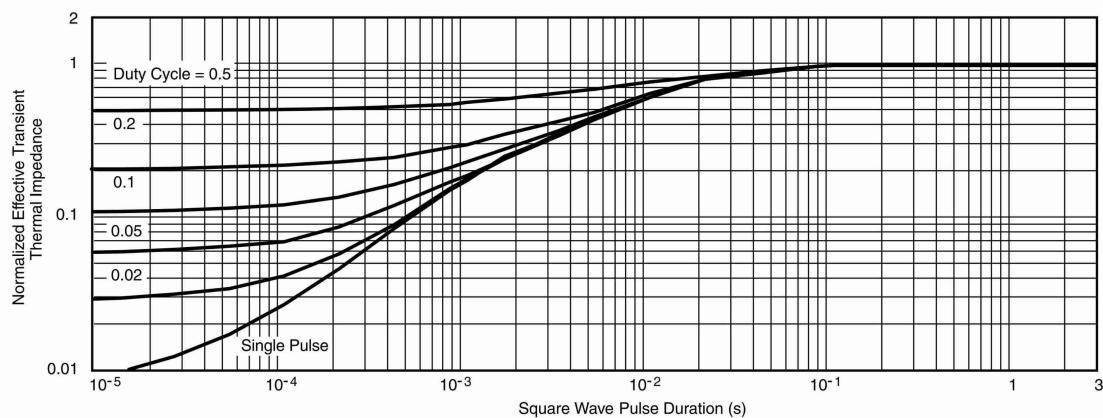


Threshold Voltage



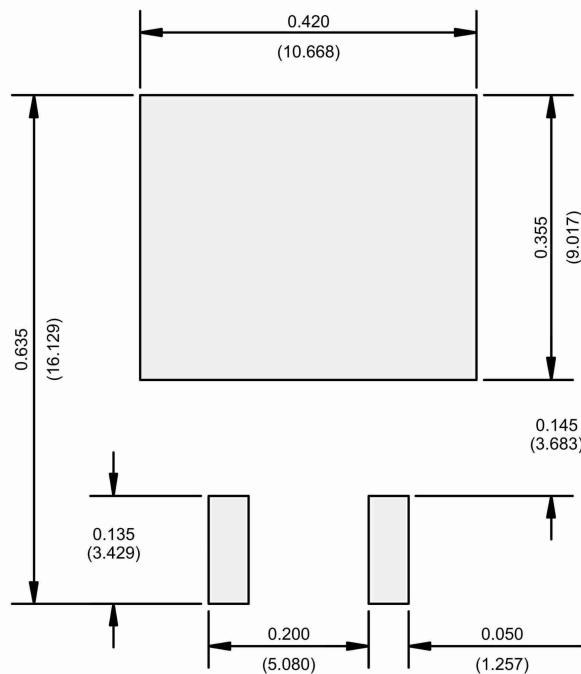
Drain Source Breakdown vs. Junction Temperature

THERMAL RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Ambient

THERMAL RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Case
Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction to Ambient (25°C)
 - Normalized Transient Thermal Impedance Junction to Case (25°C)

are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead

Recommended Minimum Pads
Dimensions in Inches/(mm)

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