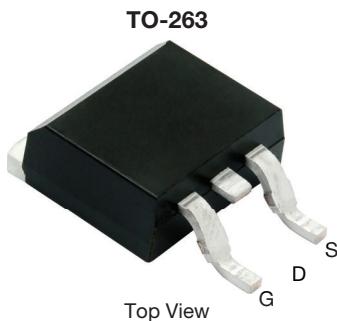


N-Channel 200 V (D-S) 175 °C MOSFET



FEATURES

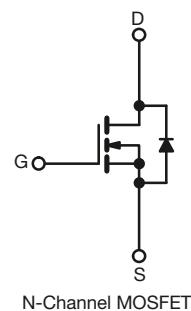
- ThunderFET® power MOSFET
- Low $R_{DS(on)}$ - Q_g figure-of-merit (FOM)
- Maximum 175 °C junction temperature
- 100 % R_g and UIS tested
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Synchronous rectification
- Power supplies
- DC/AC inverter
- DC/DC converter
- Solar micro inverter
- Motor drive switch



PRODUCT SUMMARY	
V_{DS} (V)	200
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 10$ V	0.0375
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 7.5$ V	0.0422
Q_g typ. (nC)	21
I_D (A)	35.1
Configuration	Single

ORDERING INFORMATION

Package	TO-263
Lead (Pb)-free and halogen-free	SUM90330E-GE3

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{DS}	200	V
Gate-source voltage	V_{GS}	± 20	
Continuous drain current	I_D	35.1	A
$T_C = 125$ °C		20.3	
Pulsed drain current ($t = 100$ μ s)	I_{DM}	70	
Continuous source-drain diode current	I_S	12.5	
Single pulse avalanche current ^a	I_{AS}	33	mJ
Single pulse avalanche energy ^a		54.45	
Maximum power dissipation	P_D	125 ^b	W
$T_C = 25$ °C		41.7 ^b	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) ^c		260	

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	MAXIMUM	UNIT
Maximum junction-to-ambient (PCB mount) ^c	R_{thJA}	40	°C/W
Maximum junction-to-case (drain)	Steady state	1.2	

Notes

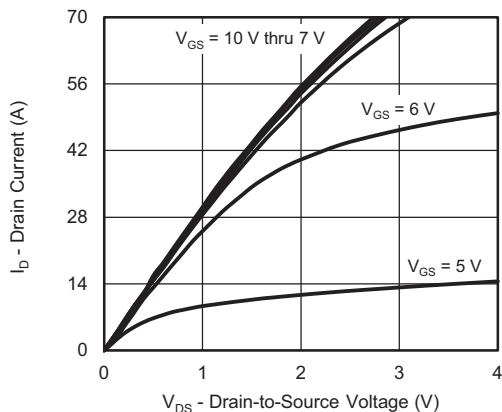
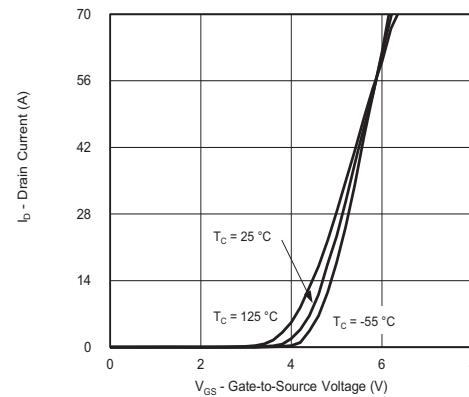
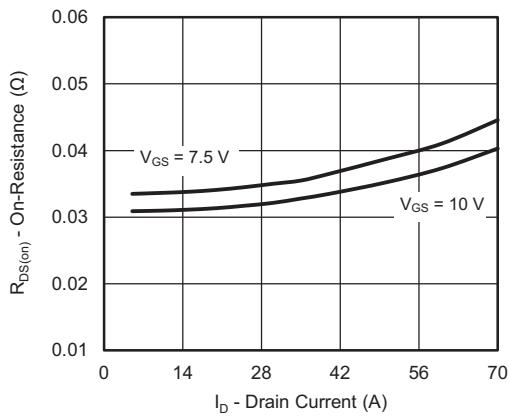
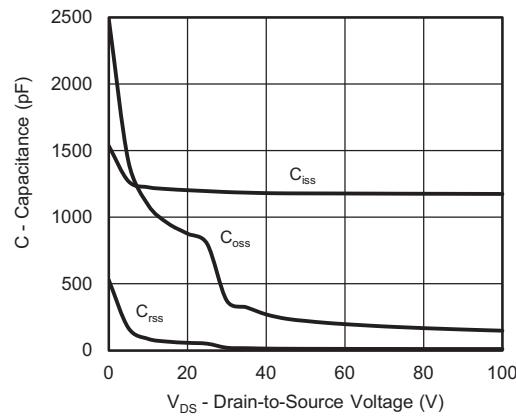
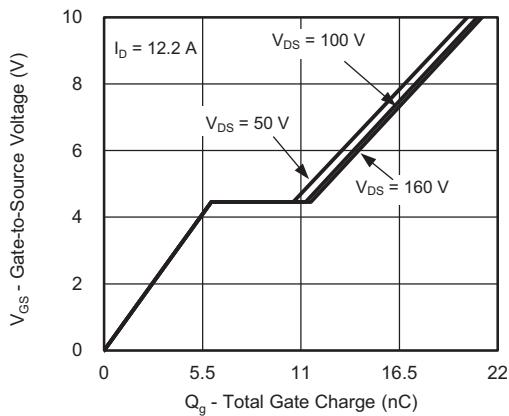
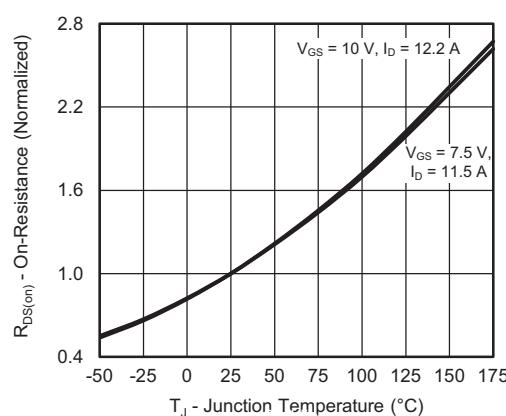
- Duty cycle ≤ 1 %
- See SOA curve for voltage derating
- When mounted on 1" square PCB (FR4 material)

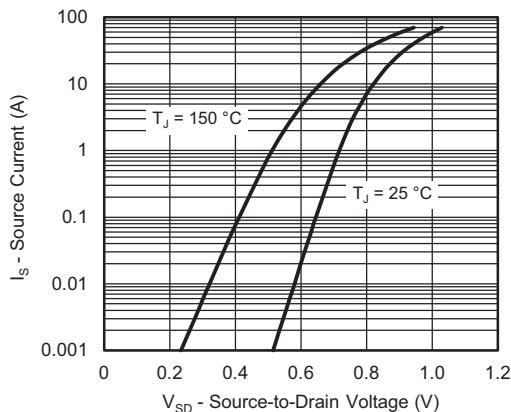
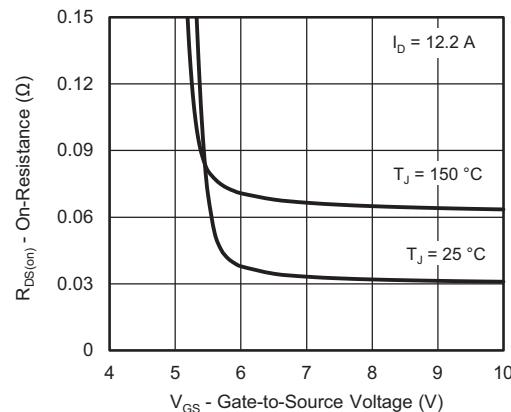
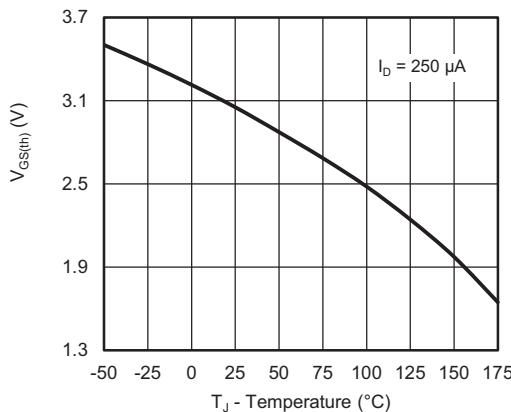
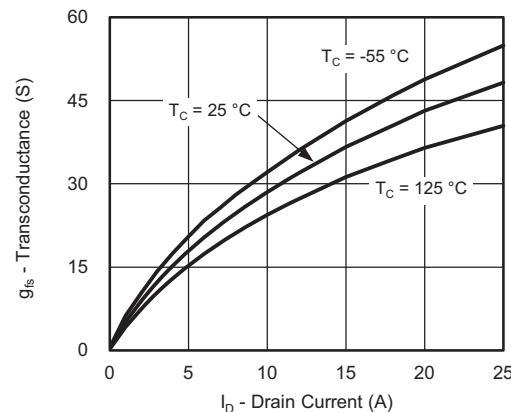
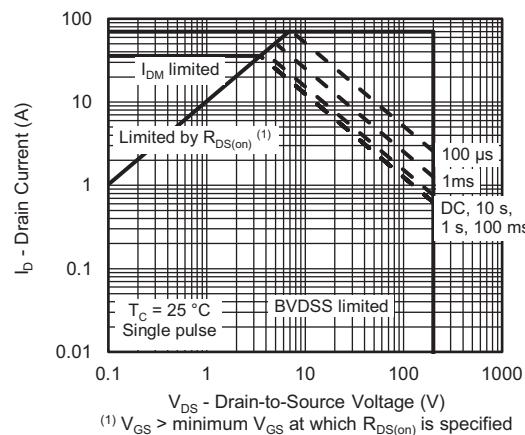
SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	200	-	-	V
Gate-source threshold voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	2	-	4	V
Gate-source leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$	-	-	250	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 200 \text{ V}, V_{GS} = 0 \text{ V}$	-	-	1	μA
		$V_{DS} = 200 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 125^\circ\text{C}$	-	-	150	μA
		$V_{DS} = 200 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 175^\circ\text{C}$	-	-	5	mA
On-state drain current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 10 \text{ V}, V_{GS} = 10 \text{ V}$	20	-	-	A
Drain-source on-state resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}, I_D = 12.2 \text{ A}$	-	0.0312	0.0375	Ω
		$V_{GS} = 7.5 \text{ V}, I_D = 11.5 \text{ A}$	-	0.0337	0.0422	Ω
Forward transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 10 \text{ A}$	-	28	-	S
Dynamic b						
Input capacitance	C_{iss}	$V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	-	1172	-	pF
Output capacitance	C_{oss}		-	150	-	
Reverse transfer capacitance	C_{rss}		-	11	-	
Total gate charge	Q_g	$V_{DS} = 100 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 12.2 \text{ A}$	-	21	32	nC
Gate-source charge	Q_{gs}		-	6	-	
Gate-drain charge	Q_{gd}		-	5.3	-	
Gate resistance	R_g	$f = 1 \text{ MHz}$	0.76	3.8	7.6	Ω
Turn-on delay time	$t_{d(\text{on})}$	$V_{DD} = 100 \text{ V}, R_L = 14.2 \Omega, I_D \approx 7 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$	-	12	24	ns
Rise time	t_r		-	25	50	
Turn-off delay time	$t_{d(\text{off})}$		-	30	50	
Fall time	t_f		-	22	44	
Drain-Source Body Diode Characteristics						
Pulse diode forward current ($t = 100 \mu\text{s}$)	I_{SM}	$I_F = 7 \text{ A}, V_{GS} = 0 \text{ V}$	-	-	70	A
Body diode voltage	V_{SD}		-	0.8	1.5	V
Body diode reverse recovery time	t_{rr}		-	111	170	ns
Body diode reverse recovery charge	Q_{rr}		-	0.51	1	μC
Reverse recovery fall time	t_a		-	94	-	ns
Reverse recovery rise time	t_b		-	17	-	
Body diode peak reverse recovery charge	$I_{RM(\text{REC})}$		-	8.5	17	A

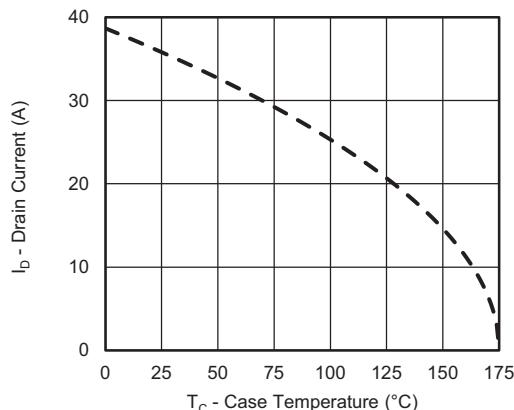
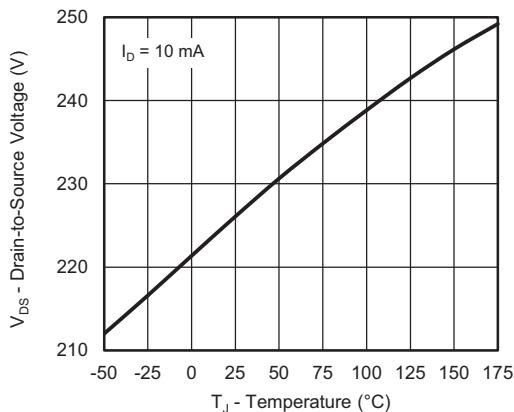
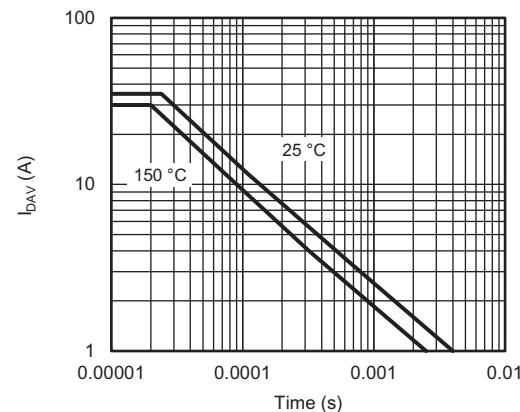
Notes

- 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

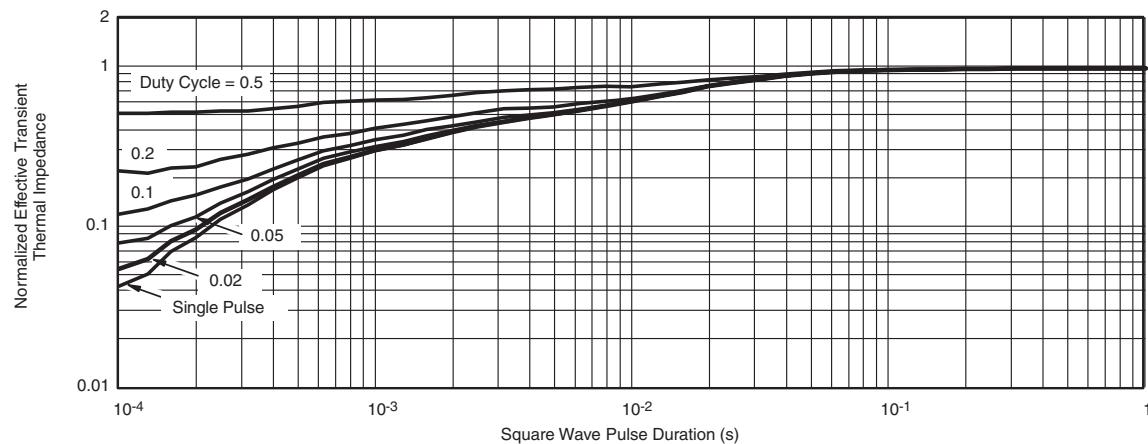
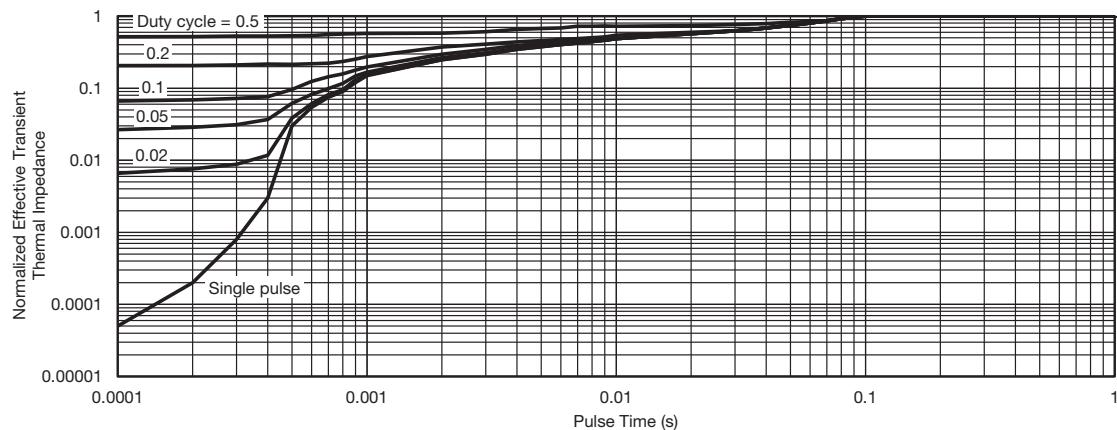
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current and Gate Voltage

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Source-Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage

Threshold Voltage

Transconductance

Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Current Derating ^a

Drain Source Breakdown vs. Junction Temperature

Avalanche vs. Time
Note

- a. The power dissipation P_D is based on T_J max. = 25 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Ambient

Normalized Thermal Transient Impedance, Junction-to-Case

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- Подбор аналогов;
- Консультации по применению компонента;
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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