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

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (mΩ)(Typ.)	I_D (A)(Max.)
100	8.2 at V_{GS} = 10 V	100[a]

FEATURES

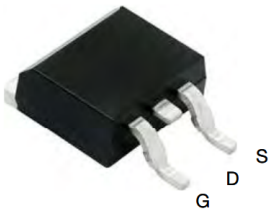
- DT-Trench II Power MOSFET
- 100 % Rg and UIS tested
- Fast switching

RoHS COMPLIANT

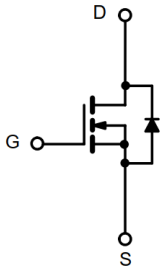
APPLICATIONS

- Load Switch
- LED applications
- Networking

TO-263 Pin Configuration



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_C = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 175 °C)	T_C = 25 °C	I_D	100[a]	A
	T_C = 100 °C		48[a]	
Pulsed Drain Current		I_{DM}	300	
Avalanche Current[b]		I_{AR}	55	
Repetitive Avalanche Energy[b]	L = 0.1 mH	E_{AR}	115	mJ
Maximum Power Dissipation[b]	T_C = 25 °C	P_D	138[c]	W
	T_A = 25 °C		2.05	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Limit**	**Unit**
Junction-to-Ambient	PCB Mount (TO-263)[d]	R_{thJA}	60	°C/W
Junction-to-Case (Drain)		R_{thJC}	1.5	

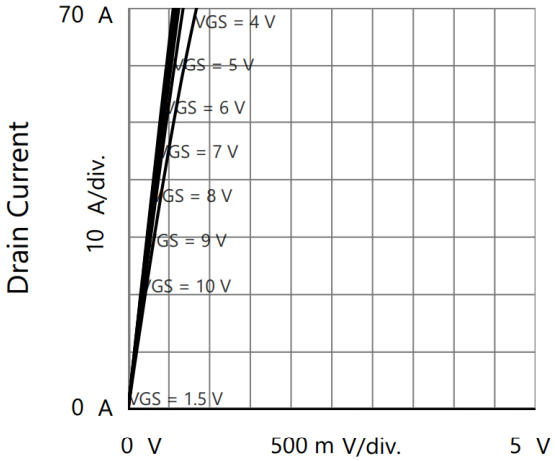
Notes:
a. Package limited.
b. Duty cycle ≤ 1 %.
c. See SOA curve for voltage derating.
d. When mounted on 1" square PCB (FR-4 material).

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{DS} = 0 V, I_D = 250 µA	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1		3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V			1	µA
		V_{DS} = 100 V, V_{GS} = 0 V, T_J = 85 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	100			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A		8.2	10	mΩ
		V_{GS} = 4.5 V, I_D = 20 A		9.5	13	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 20 A		65		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz		2158		pF
Output Capacitance	C_{oss}			897		
Reverse Transfer Capacitance	C_{rss}			22		
Total Gate Charge[c]	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 20 A		32		nC
Gate-Source Charge[c]	Q_{gs}			3.7		
Gate-Drain Charge[c]	Q_{gd}			1.2		
Gate Resistance	R_g			3.5		Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 50 V, R_L = 0.6 Ω I_D = 20 A, V_{GEN} = 10 V, R_g = 2.5 Ω		12		ns
Rise Time[c]	t_r			8		
Turn-Off Delay Time[c]	$t_{d(off)}$			25		
Fall Time[c]	t_f			5		
Source-Drain Diode Ratings and Characteristics T_C = 25 °C[b]						
Continuous Current	I_S				100	A
Pulsed Current	I_{SM}				300	
Forward Voltage[a]	V_{SD}	I_F = 1 A, V_{GS} = 0 V		0.6	1.0	V
Reverse Recovery Time	t_{rr}	I_F = 20 A, dI/dt = 100 A/µs		30		ns
Reverse Recovery Charge	Q_{rr}			190		nC

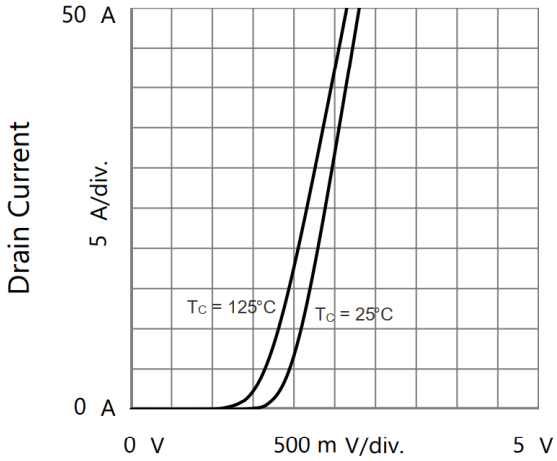
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

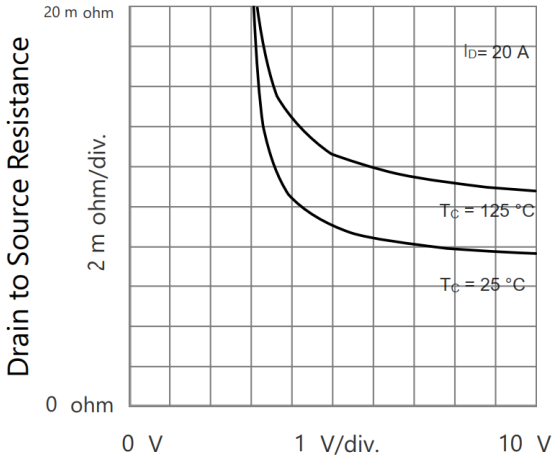
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



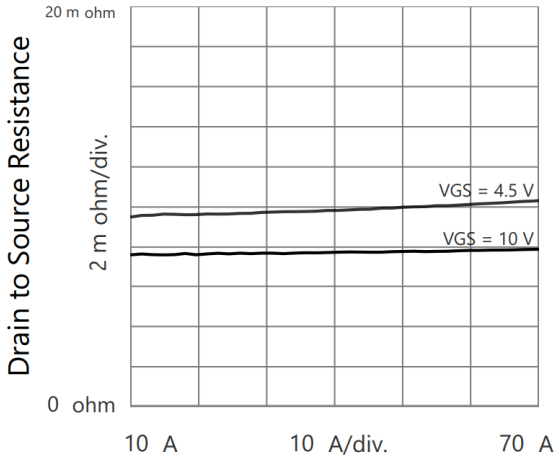
Output Characteristics



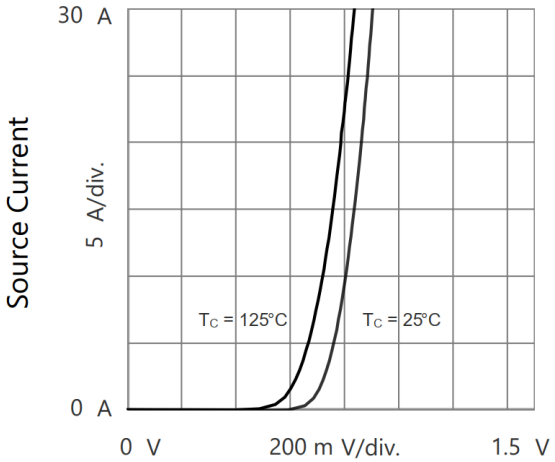
Transfer Characteristics



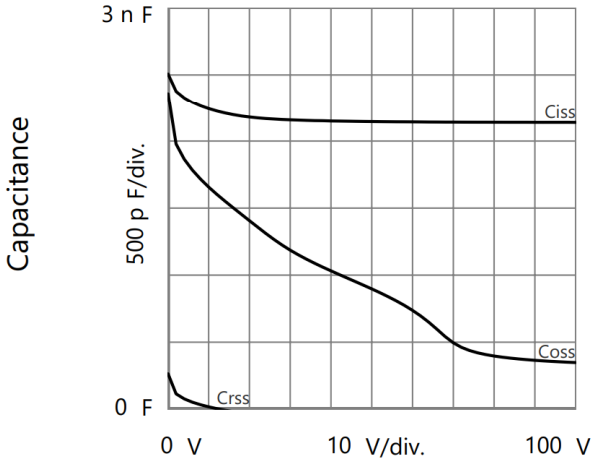
Drain to Source Resistance vs. Gate to Source Voltage



Drain to Source Resistance vs. Drain Current

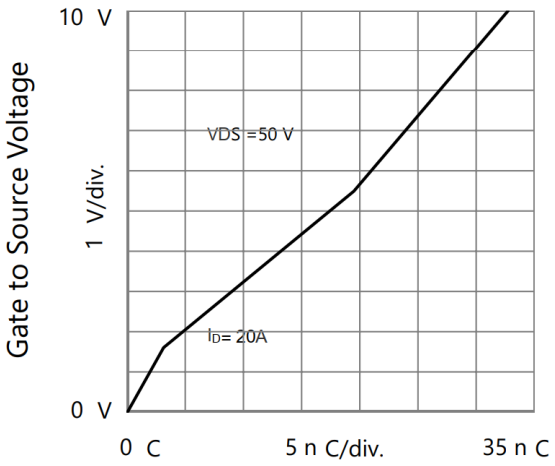


Body Diode Forward Characteristics

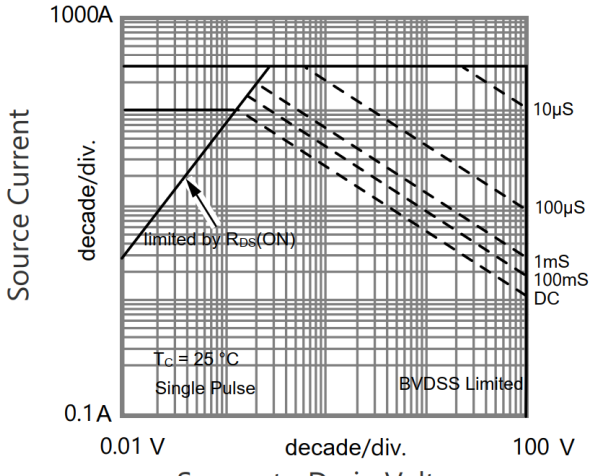


Capacitances

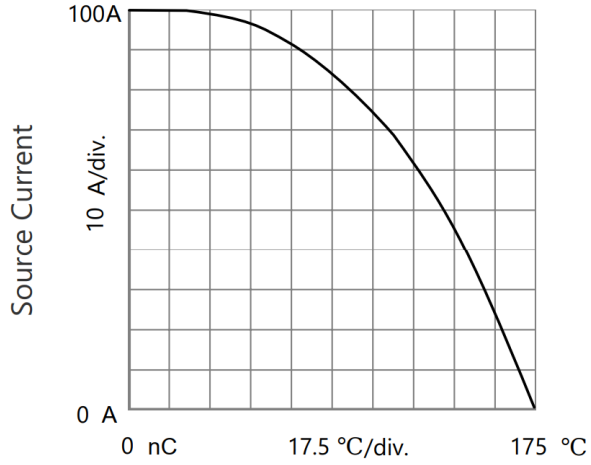
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



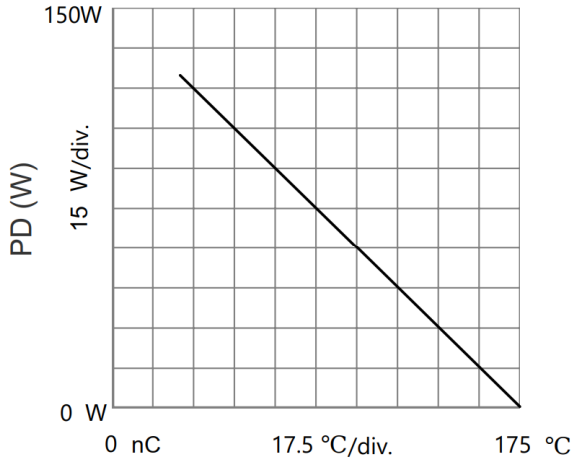
Gate to Source Voltage vs. GateCharge



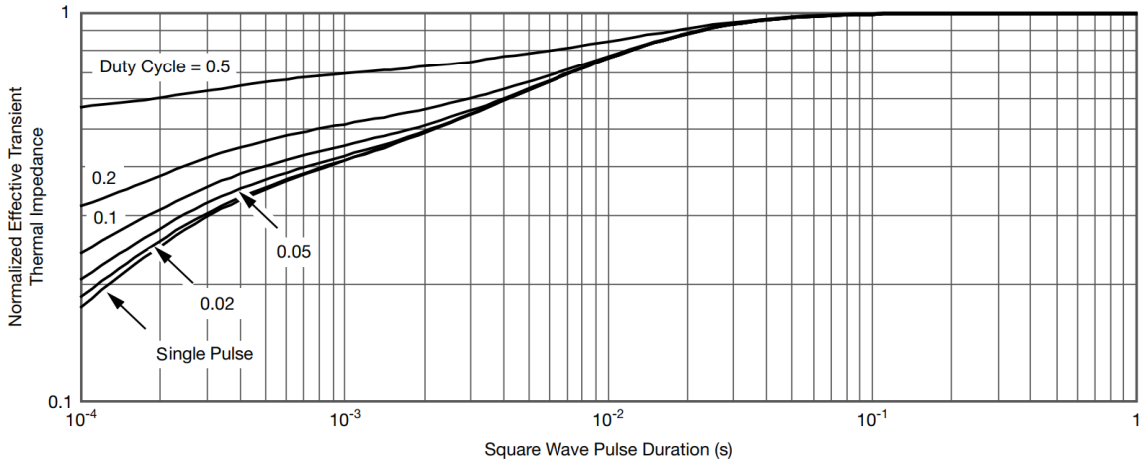
Safe Operating Area, Junction-to-Ambient



Current Derating

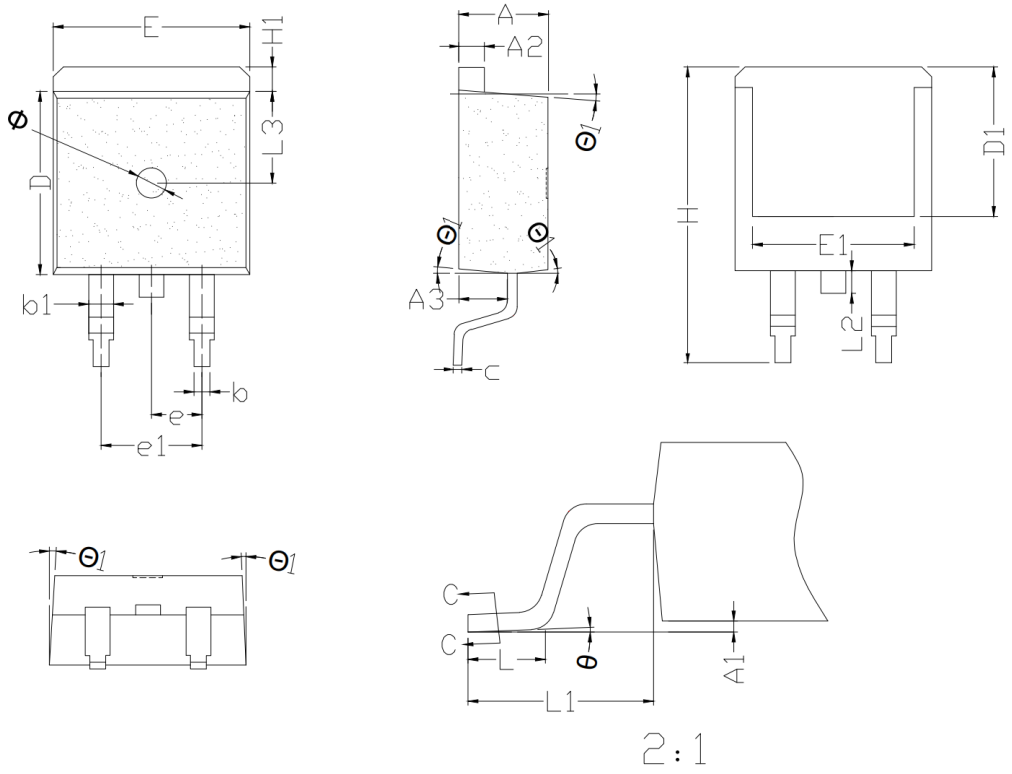


Power Derating



Normalized Thermal Transient Impedance, Junction-to-Case

TO-263 PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.10	4.50	4.80	e	2.35	2.54	2.75
A1	0.00	0.10	0.30	e1		5.08REF	
A2	1.10	1.30	1.50	H	14.50	15.15	16.00
A3	2.15	2.50	3.10	H1	1.00	1.28	1.75
b	0.60	0.80	1.05	L	1.80	2.23	2.90
b1	1.05	1.33	1.50	L1	4.30	4.75	5.50
c	0.33	0.50	0.66	L2	1.00	1.30	1.85
D	8.40	9.20	9.60	L3	0.90	4.65	9.00
D1		7.50REF		ϕ	0°	2°	5°
E	9.60	10.02	10.80	ϕ1	2°	-	7°
E1	7.60	9.88	10.30	Φ		1.5BSC	

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