

N-Channel 45 V (D-S) Power MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω) (TYP.)	I_D (A)	Q_g (TYP.)
45	1.1 at $V_{GS} = 10$ V	210	72 nC

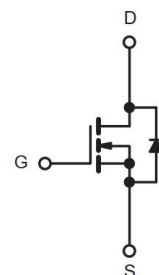
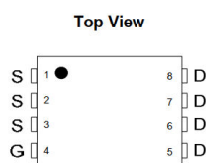
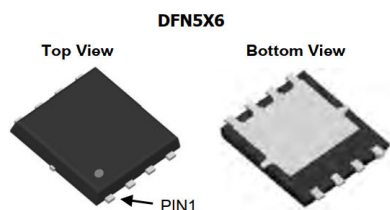
FEATURES

- DT-SGT Power MOSFET
- 100 % R_g and UIS Tested
- AEC-Q101 Qualified for Automotive Applications


RoHS
 COMPLIANT

APPLICATIONS

- Networking
- Load Switch



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	45	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	210
		$T_C = 70$ °C	185
Pulsed Drain Current	I_{DM}	800	A
Avalanche Current	I_{AS}	157	mJ
Single Avalanche Energy ^a			
Maximum Power Dissipation ^a	P_D	$T_C = 25$ °C	178 ^b
		$T_C = 70$ °C	113 ^b
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^c	R_{thJA}	20	°C/W
Junction-to-Case (Drain)	R_{thJC}	0.65	

Notes

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

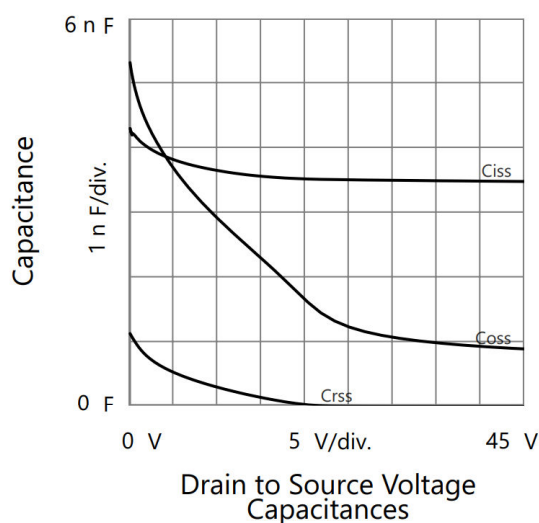
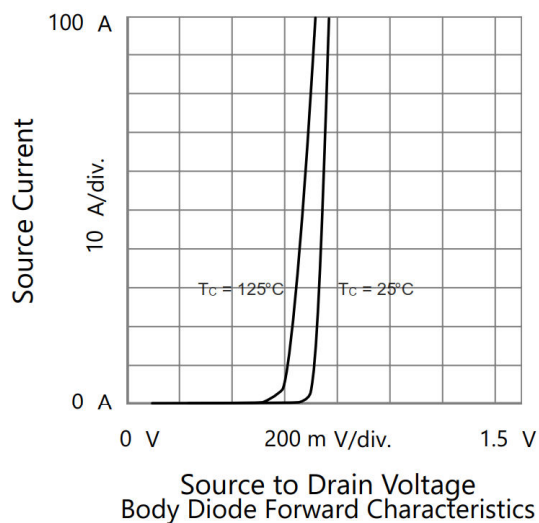
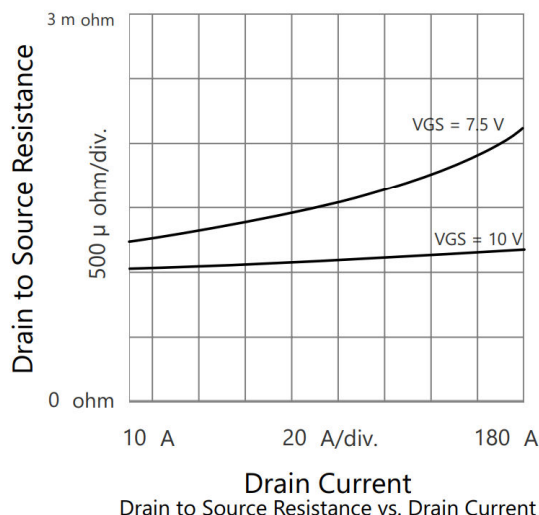
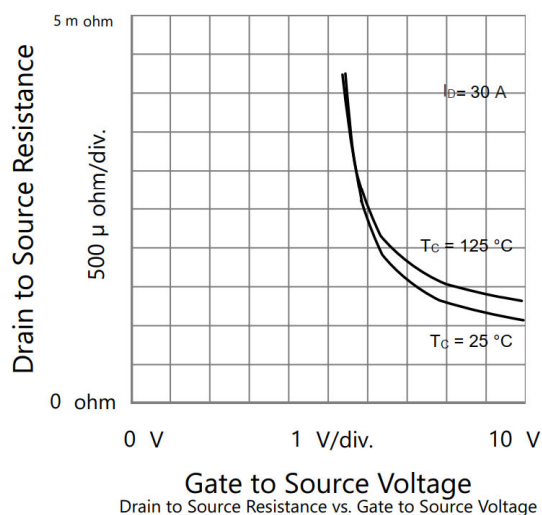
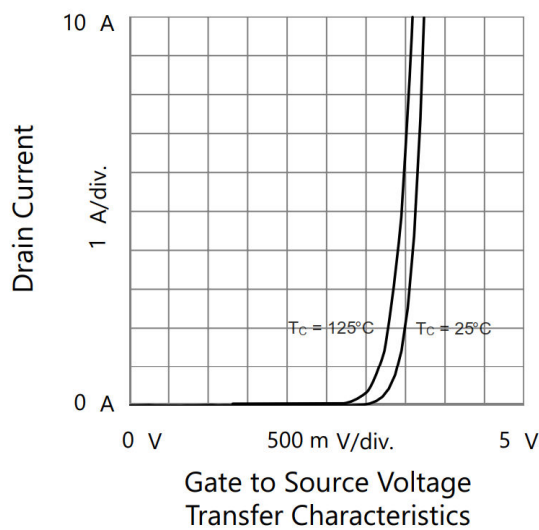
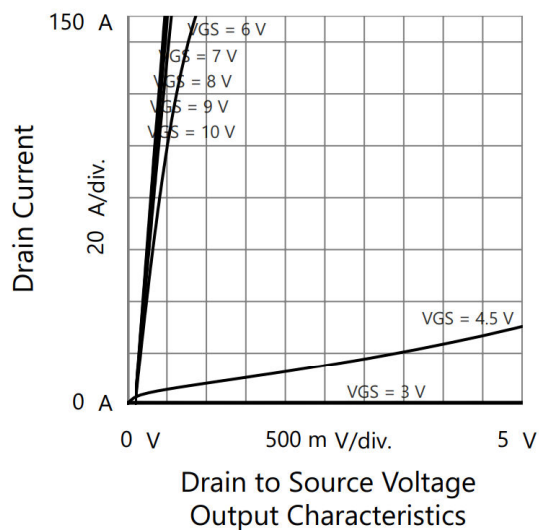
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	45	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2	-	4	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 45 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 36 V, V _{GS} = 0 V, T _J = 85 °C	-	-	10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	190	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 30 A	-	1.1	1.25	mΩ
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	-	85	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 20 V, f = 1 MHz	-	4080	-	pF
Output Capacitance	C _{oss}		-	985	-	
Reverse Transfer Capacitance	C _{rss}		-	17	-	
Total Gate Charge ^c	Q _g	V _{DS} = 20 V, V _{GS} = 10 V, I _D = 30 A	-	72	-	nC
Gate-Source Charge ^c	Q _{gs}		-	49	-	
Gate-Drain Charge ^c	Q _{gd}		-	16	-	
Gate Resistance	R _g	f = 1 MHz	-	1.0	-	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 20 V, R _L = 2 Ω I _D = 30 A, V _{GEN} = 10 V, R _g = 3 Ω	-	13	-	ns
Rise Time ^c	t _r		-	15	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	38	-	
Fall Time ^c	t _f		-	26	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C)						
Continuous Source Current	I _S	T _C = 25 °C	-	-	210	A
Pulsed Source Current	I _{SM}		-	-	800	A
Forward Voltage ^a	V _{SD}	I _F = 30 A, V _{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 100 A/μs	-	60	-	ns
Reverse Recovery Charge	Q _{rr}		-	136	-	μC

Notes

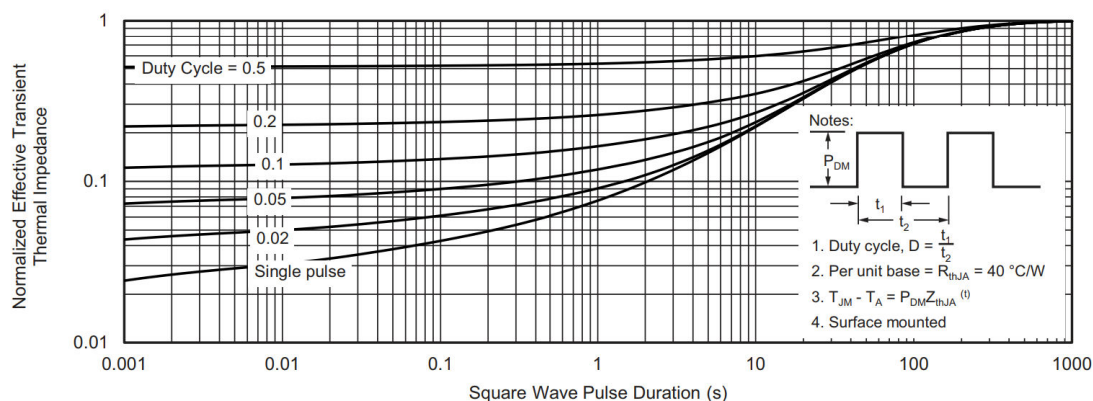
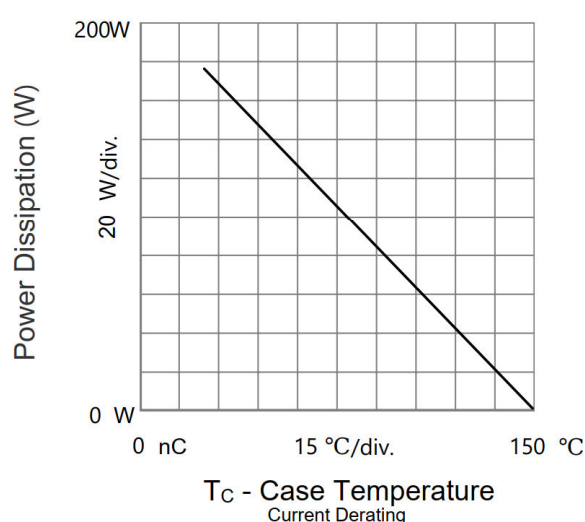
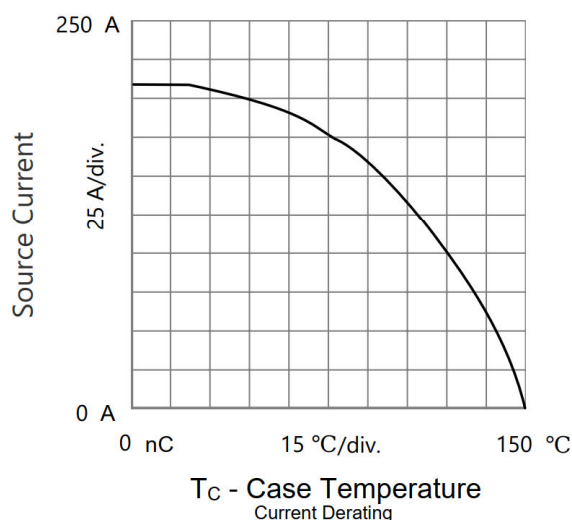
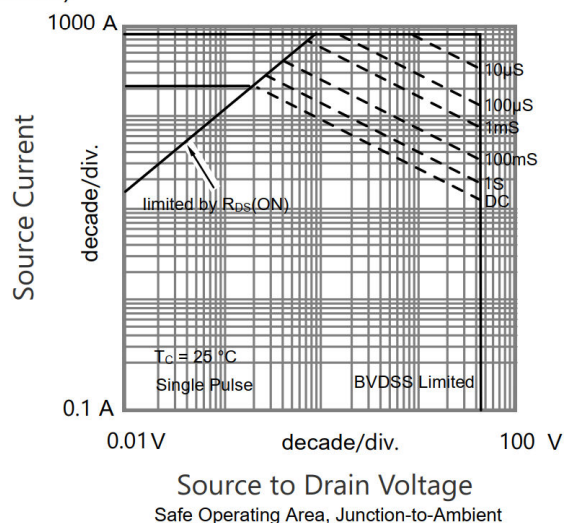
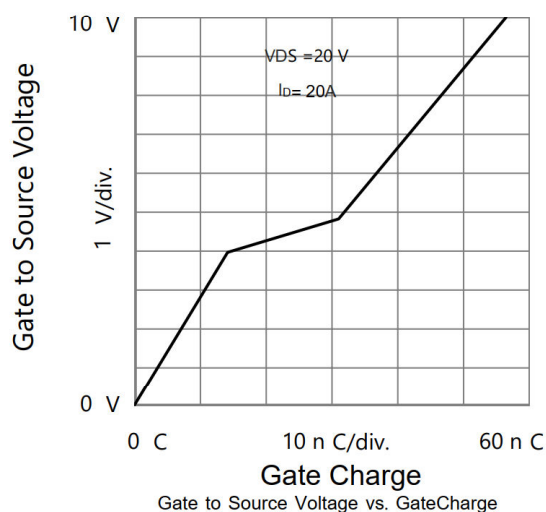
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

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)



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



Normalized Thermal Transient Impedance, Junction-to-Ambient

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