

N-Channel 150 V (D-S) Super Junction MOSFET

Features

- DT-SJ Power MOSFET
- Low Gate Charge
- 100 % Rg and UIS Tested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant



RoHS
COMPLIANT

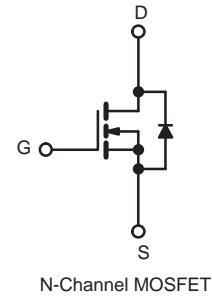
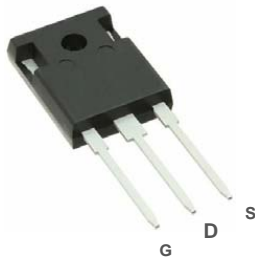
PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (mΩ)(Typ.)	I _D (A) ^a	Q _g (Typ.)
150	5.2 at V _{GS} = 10 V	157	43 nC

Applications

- Power Management in Telecom., Industrial Automation, CE
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Motor Driving in Power Tool, E-vehicle, Robotics

TO-247 Pin Configuration



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	150	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	157
		T _C = 100 °C	99
Pulsed Drain Current	I _{DM}	489	A
Single-Pulse Avalanche Energy	E _{AS}	540	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	347
		T _C = 100 °C	139
		T _A = 25 °C	2.6 ^{b,c}
		T _A = 100 °C	1.04 ^{b,c}
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^b	R _{thJA}	40	48	°C/W
Maximum Junction-to-Case	R _{thJC}	0.3	0.36	

Notes:

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.

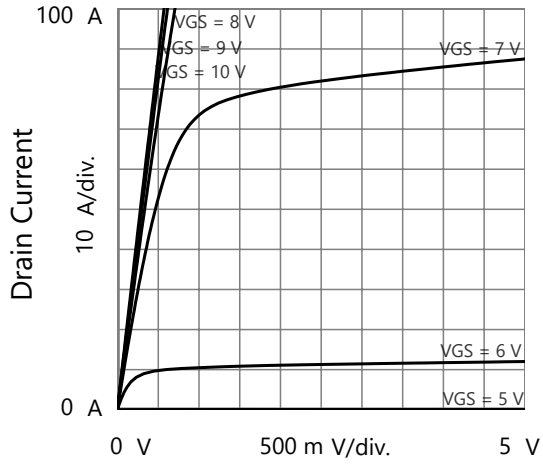
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$	150			V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.5		4.5	V
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}	$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	157			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		5.2	6.2	$\text{m}\Omega$
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 20\text{ A}$		64		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		3200		pF
Output Capacitance	C_{oss}			765		
Reverse Transfer Capacitance	C_{rss}			15		
Total Gate Charge	Q_g	$V_{DS} = 75\text{ V}, V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		43		nC
Gate-Source Charge	Q_{gs}			15.5		
Gate-Drain Charge	Q_{gd}			9		
Gate Resistance	R_g	$f = 1\text{ MHz}$		0.8		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 75\text{ V}, R_L = 3.75\Omega$ $I_D \cong 20\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\Omega$		19		ns
Rise Time	t_r			30		
Turn-Off Delay Time	$t_{d(off)}$			53		
Fall Time	t_f			41		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			157	A
Pulse Diode Forward Current (100 μs)	I_{SM}				489	
Body Diode Voltage	V_{SD}	$I_S = 1\text{ A}$			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 15\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		100		ns
Body Diode Reverse Recovery Charge	Q_{rr}				150	

Notes:

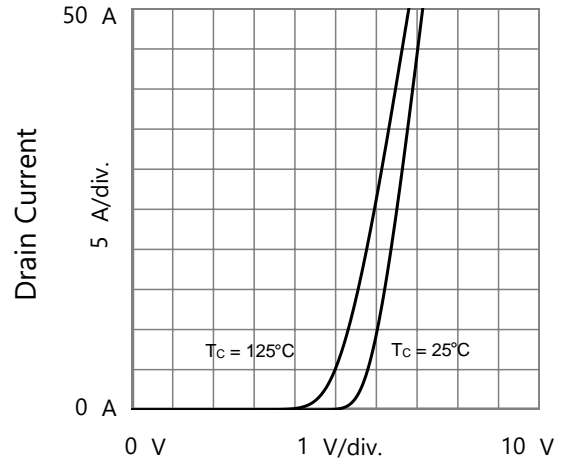
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

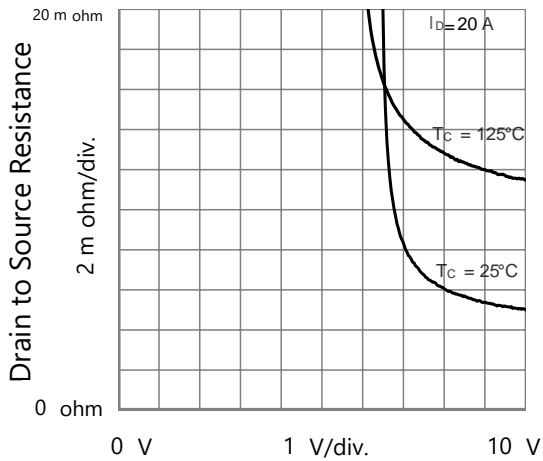
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



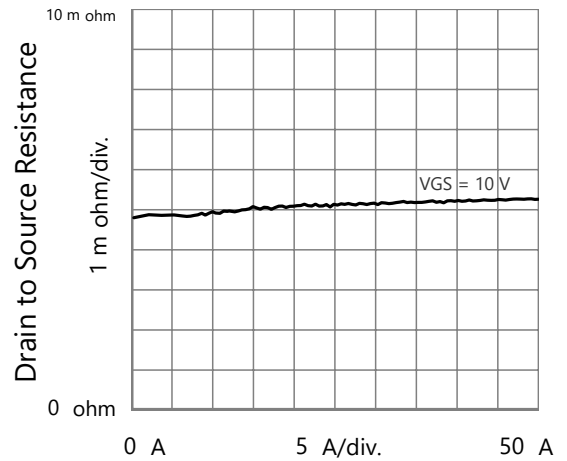
Drain to Source Voltage Output Characteristics



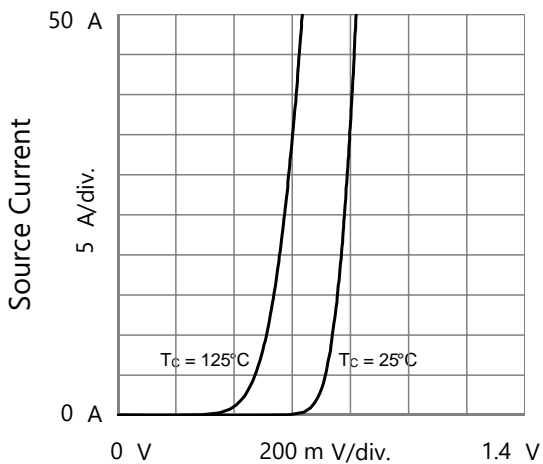
Gate to Source Voltage Transfer Characteristics



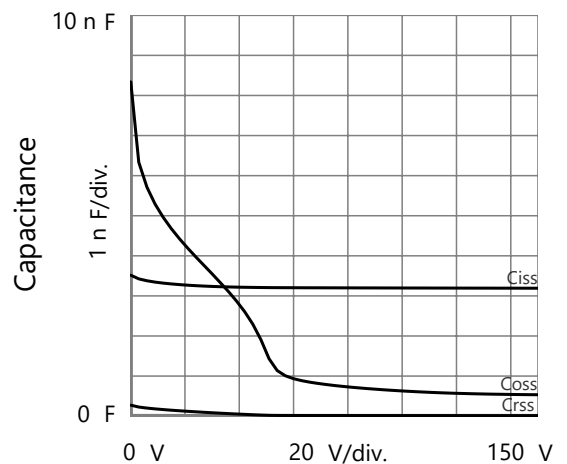
Gate to Source Voltage Drain to Source Resistance vs. Gate to Source Voltage



Drain Current Drain to Source Resistance vs. Drain Current

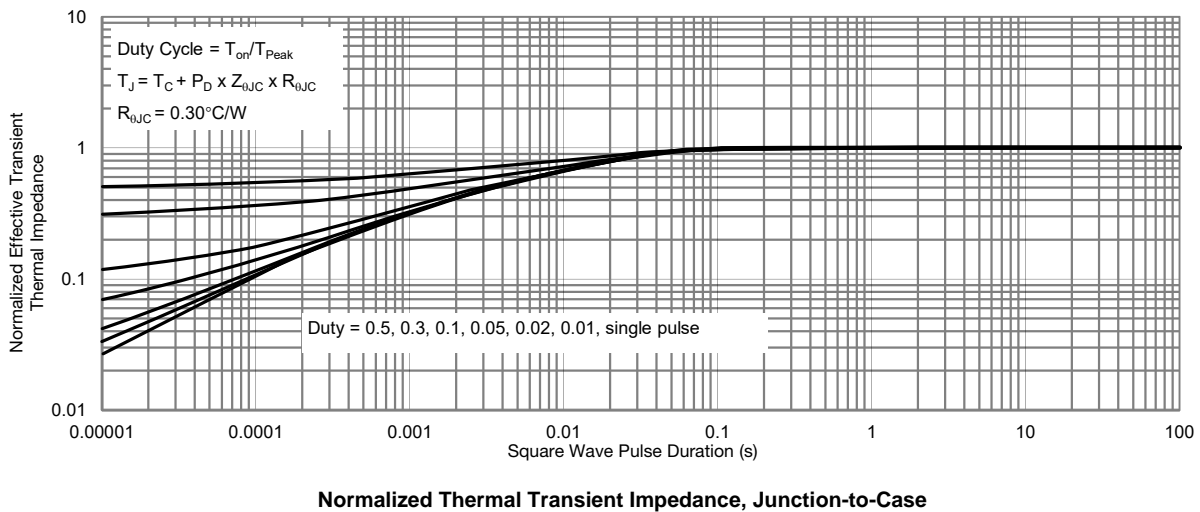
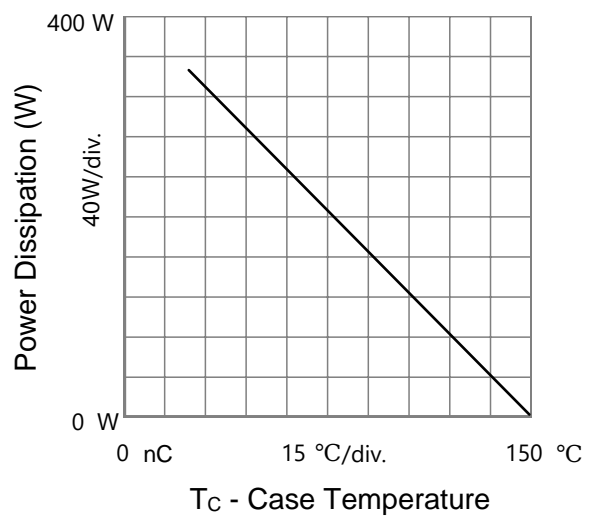
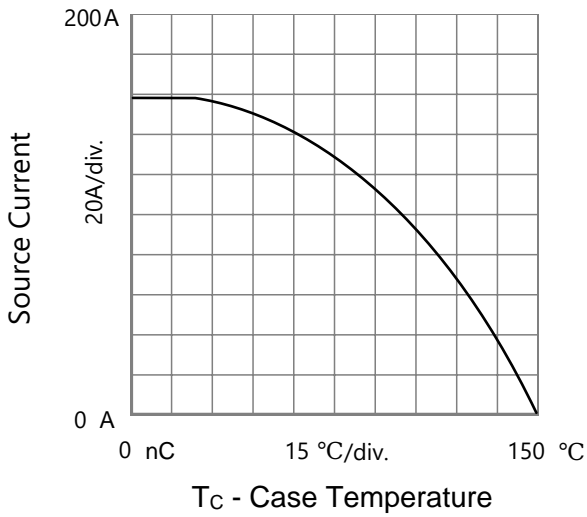
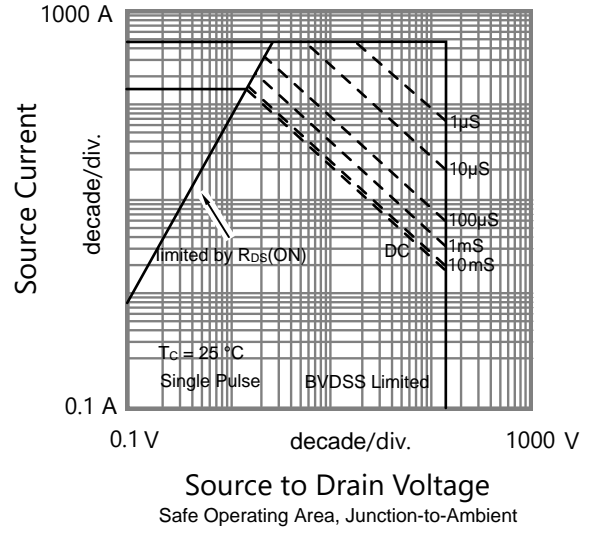
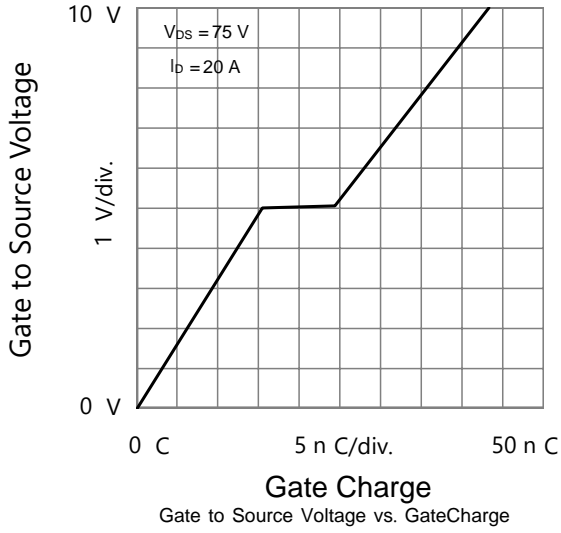


Source to Drain Voltage Body Diode Forward Characteristics



Drain to Source Voltage Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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