

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

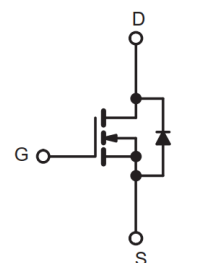
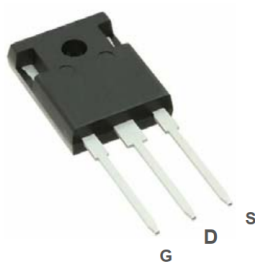
PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)(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



N-Channel MOSFET

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	V
Continuous Drain Current ($T_J = 150$ °C)	I_D	157	A
		99	
Pulsed Drain Current	I_{DM}	489	A
Single-Pulse Avalanche Energy	E_{AS}	540	mJ
Maximum Power Dissipation	P_D	347	W
		139	
		2.6 ^{b,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:

a. Based on $T_C = 25$ °C.

b. Surface mounted on 1" x 1" FR4 board.

c. $t = 10$ s.

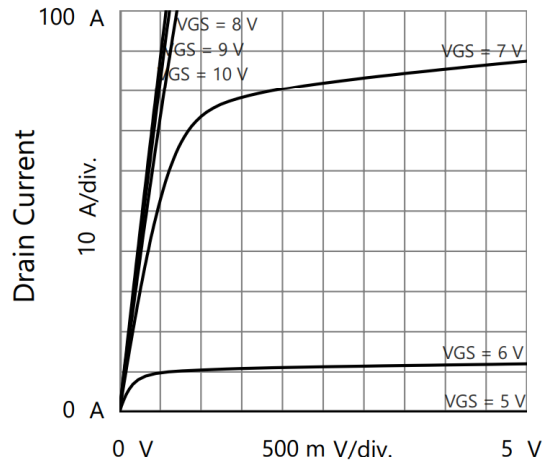
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA	150			V
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.5		4.5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 120V, V _{GS} = 0 V			1	μA
		V _{DS} = 120V, V _{GS} = 0 V, T _J = 55 °C			5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	157			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		5.2	6.2	mΩ
Forward Transconductance ^a	g _{fs}	V _{DS} = 5 V, I _D = 20 A		64		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = 75 V, V _{GS} = 0 V, f = 1 MHz		3200		pF
Output Capacitance	C _{oss}			765		
Reverse Transfer Capacitance	C _{rss}			15		
Total Gate Charge	Q _g	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 20 A		43		nC
Gate-Source Charge	Q _{gs}			15.5		
Gate-Drain Charge	Q _{gd}			9		
Gate Resistance	R _g	f = 1 MHz		0.8		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 75 V, R _L = 3.75Ω I _D ≅ 20 A, V _{GEN} = 10 V, R _g = 6 Ω		19		ns
Rise Time	t _r			30		
Turn-Off DelayTime	t _{d(off)}			53		
Fall Time	t _f			41		
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I _S	T _C = 25 °C			157	A
Pulse Diode Forward Current (100 μs)	I _{SM}				489	
Body Diode Voltage	V _{SD}	I _S = 1 A			1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 15 A, dI/dt = 100 A/μs, T _J = 25 °C		100		ns
Body Diode Reverse Recovery Charge	Q _{rr}			150		nC

Notes:

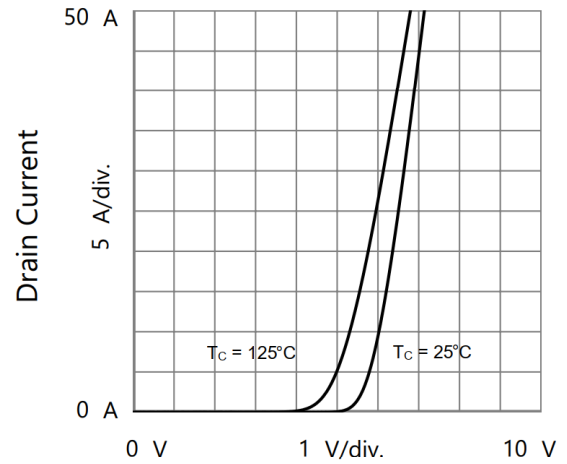
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

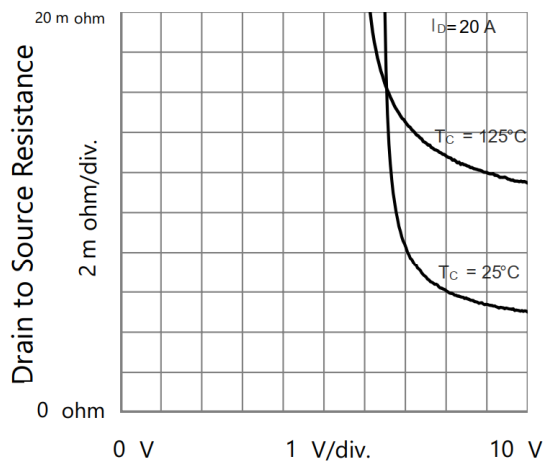
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



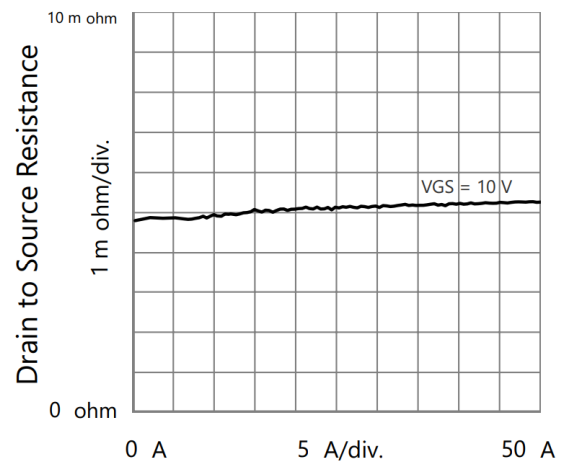
Drain to Source Voltage
Output Characteristics



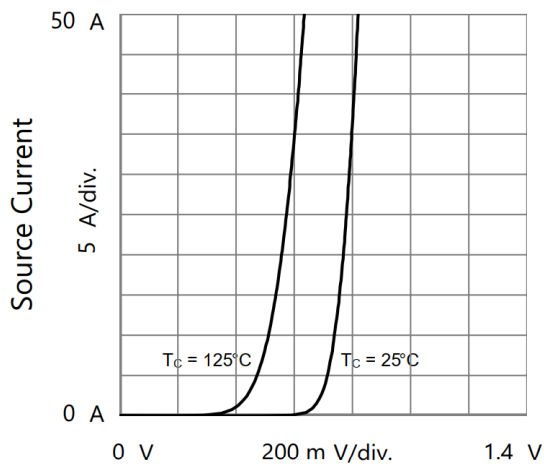
Gate to Source Voltage
Transfer Characteristics



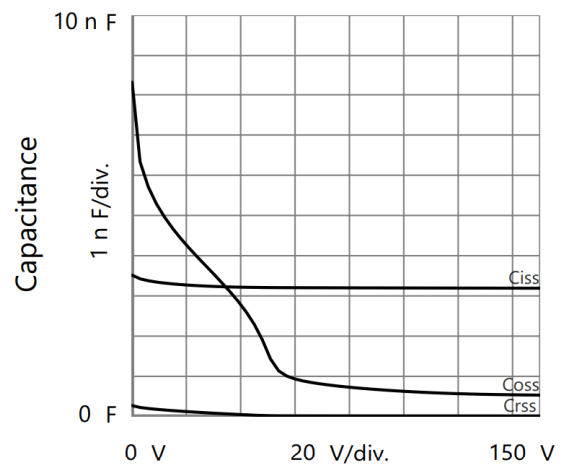
Gate to Source Voltage
Drain to Source Resistance vs. Gate to Source Voltage



Drain Current
Drain to Source Resistance vs. Drain Current

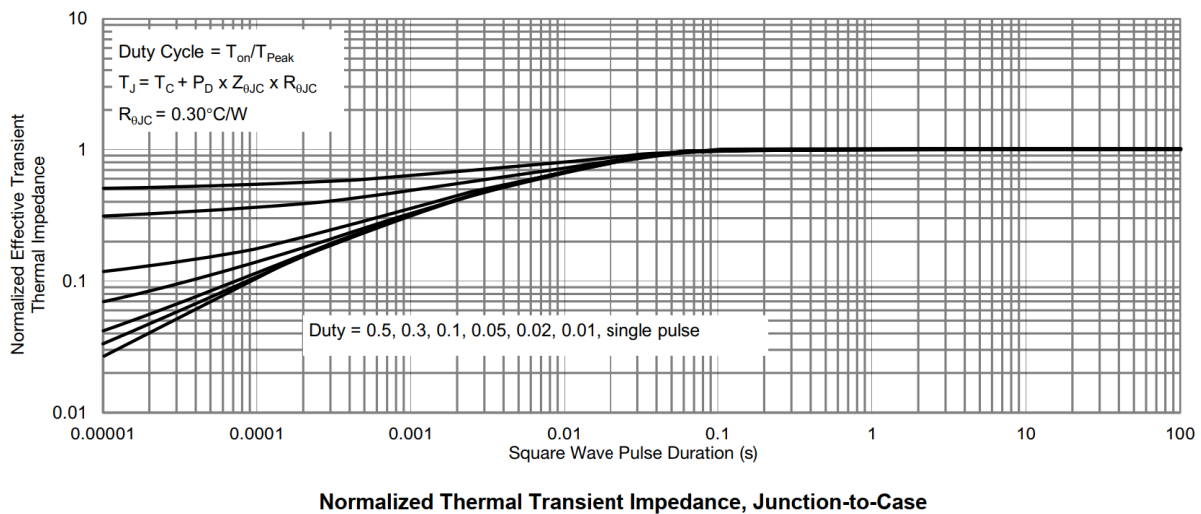
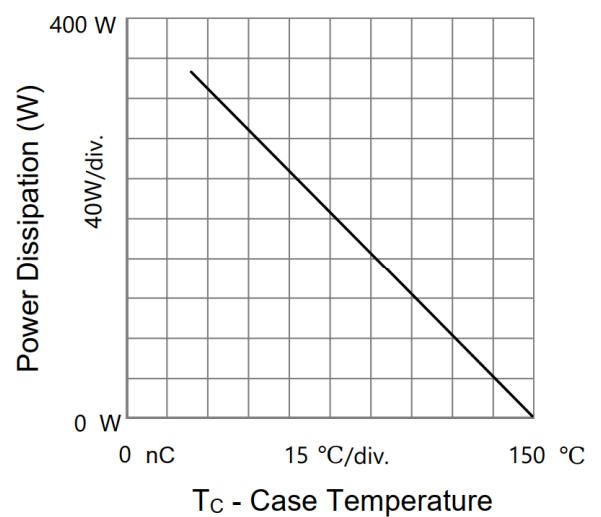
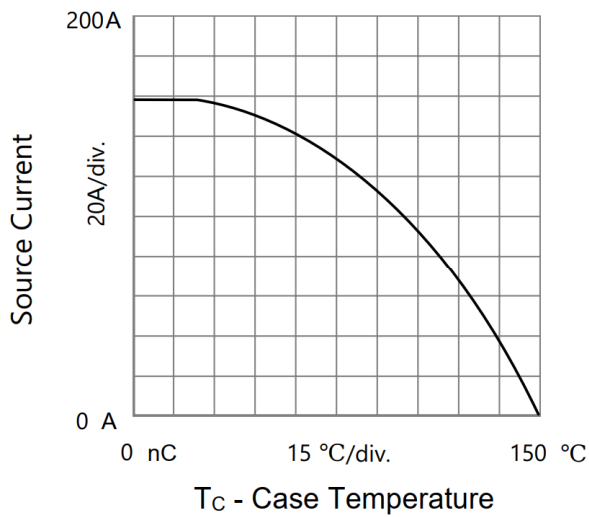
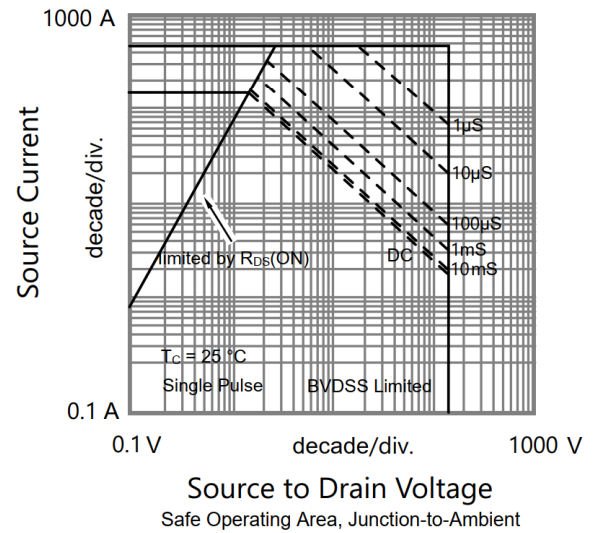
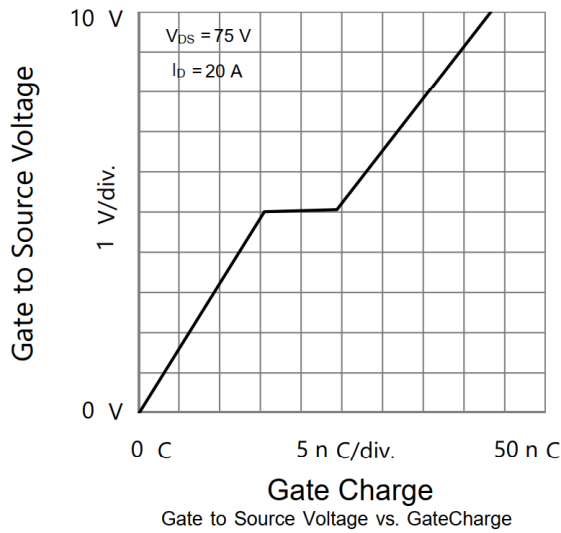


Source to Drain Voltage
Body Diode Forward Characteristics

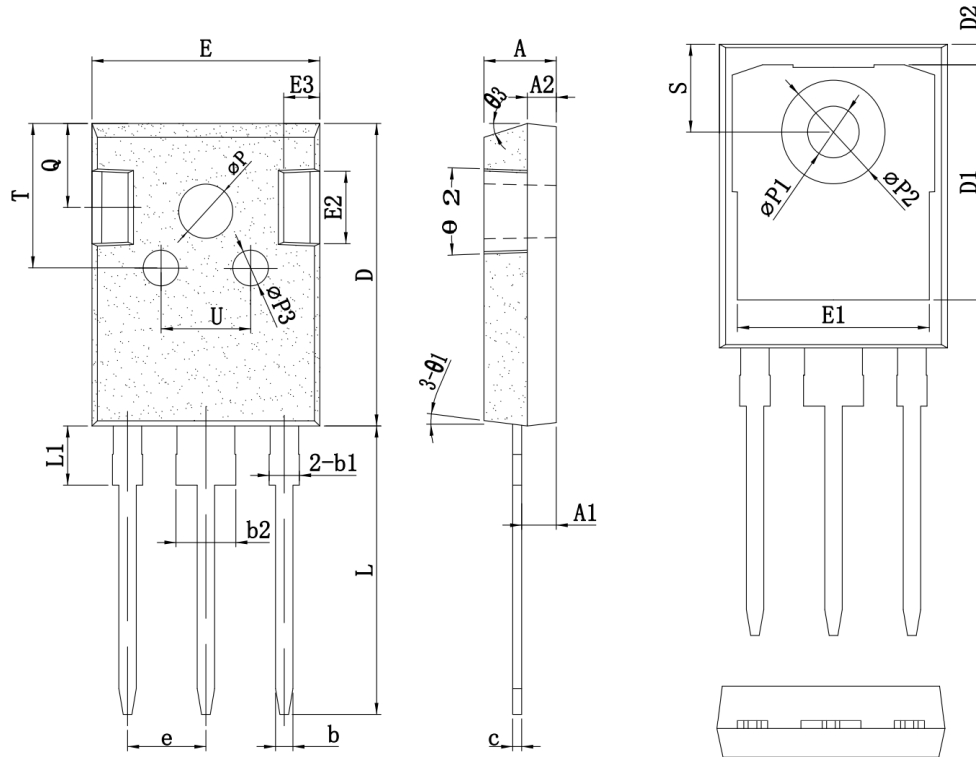


Drain to Source Voltage
Capacitances

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



TO-247_3L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	TYP	MAX	SYMBOL	MIN	TYP	MAX
A	4.60	5.00	5.40	e	2.10	5.44	5.70
A1	2.10	2.41	2.70	L	19.00	19.98	21.00
A2	1.70	2.00	2.30	L1	-	-	4.50
b	1.00	1.20	1.40	ΦP	3.30	3.70	4.00
b1	1.80	2.10	2.40	$\Phi P1$	3.25	3.55	3.85
b2	2.80	3.10	3.40	$\Phi P2$	6.80	7.18	7.60
C	0.45	0.60	0.75	$\Phi P3$	2.30	2.50	3.30
D	19.00	21.00	23.00	Q	5.50	5.80	6.30
D1	16.00	16.55	17.00	S	5.60	6.15	6.30
D2	0.95	1.20	1.45	T	9.50	10.00	10.50
E	15.70	15.80	16.50	U	6.00	-	8.00
E1	12.80	13.25	13.70	$\theta1$	5°	7°	9°
E2	4.20	5.00	5.30	$\theta2$	1°	3°	5°
E3	2.20	2.50	2.80	$\theta3$	13°	15°	17°

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