

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

Key Features:

- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

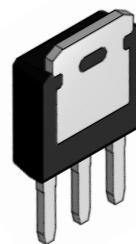
Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

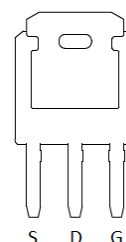
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
100	36 @ $V_{GS} = 10V$	31
	42 @ $V_{GS} = 4.5V$	29



RoHS
COMPLIANT
HALOGEN
FREE



TO-251



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^a	I_D	31.0	A
Pulsed Drain Current ^b			
Continuous Source Current (Diode Conduction) ^a	I_S	40	A
Power Dissipation ^a	P_D	50	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient ^c	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Case	$R_{\theta JC}$	3	

Notes

- Package Limited
- Pulse width limited by maximum junction temperature
- Surface Mounted on 1" x 1" FR4 Board.

Electrical Characteristics

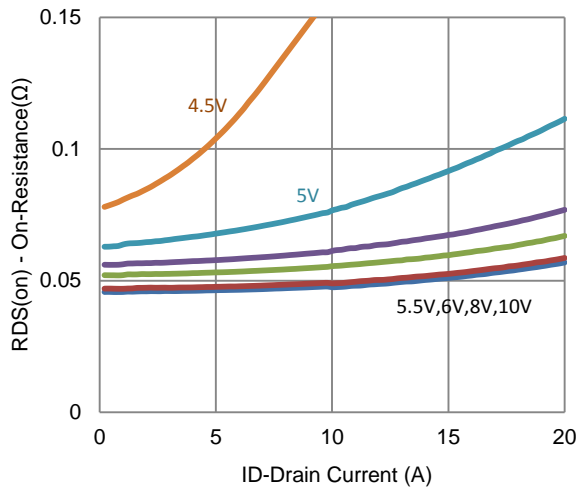
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80 V, V_{GS} = 0 V$			1	uA
		$V_{DS} = 80 V, V_{GS} = 0 V, T_J = 55^\circ C$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 V, V_{GS} = 10 V$	45			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 V, I_D = 20 A$			36	mΩ
		$V_{GS} = 4.5 V, I_D = 16 A$			42	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 V, I_D = 20 A$		21		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 20 A, V_{GS} = 0 V$		0.9		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 50 V, V_{GS} = 4.5 V,$ $I_D = 20 A$		19		nC
Gate-Source Charge	Q_{gs}			4.2		
Gate-Drain Charge	Q_{gd}			10		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 50 V, R_L = 2.5 \Omega,$ $I_D = 20 A,$ $V_{GEN} = 10 V, R_{GEN} = 6 \Omega$		13		ns
Rise Time	t_r			16		
Turn-Off Delay Time	$t_{d(off)}$			46		
Fall Time	t_f			17		
Input Capacitance	C_{iss}	$V_{DS} = 15 V, V_{GS} = 0 V, f = 1 \text{ Mhz}$		1194		pF
Output Capacitance	C_{oss}			140		
Reverse Transfer Capacitance	C_{rss}			129		

Notes

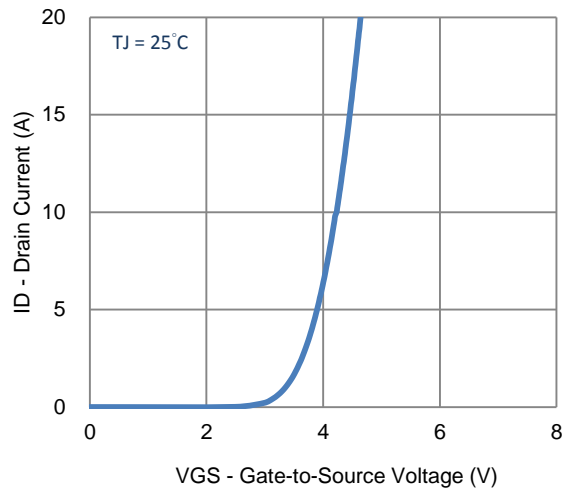
- Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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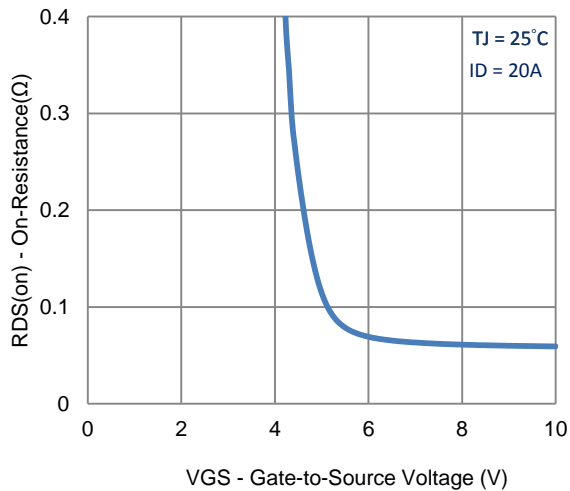
Typical Electrical Characteristics



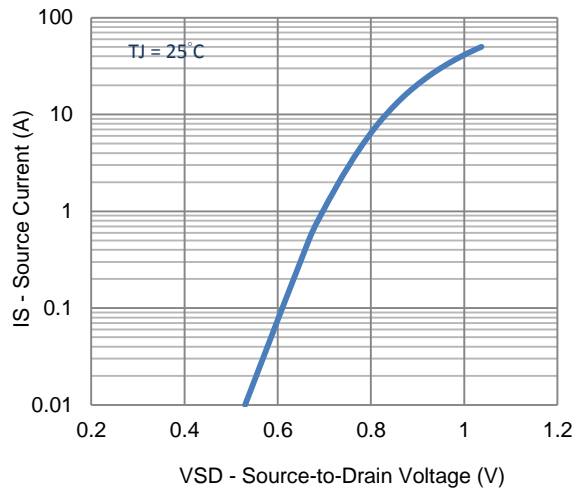
1. On-Resistance vs. Drain Current



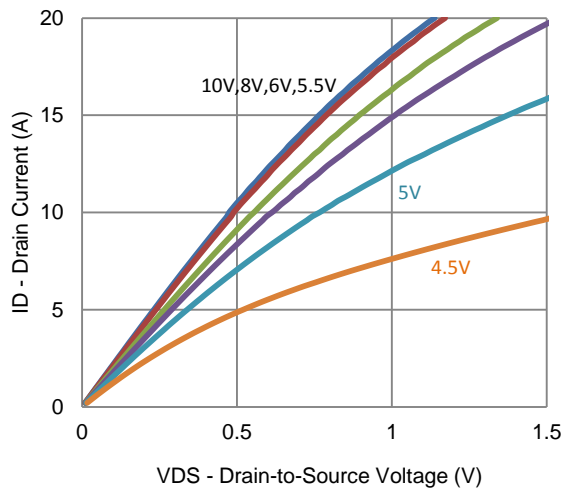
2. Transfer Characteristics



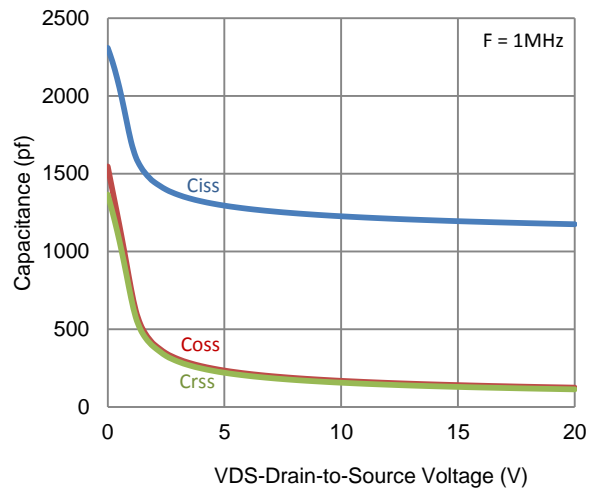
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

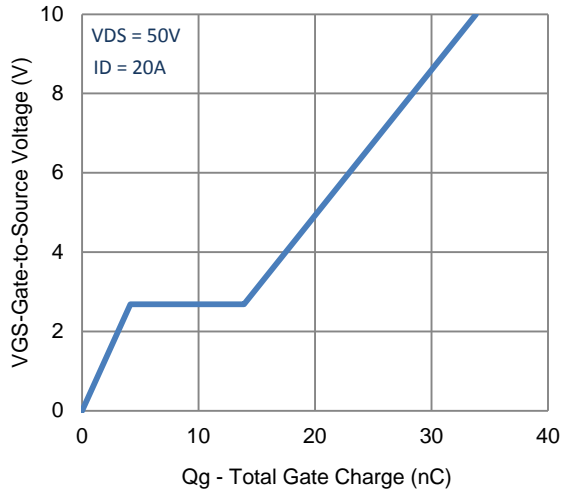


5. Output Characteristics

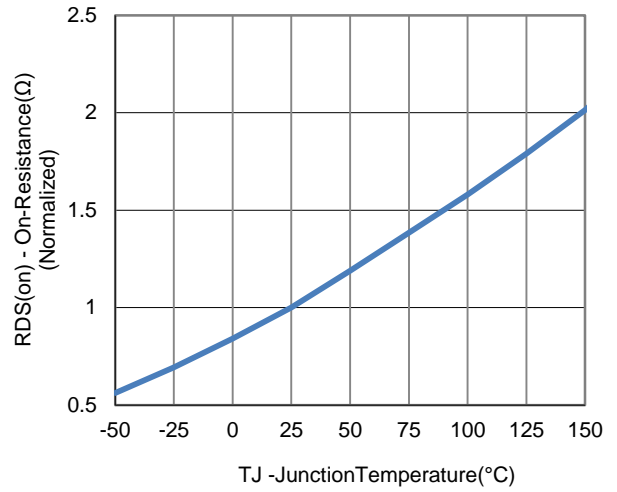


6. Capacitance

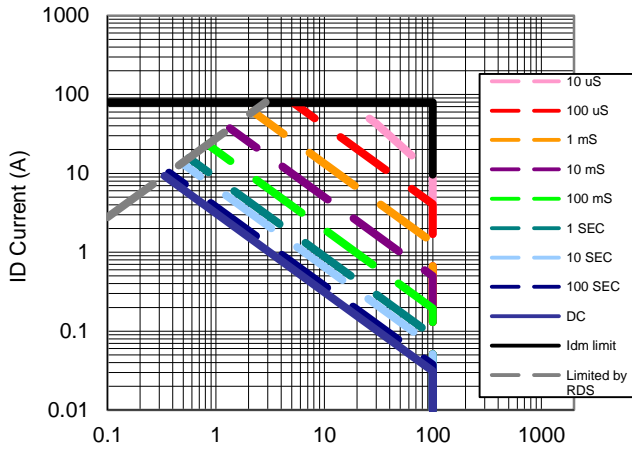
Typical Electrical Characteristics



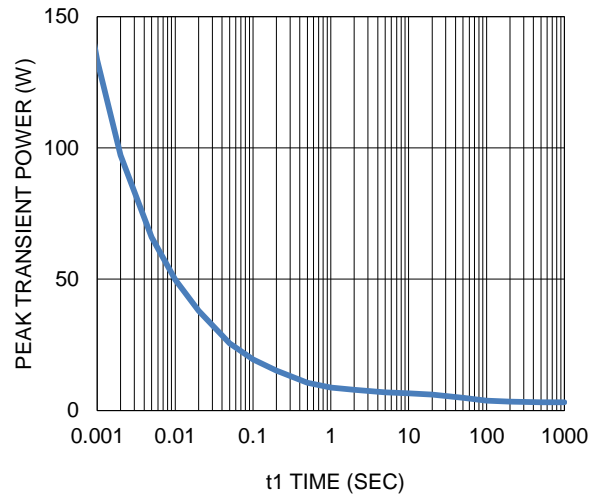
7. Gate Charge



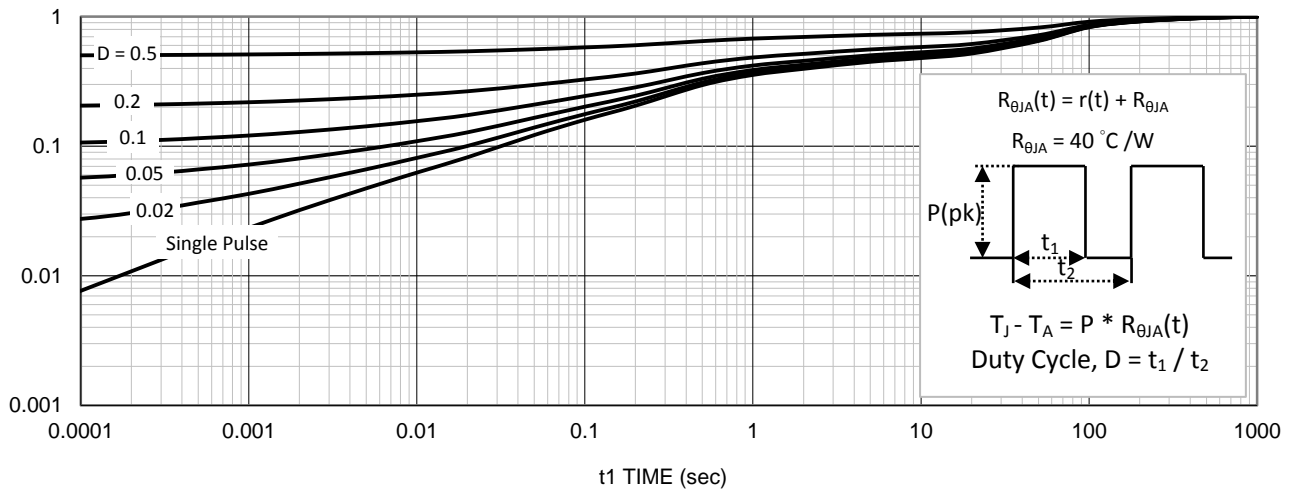
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

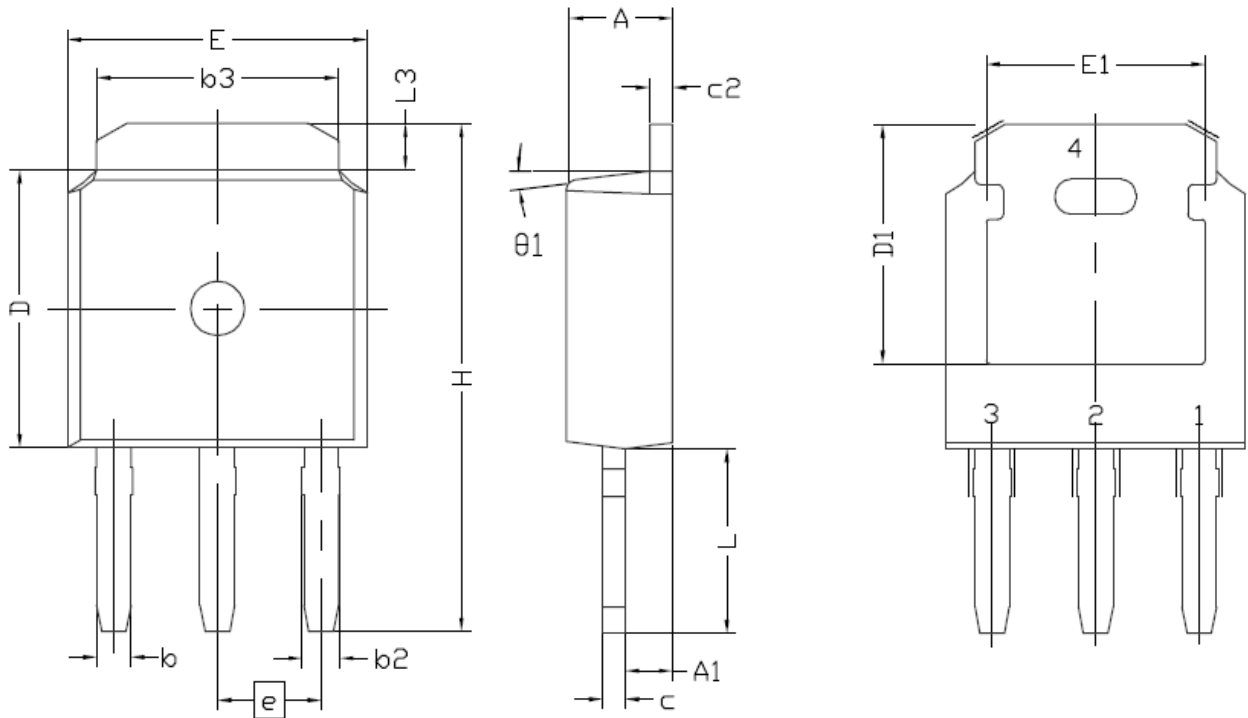


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	NOM	MAX
E	6.35	6.60	6.73	0.250	0.260	0.265
L	3.70	4.05	4.40	0.146	0.159	0.173
L3	0.89	1.016	1.27	0.035	0.040	0.050
D	6.00	6.10	6.20	0.236	0.240	0.244
H	10.80	11.15	11.50	0.425	0.439	0.453
b	0.635	0.76	0.889	0.025	0.030	0.035
b2	0.762	0.84	1.143	0.030	0.033	0.045
b3	5.21	5.34	5.46	0.205	0.210	0.215
e	2.286 BSC			0.090 BSC		
A	2.20	2.30	2.38	0.087	0.091	0.094
A1	0.94	1.04	1.14	0.037	0.041	0.045
c	0.457	0.50	0.60	0.018	0.020	0.024
c2	0.457	0.50	0.60	0.018	0.020	0.024
D1	5.21	--	--	0.205	--	--
E1	4.318	--	--	0.170	--	--
$\theta1$	0°	7°	15°	0°	7°	15°