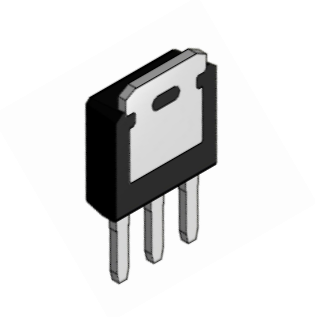
N-Channel 100-V (D-S) MOSFET

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

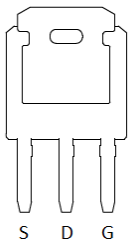
Typical Applications:
- LED Inverter Circuits
- DC/DC Conversion Circuits
- Motor drives

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D (A)
100	7 @ V_{GS} = 10V	60[a]
	9 @ V_{GS} = 4.5V	

Pb-free
RoHS COMPLIANT
HALOGEN FREE



TO-251



ABSOLUTE MAXIMUM RATINGS (T_A = 25°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]	T_C=25°C	I_D	60	A
Pulsed Drain Current [b]		I_{DM}	240	
Continuous Source Current (Diode Conduction) [a]	T_C=25°C	I_S	60	A
Power Dissipation [a]	T_C=25°C	P_D	50	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	**Symbol**	**Maximum**	**Units**
Maximum Junction-to-Ambient [c]	$R_{\theta JA}$	40	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	3	

Notes
a. Package Limited
b. Pulse width limited by maximum junction temperature
c. Surface Mounted on 1” x 1” FR4 Board.

Electrical Characteristics

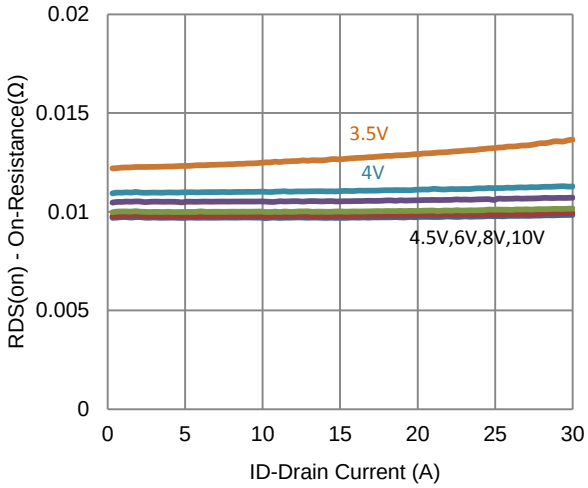
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80 V, V_{GS} = 0 V			1	uA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 55°C			10	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	120			A
Drain-Source On-Resistance [a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A			7	mΩ
		V_{GS} = 4.5 V, I_D = 16 A			9	
Forward Transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 20 A		11		S
Diode Forward Voltage [a]	V_{SD}	I_S = 30 A, V_{GS} = 0 V		0.83		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS} = 50 V, V_{GS} = 4.5 V, I_D = 20 A		51		nC
Gate-Source Charge	Q_{gs}			22		
Gate-Drain Charge	Q_{gd}			15		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 50 V, R_L = 2.5 Ω, I_D = 20 A, V_{GEN} = 10 V, R_{GEN} = 6 Ω		20		ns
Rise Time	t_r			16		
Turn-Off Delay Time	$t_{d(off)}$			152		
Fall Time	t_f			42		
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 Mhz		7442		pF
Output Capacitance	C_{oss}			376		
Reverse Transfer Capacitance	C_{rss}			176		

Notes

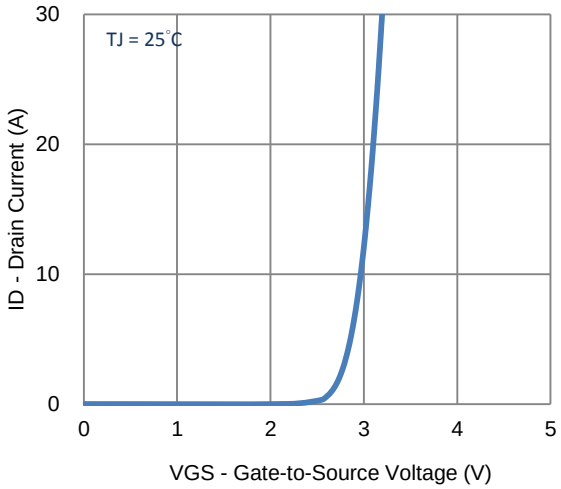
a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

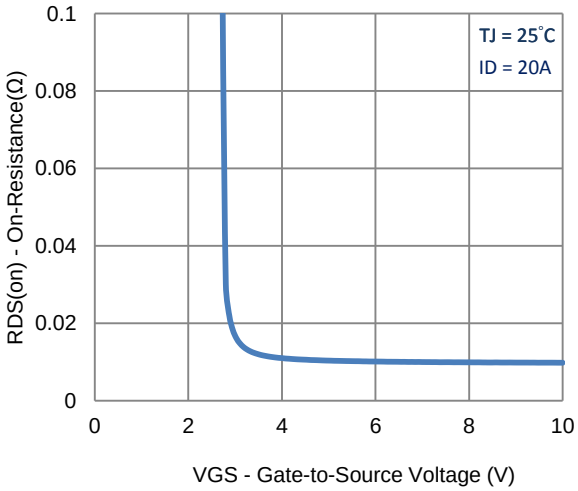
Typical Electrical Characteristics



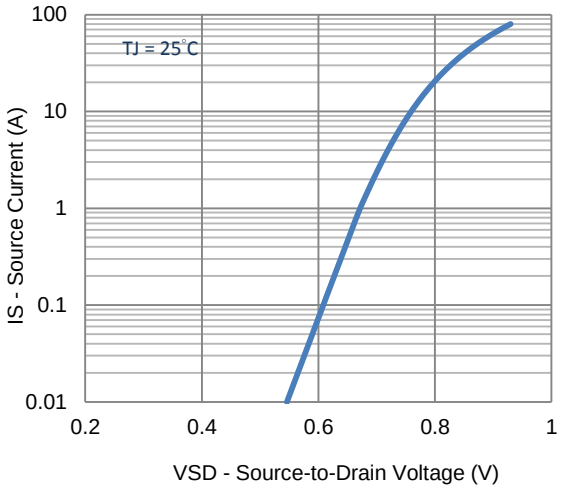
1. On-Resistance vs. Drain Current



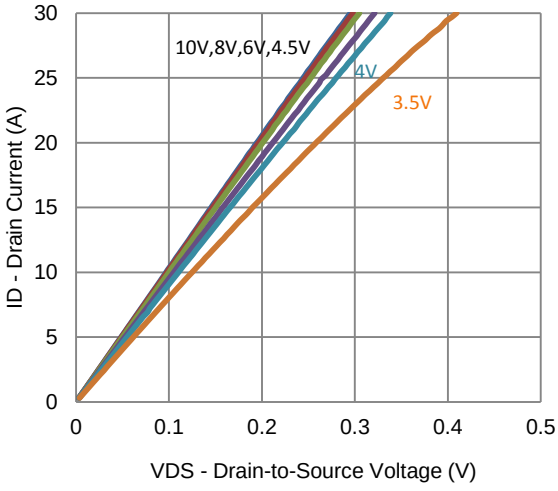
2. Transfer Characteristics



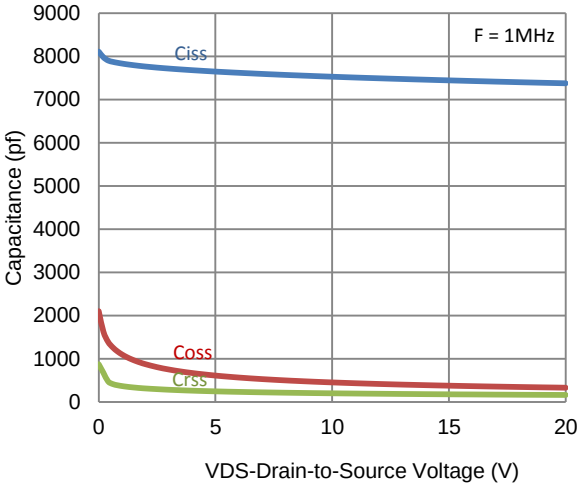
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

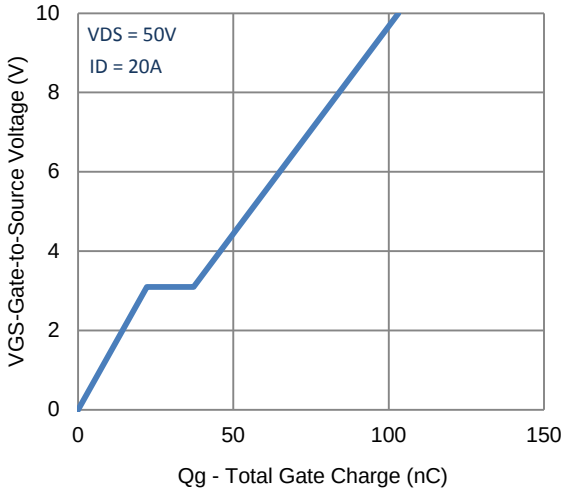


5. Output Characteristics

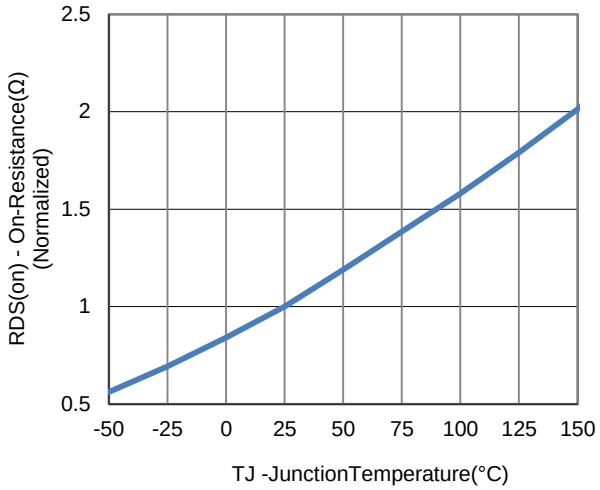


6. Capacitance

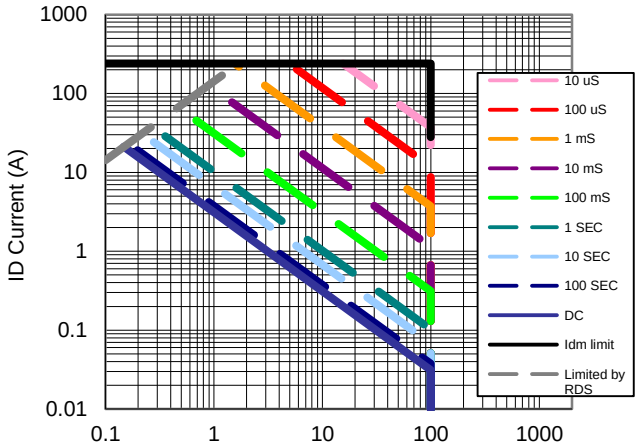
Typical Electrical Characteristics



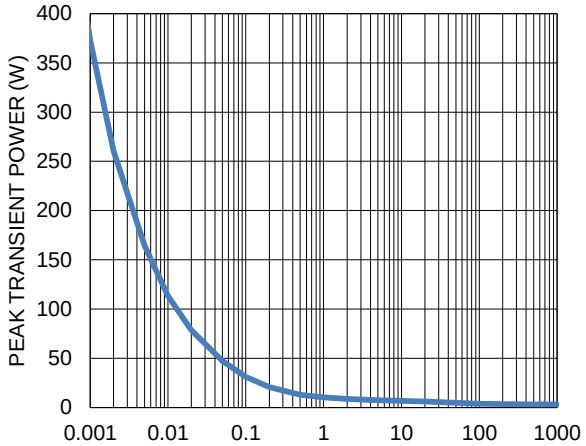
7. Gate Charge



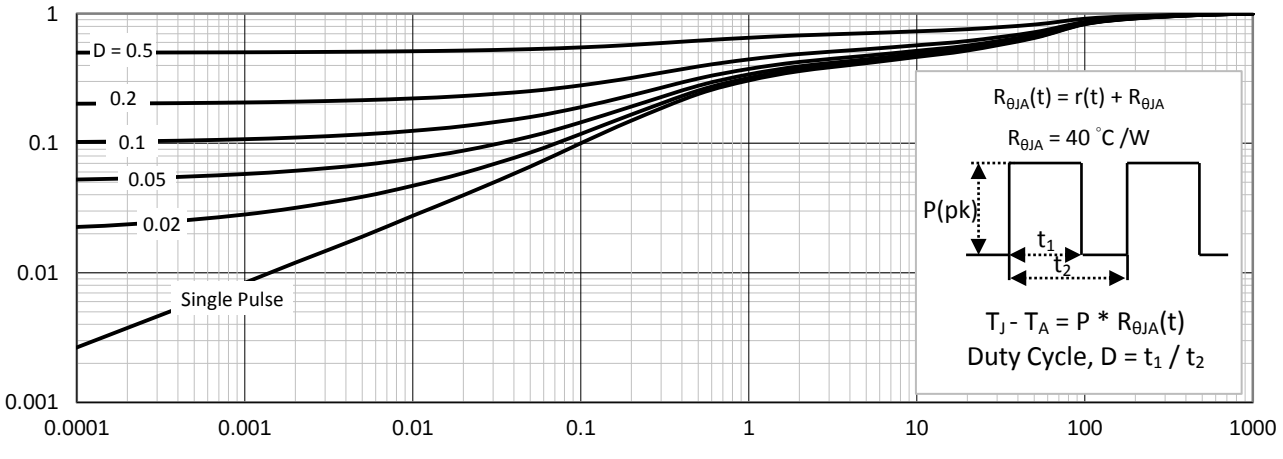
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

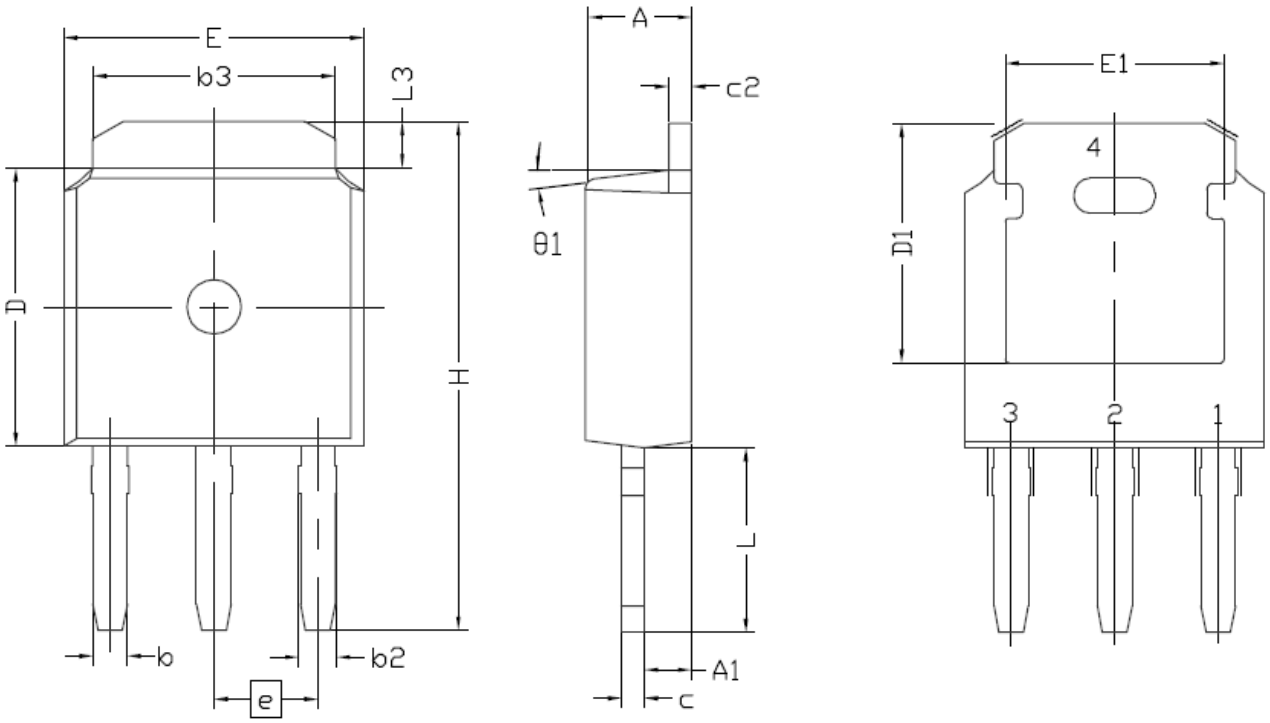


10. Single Pulse Maximum Power Dissipation



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	--	--
θ1	0°	7°	15°	0°	7°	15°