N-Channel 650-V (D-S) MOSFET

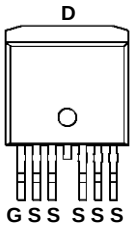
Key Features:
- Low $r_{DS(on)}$ technology
- Low thermal impedance
- Fast switching speed

Typical Applications:
- Power Supplies
- Motor Drives
- Consumer Electronics

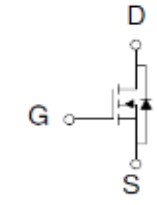
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (mΩ)	I_D (A)
650	380 @ V_{GS} = 10V	23

Pb-free
RoHS COMPLIANT
HALOGEN FREE

TO-263-6L



DRAIN connected to TAB



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Units**
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	
Continuous Drain Current [a]	T_C=25°C	I_D	23	A
Pulsed Drain Current [b]		I_{DM}	100	
Continuous Source Current (Diode Conduction) [a]	T_C=25°C	I_S	23	A
Power Dissipation [a]	T_C=25°C	P_D	300	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]	$R_{\theta JA}$	62.5	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	

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

Electrical Characteristics

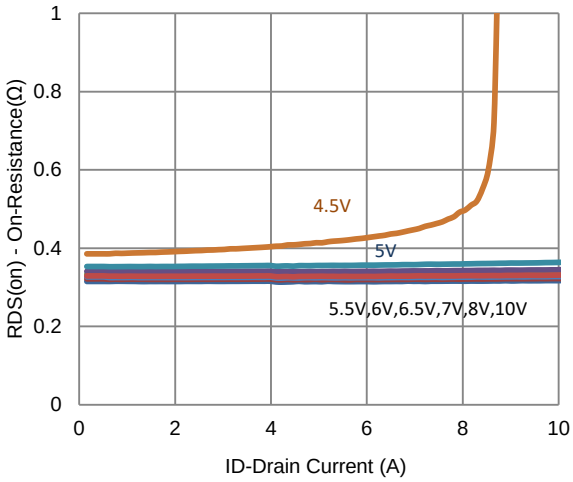
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±30 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 520 V, V_{GS} = 0 V			1	uA
		V_{DS} = 520 V, 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	35			A
Drain-Source On-Resistance [a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A			380	mΩ
Forward Transconductance [a]	g_{fs}	V_{DS} = 50 V, I_D = 10 A		12		S
Diode Forward Voltage [a]	V_{SD}	I_S = 15 A, V_{GS} = 0 V		1		V
Dynamic [b]						
Total Gate Charge	Q_g	V_{DS} = 325 V, V_{GS} = 10 V, I_D = 10 A		20		nC
Gate-Source Charge	Q_{gs}			4.7		
Gate-Drain Charge	Q_{gd}			7.7		
Turn-On Delay Time	$t_{d(on)}$	V_{DS} = 325 V, R_L = 32.5 Ω, I_D = 10 A, V_{GEN} = 10 V, R_{GEN} = 6 Ω		10		ns
Rise Time	t_r			12		
Turn-Off Delay Time	$t_{d(off)}$			96		
Fall Time	t_f			57		
Input Capacitance	C_{iss}	V_{DS} = 50, V_{GS} = 0 V, f = 1 Mhz		734		pF
Output Capacitance	C_{oss}			121		
Reverse Transfer Capacitance	C_{rss}			12		

Notes

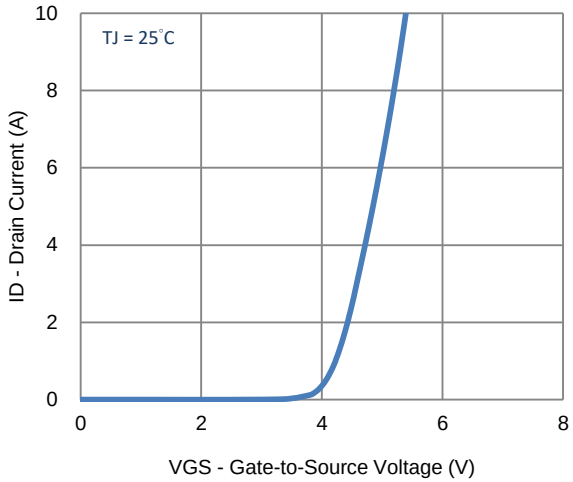
a. Pulse test: PW <= 300us duty cycle <= 2%.

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

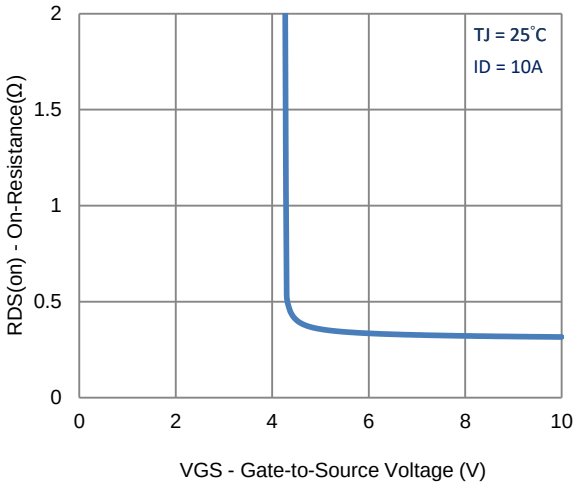
Typical Electrical Characteristics



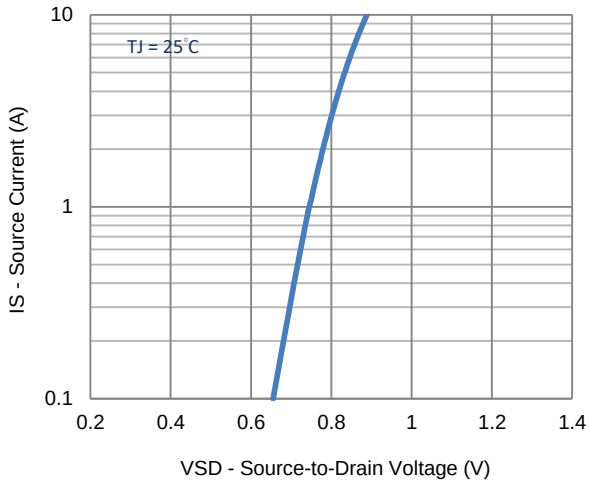
1. On-Resistance vs. Drain Current



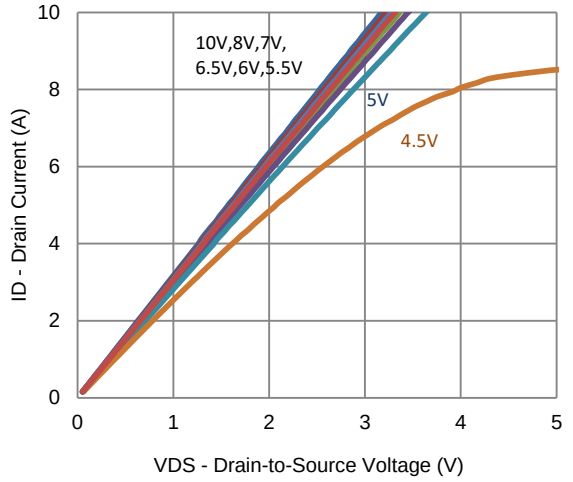
2. Transfer Characteristics



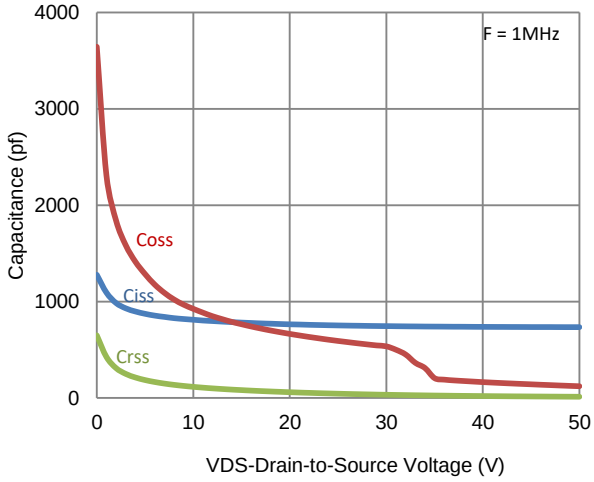
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

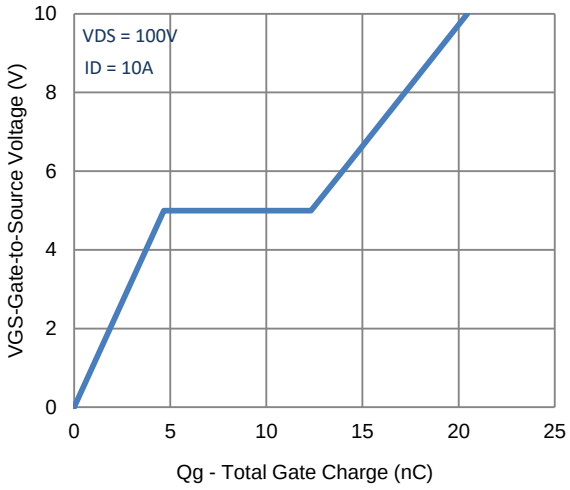


5. Output Characteristics

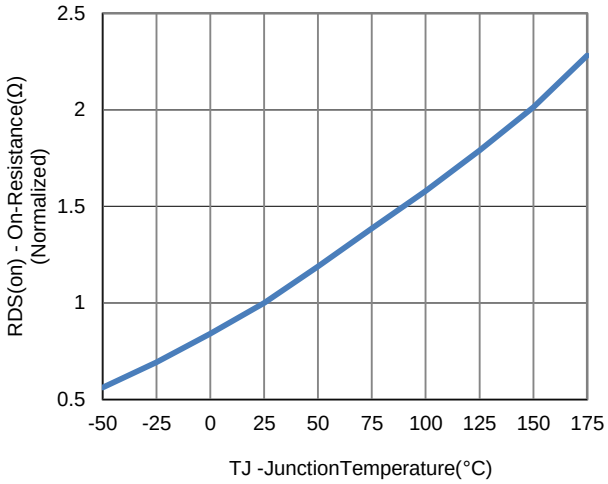


6. Capacitance

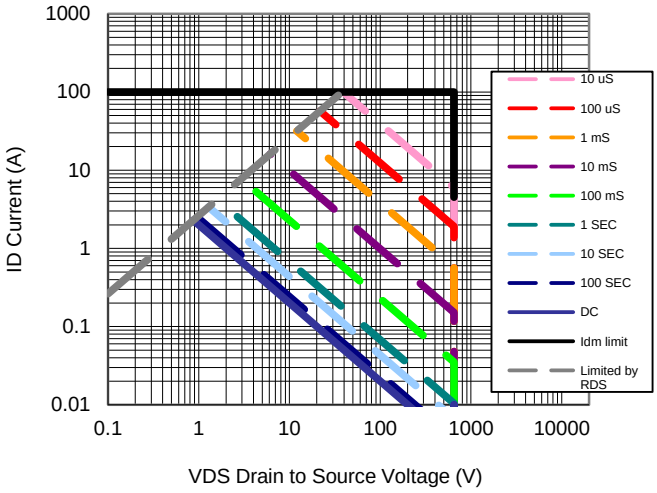
Typical Electrical Characteristics



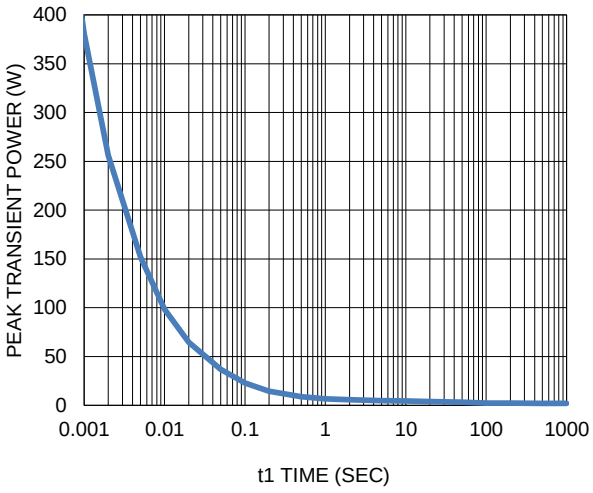
7. Gate Charge



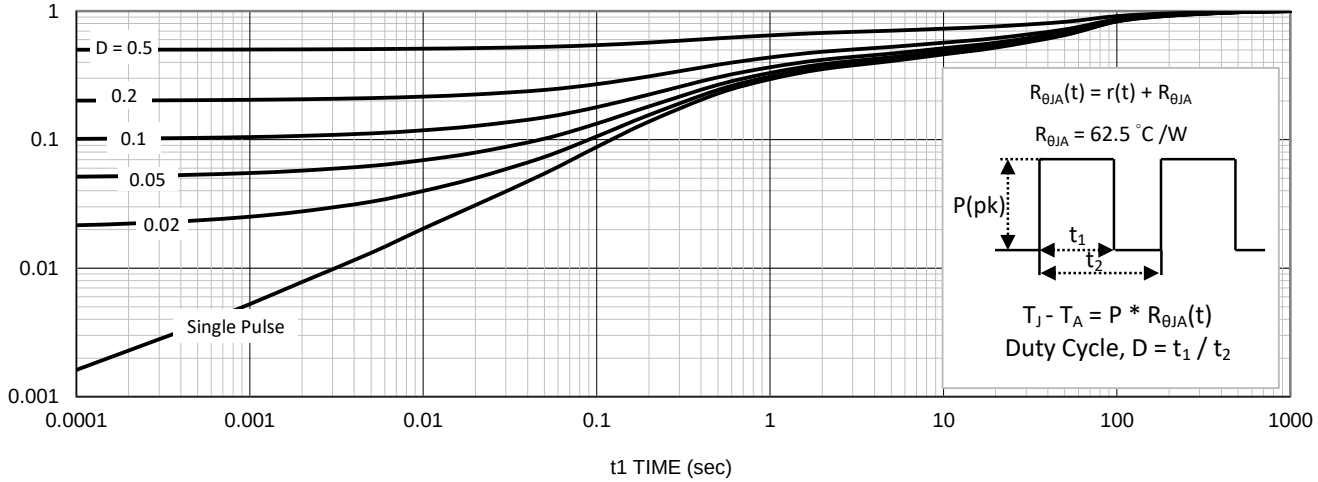
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

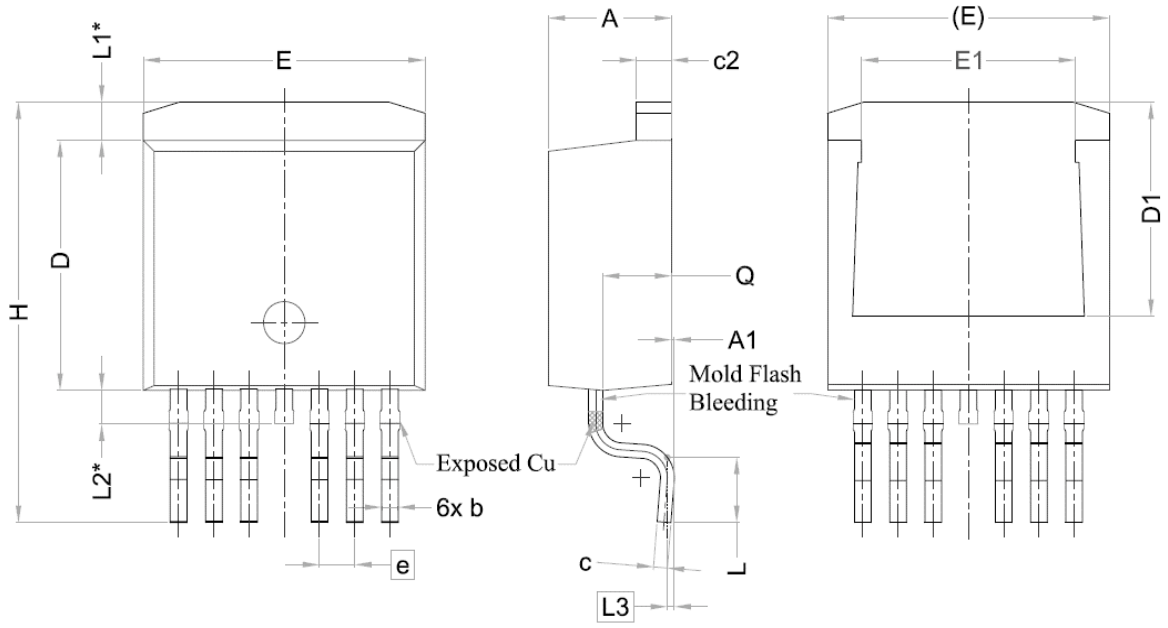


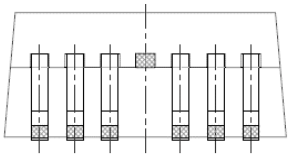
10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information





SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.50	0.60	0.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	—
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	1.27 BSC		
H	14.61	15.00	15.88
L	1.78	2.32	2.79
L1	1.36 REF.		
L2	1.20 REF.		
L3	0.25 BSC		
Q	2.30	2.48	2.70