

N-Channel 40-V (D-S) MOSFET

Key Features:

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

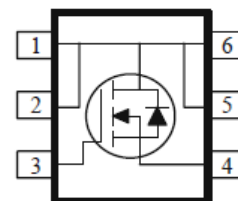
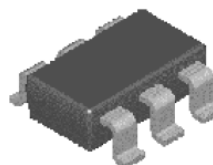
Typical Applications:

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



RoHS
COMPLIANT
HALOGEN
FREE

TSOP-6



PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
40	16 @ $V_{GS} = 10V$	9.2
	18 @ $V_{GS} = 6V$	8.7

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	9.2	A
	$T_A = 70^\circ\text{C}$		7.4	
Pulsed Drain Current ^b		I_{DM}	40	
Continuous Source Current (Diode Conduction) ^a		I_S	2.6	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	2	W
	$T_A = 70^\circ\text{C}$		1.3	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$t \leq 10 \text{ sec}$	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
	Steady State		110	

Notes

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

Electrical Characteristics

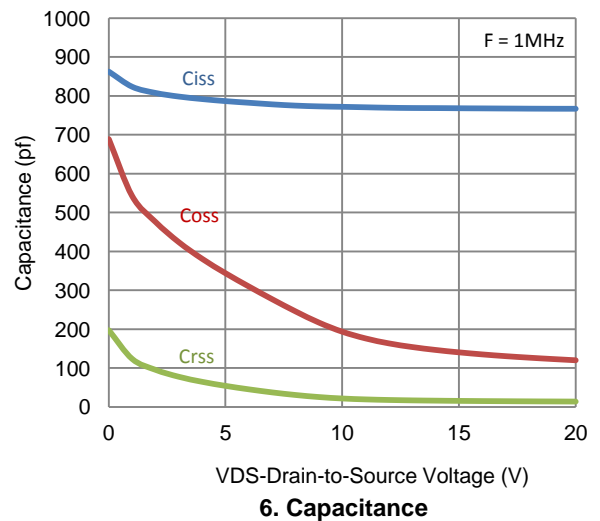
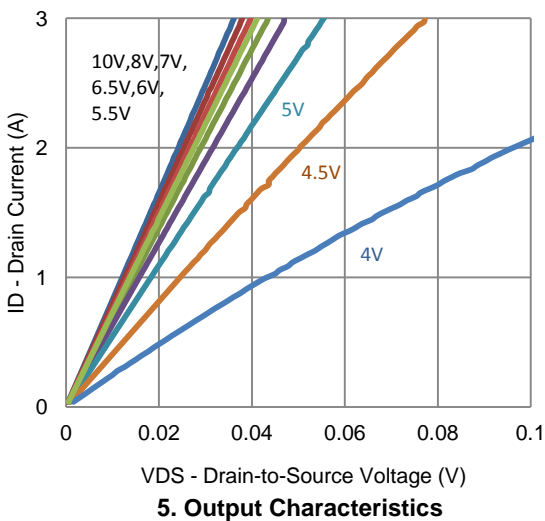
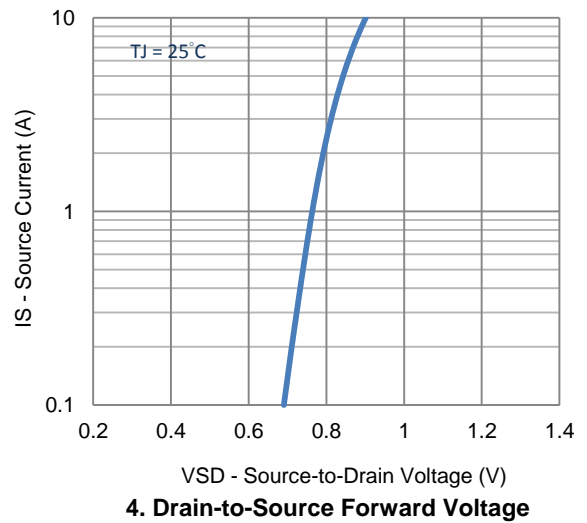
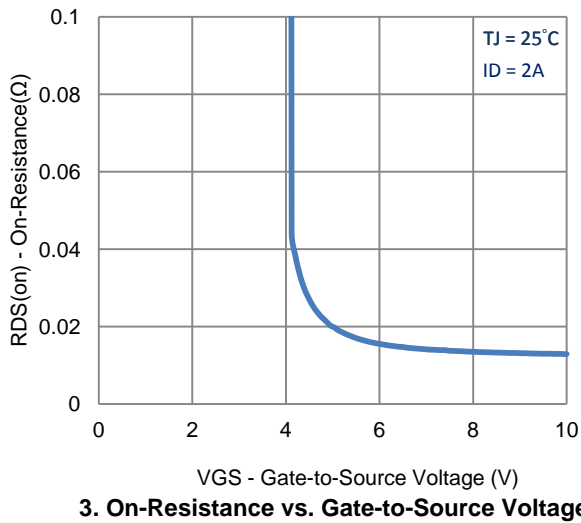
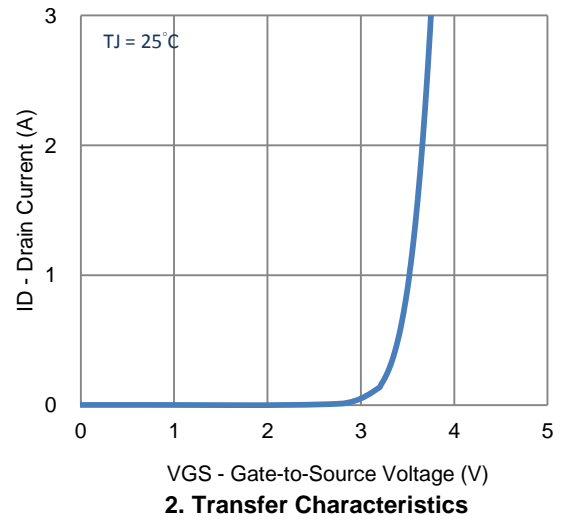
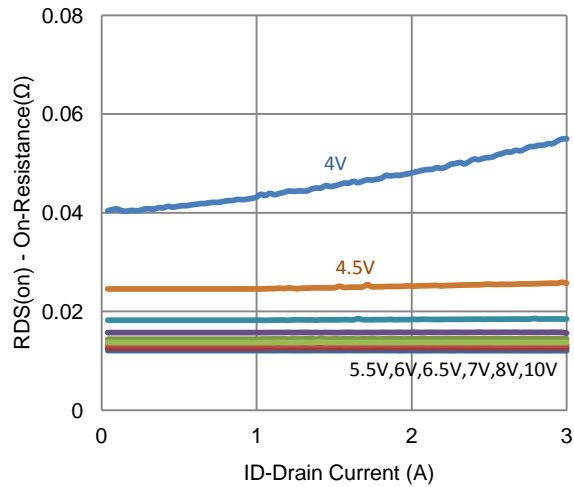
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$	1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 V$, $V_{GS} = \pm 20 V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32 V$, $V_{GS} = 0 V$			1	μA
		$V_{DS} = 32 V$, $V_{GS} = 0 V$, $T_J = 55^\circ C$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 V$, $V_{GS} = 10 V$	13.8			A
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 V$, $I_D = 3 A$			16	m Ω
		$V_{GS} = 6 V$, $I_D = 2 A$			18	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 20 V$, $I_D = 3 A$		12		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.3 A$, $V_{GS} = 0 V$		0.78		V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 20 V$, $V_{GS} = 6 V$, $I_D = 2 A$		7		nC
Gate-Source Charge	Q_{gs}			3.3		
Gate-Drain Charge	Q_{gd}			1.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 20 V$, $R_L = 10 \Omega$, $I_D = 2 A$, $V_{GEN} = 10 V$, $R_{GEN} = 6 \Omega$		7		ns
Rise Time	t_r			10		
Turn-Off Delay Time	$t_{d(off)}$			19		
Fall Time	t_f			4		
Input Capacitance	C_{iss}	$V_{DS} = 20$, $V_{GS} = 0 V$, $f = 1 \text{ Mhz}$		767		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			13		

Notes

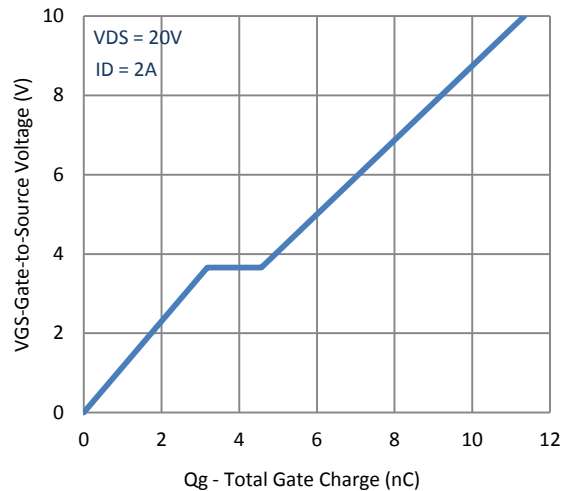
- a. Pulse test: $PW \leq 300 \mu s$ duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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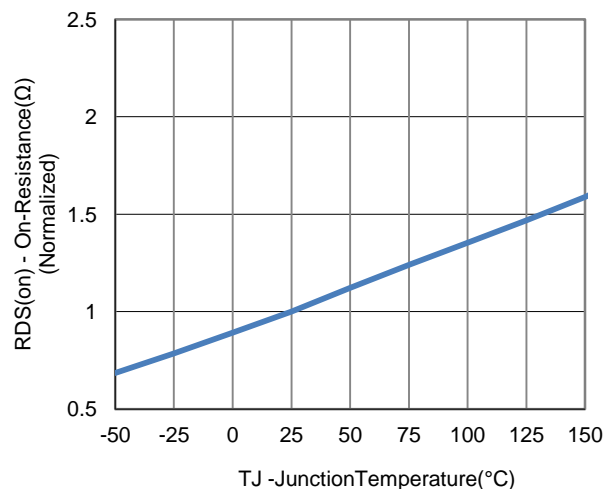
Typical Electrical Characteristics



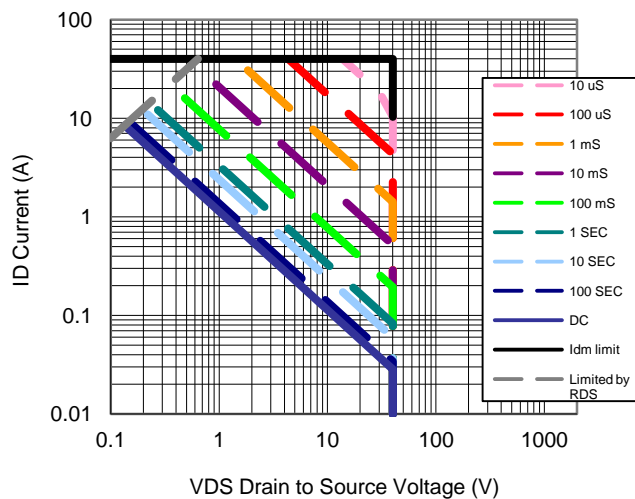
Typical Electrical Characteristics



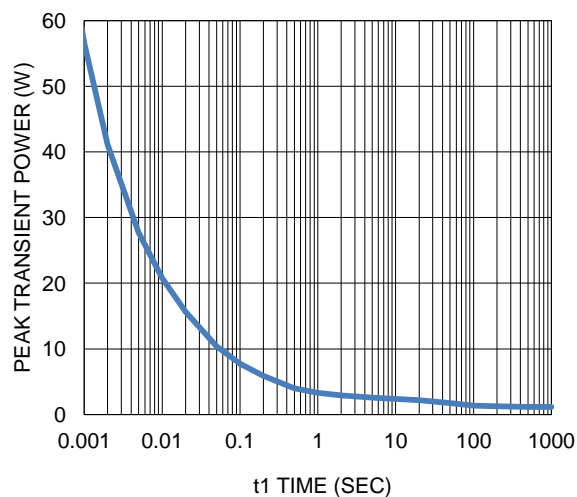
7. Gate Charge



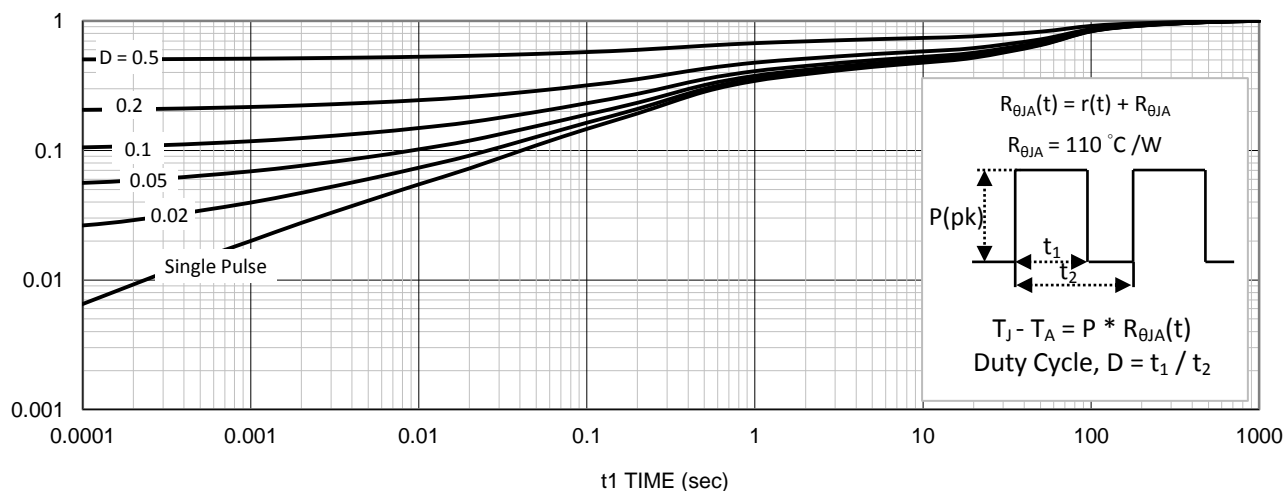
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

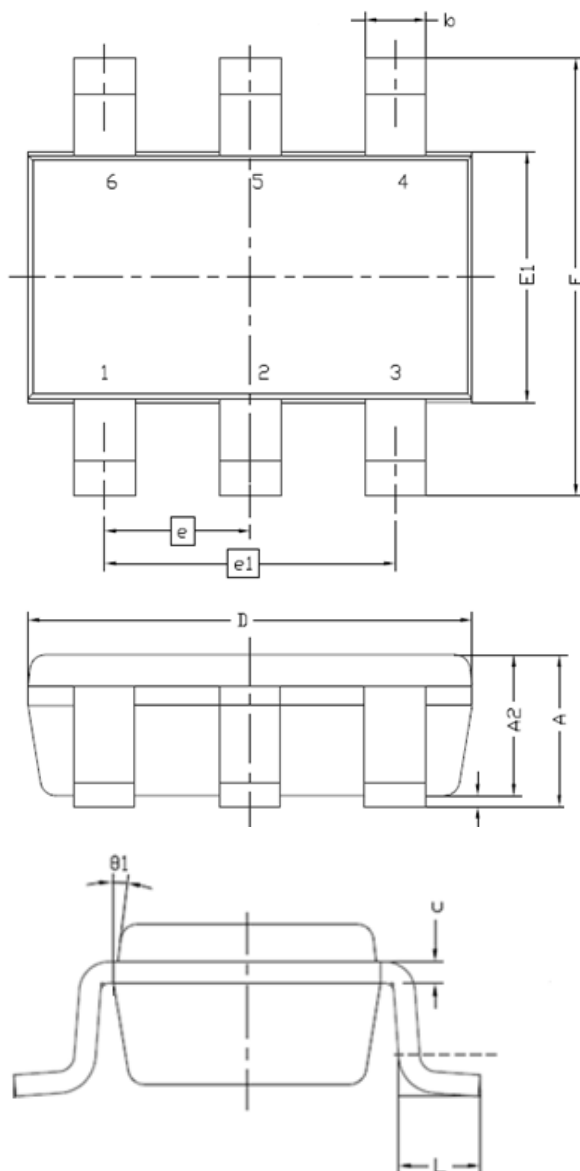


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



Symbol	MILLIMETERS	
	MIN	MAX
A	0.8	1.2
A1	0	0.1
A2	0.7	1.1
b	0.3	0.5
c	0.1	0.2
D	2.8	3.1
E	2.6	3
E1	1.4	1.7
e	0.9	1
e1	1.8	2
L	0.3	0.6
θ1	7° NOM	

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