

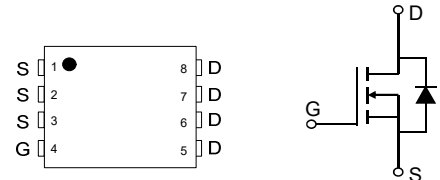
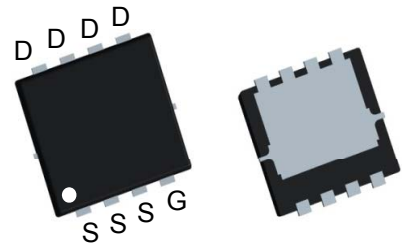
LOW VOLTAGE MOSFET (N-CHANNEL)

FEATURES

- $V_{DS}=30V, R_{DS(ON)} \leq 5m\Omega @ V_{GS}=10V, I_D=20A$
- Ultra Low on-resistance
- For Low power DC to DC converter application
- For Load switch application
- Surface Mount device

MECHANICAL DATA

- Case: PDFN3333
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.012 grams (approximate)
- Marking: Q65N03



PDFN3333

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ\text{C}$	Continuous Drain Current ¹	65	A
$I_D @ T_C=100^\circ\text{C}$	Continuous Drain Current ¹	45	A
I_{DM}	Pulsed Drain Current ²	280	A
EAS	Single Pulse Avalanche Energy ³	56	mJ
I_{AS}	Avalanche Current	40	A
$P_D @ T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	37	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=20A$		3.8	5	$m\Omega$
		$V_{GS}=4.5V, I_D=10A$		5.5	7	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.0	1.6	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=30V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	100	nA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-100	---	100	nA
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	0.85	---	Ω
Q_g	Total Gate Charge (10V)	$V_{DS}=15V, V_{GS}=10V, I_D=20A$	---	38	---	nC
Q_{gs}	Gate-Source Charge		---	5.0	---	
Q_{gd}	Gate-Drain Charge		---	12	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V, V_{GS}=10V, R_G=3\Omega, I_D=20A$	---	8.5	---	ns
T_r	Rise Time		---	9	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1920	---	pF
C_{oss}	Output Capacitance		---	300	---	
C_{rss}	Reverse Transfer Capacitance		---	260	---	

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Typical Characteristics

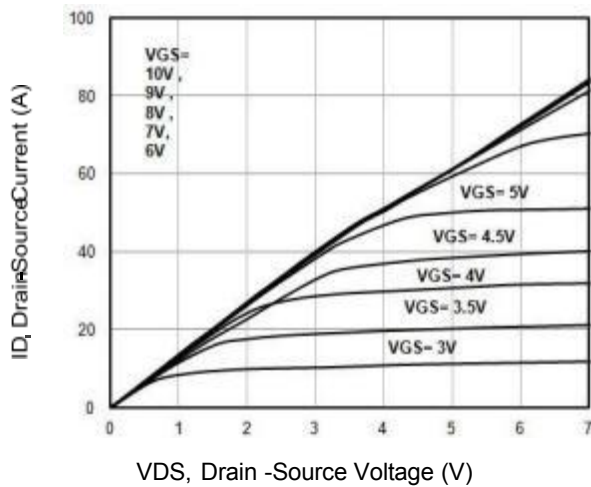


Fig1. Typical Output Characteristics

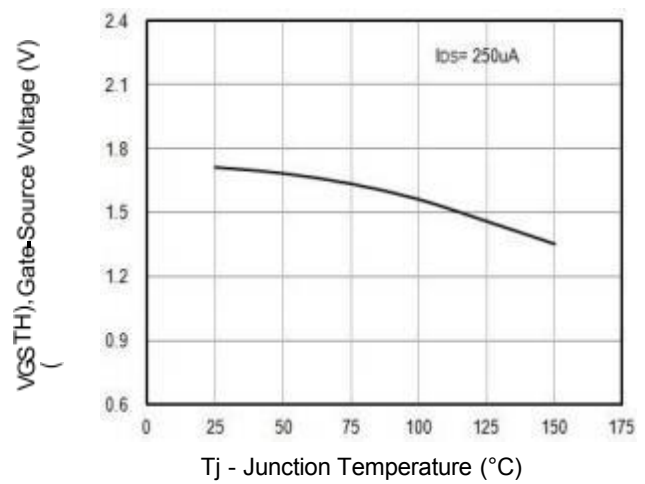


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. T_J

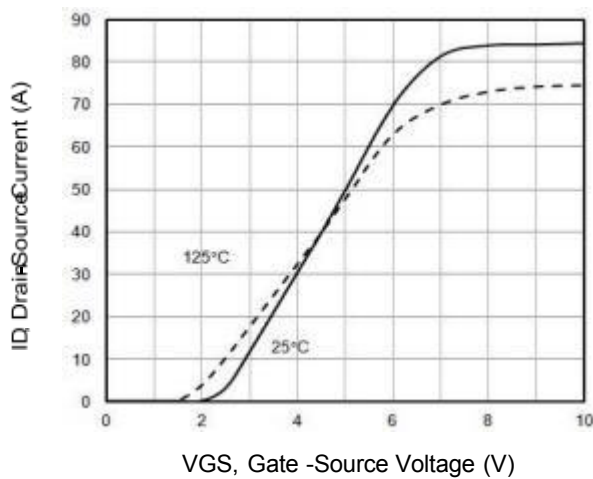


Fig3. Typical Transfer Characteristics

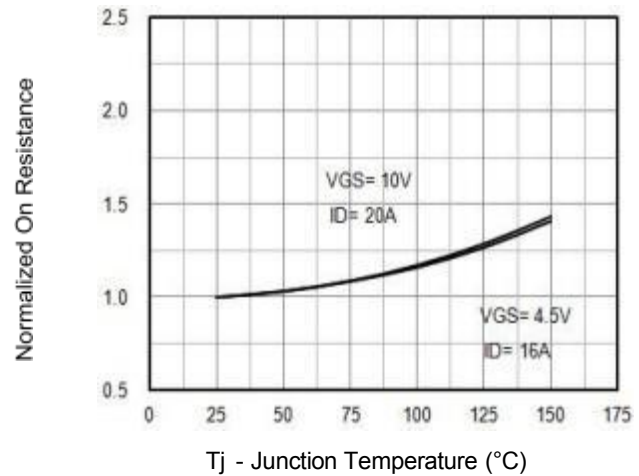


Fig4. Normalized On-Resistance Vs. T_J

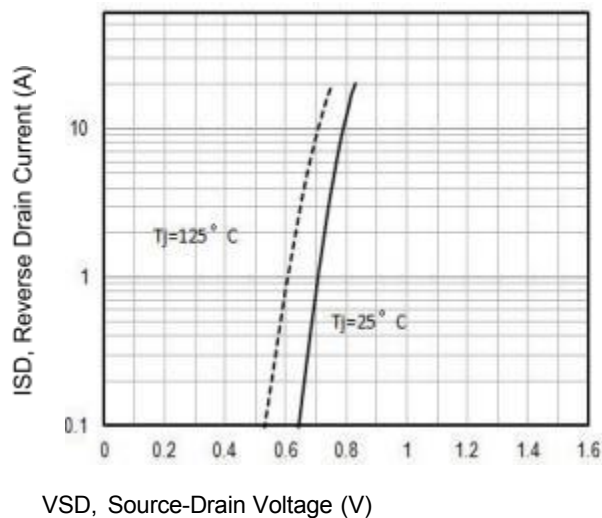


Fig6. Maximum Safe Operating Area
Voltage

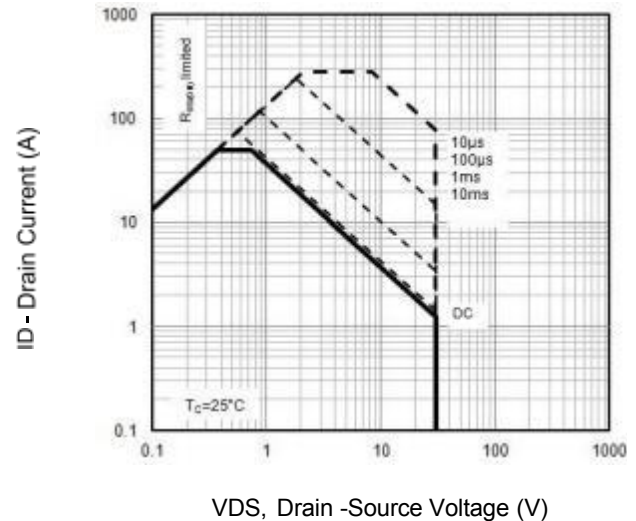


Fig5. Typical Source-Drain Diode Forward

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Typical Characteristics

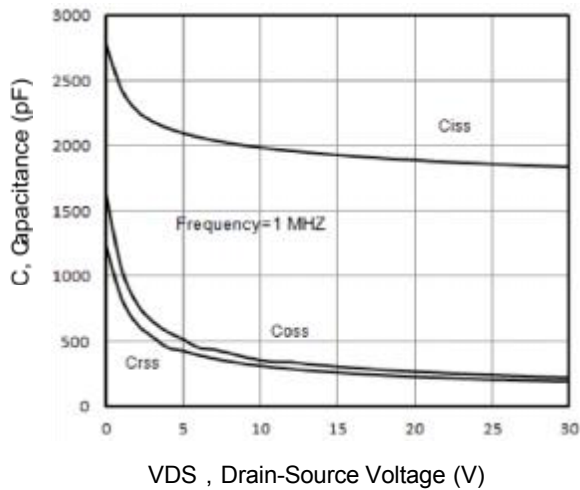


Fig7. Typical Capacitance Vs. Drain-Source Voltage

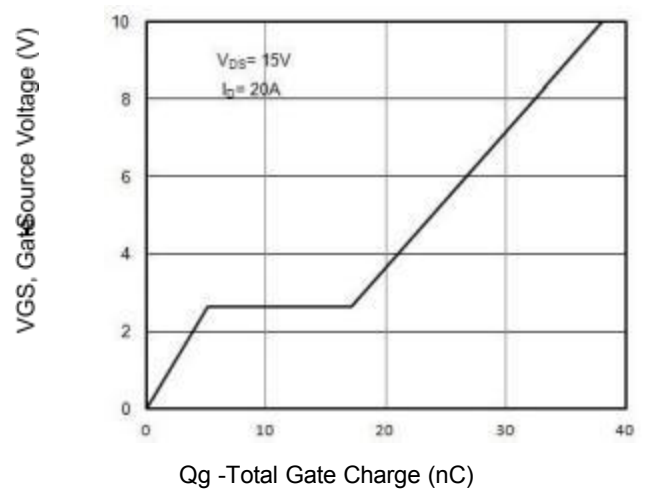


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

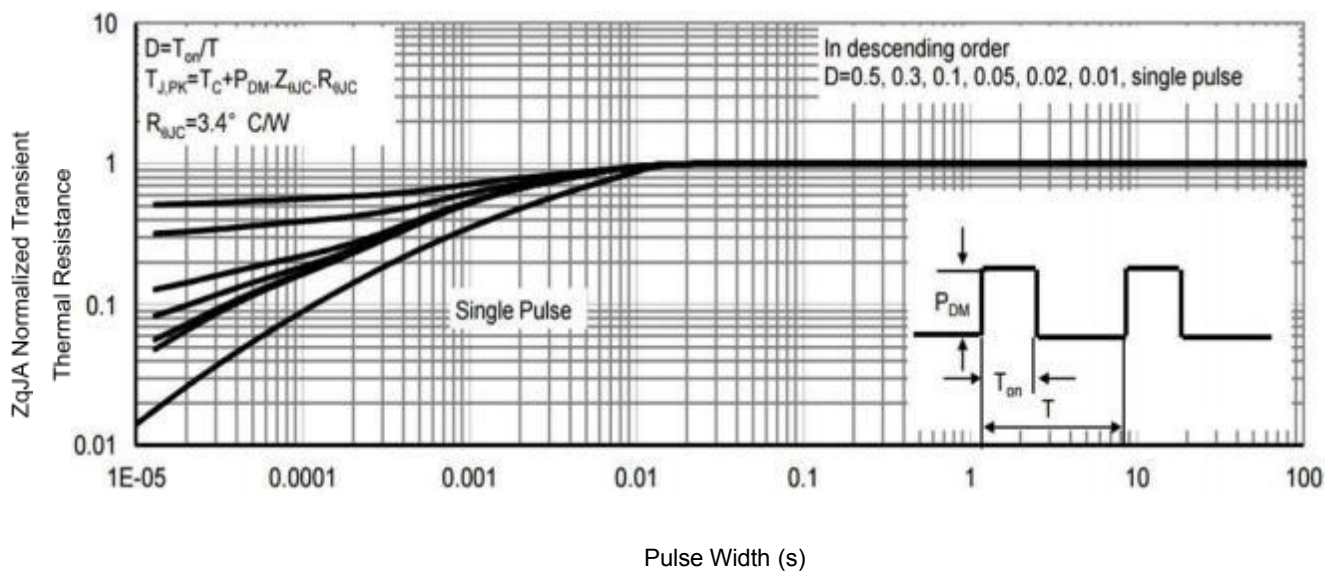


Fig9. Normalized Maximum Transient Thermal Impedance

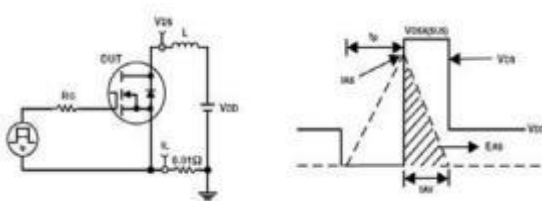


Fig10. Unclamped Inductive Test Circuit and waveforms

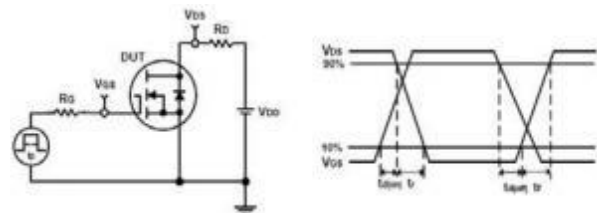
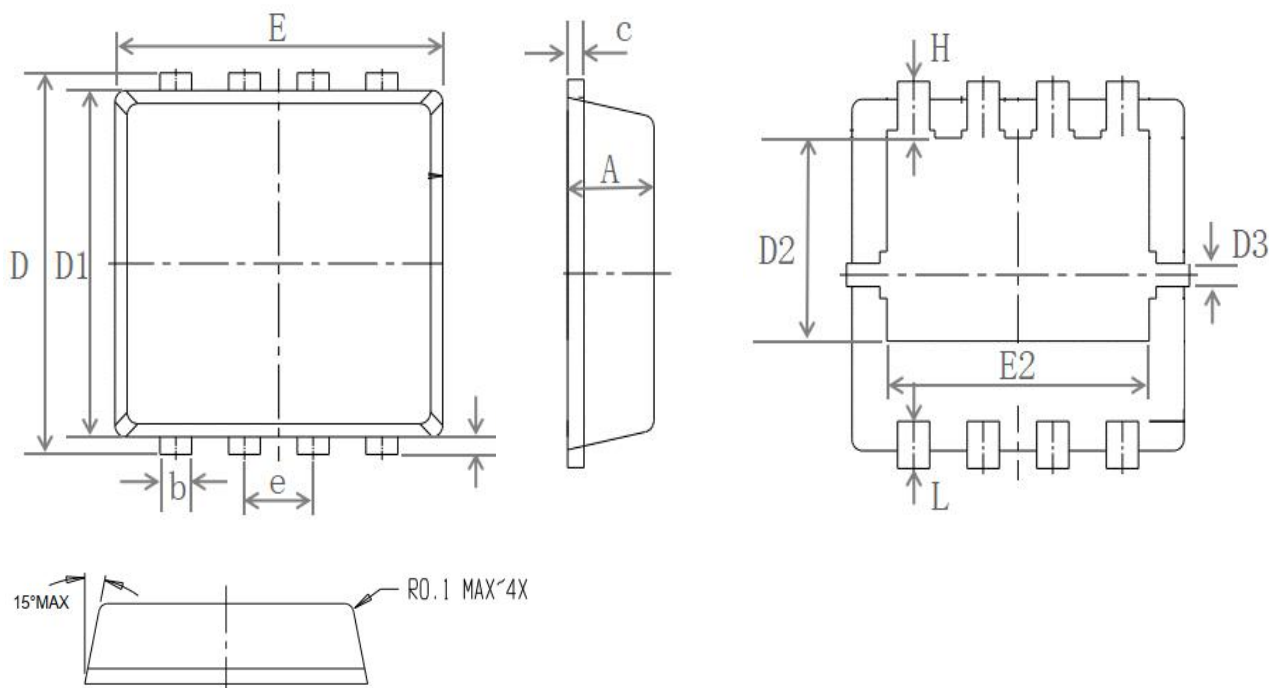


Fig11. Switching Time Test Circuit and waveforms

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PDFN3333



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.750	0.850	0.295	0.335
b	0.250	0.350	0.098	0.138
c	0.100	0.250	0.039	0.098
D	3.200	3.400	1.260	1.339
D1	2.900	3.100	1.142	1.220
D2	1.635	1.880	0.644	0.740
D3	0.100	0.300	0.039	0.118
E	3.000	3.200	1.181	1.260
E2	2.400	2.600	0.945	1.024
e	0.658REF		0.259REF	
H	0.380	0.580	0.150	0.228
L	0.300	0.500	0.118	0.197
L1	0.100	0.200	0.039	0.079