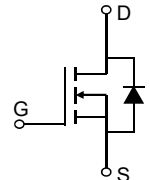
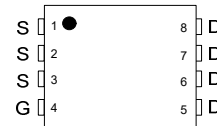
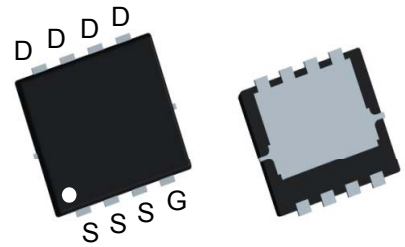


**LOW VOLTAGE MOSFET (N-CHANNEL)**
**FEATURES**

- $V_{DS}=20V, R_{DS(ON)} \leq 7.5m\Omega @ V_{GS}=2.5V, I_D= 8 A$
- Ultra Low on-resistance
- For Low power DC to DC converter application
- For Load switch application
- Surface Mount device



PDFN3333

**MECHANICAL DATA**

- Case: PDFN3333
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.012 grams (approximate)
- Marking:Q60N02

**MAXIMUM RATINGS ( $T_A = 25^\circ C$  unless otherwise noted)**

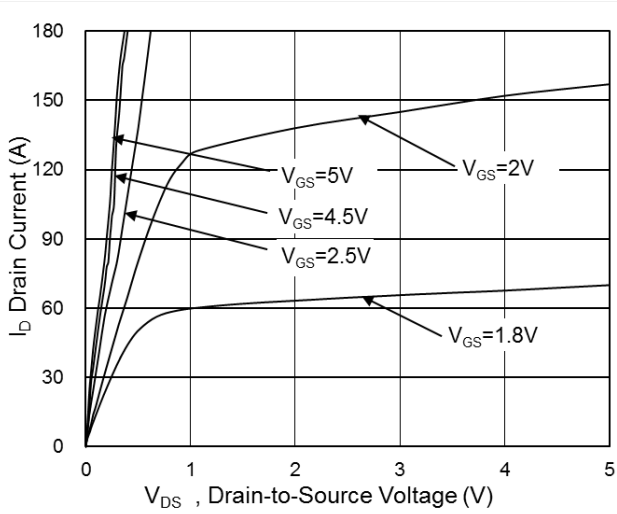
Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D @ T_C=25^\circ C$	Continuous Drain Current <sup>1</sup>	50	A
$I_D @ T_C=100^\circ C$	Continuous Drain Current <sup>1</sup>	39	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	200	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	80	mJ
$I_{AS}$	Avalanche Current	40	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation <sup>4</sup>	83	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

**ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ C$  unless otherwise specified)**

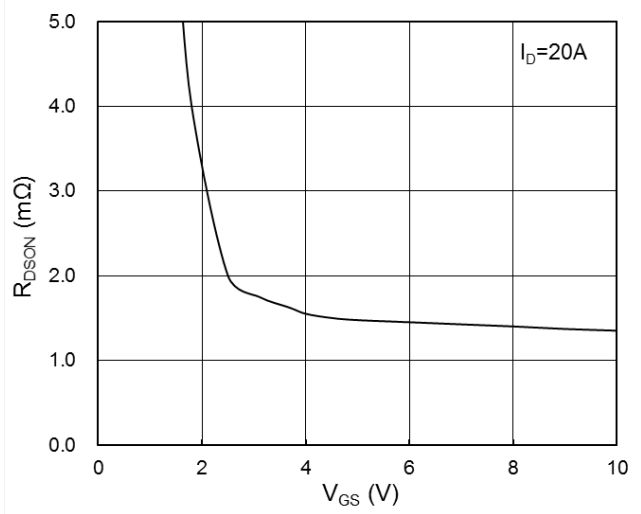
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=4.5V, I_D=10A$		4.5	5.8	m $\Omega$
		$V_{GS}=2.5V, I_D= 8 A$		6	7.5	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D =250\mu A$	0.5	0.75	1.0	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=12V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	$\mu A$
		$V_{DS}=12V, V_{GS}=0V, T_J=125^\circ C$	---	---	5	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	1.2	---	$\Omega$
$Q_g$	Total Gate Charge (10V)	$V_{DS}=20V, V_{GS}=10V, I_D=10A$	---	77	---	nC
$Q_{gs}$	Gate-Source Charge		---	8.7	---	
$Q_{gd}$	Gate-Drain Charge		---	14	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_G=3\Omega, I_D=10A$	---	10	---	ns
$T_r$	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	56	---	
$T_f$	Fall Time		---	16	---	
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	---	4300	---	pF
$C_{oss}$	Output Capacitance		---	500	---	
$C_{rss}$	Reverse Transfer Capacitance		---	320	---	

**LOW VOLTAGE MOSFET (N-CHANNEL)**

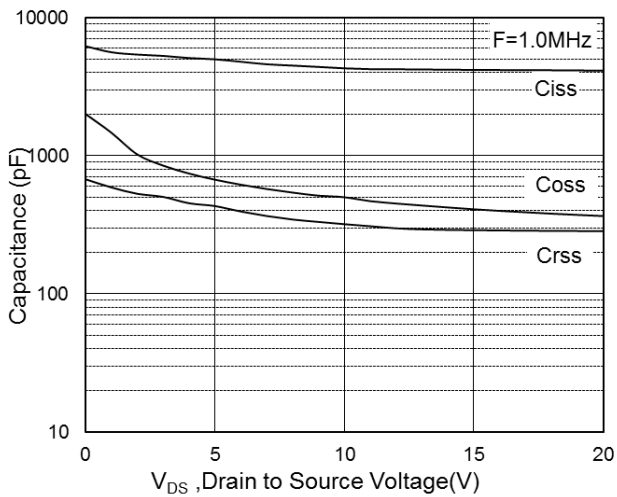
**Typical Characteristics**



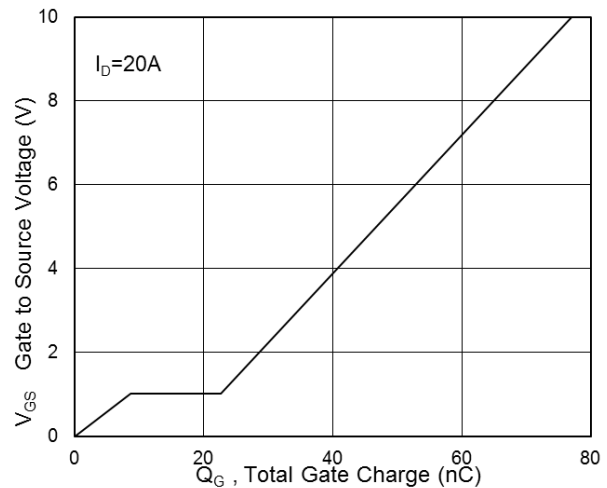
**Fig.1 Typical Output Characteristics**



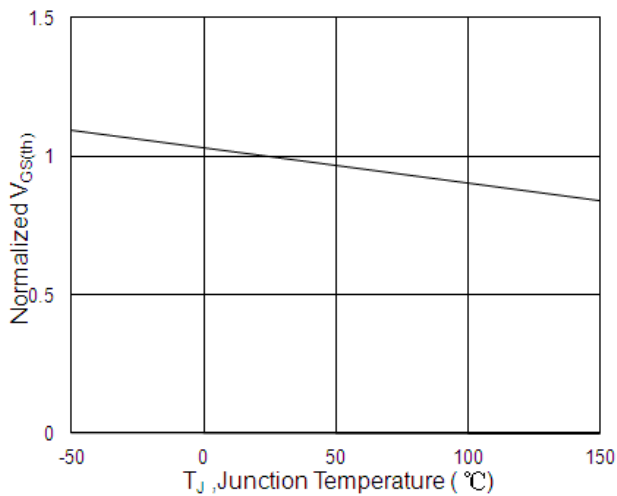
**Fig.2 On-Resistance vs. Gate-Source**



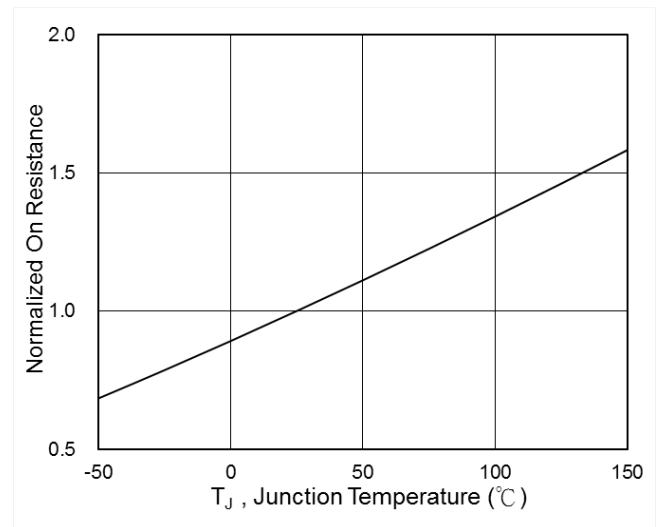
**Fig.3 Capacitance**



**Fig.4 Gate-Charge Characteristics**



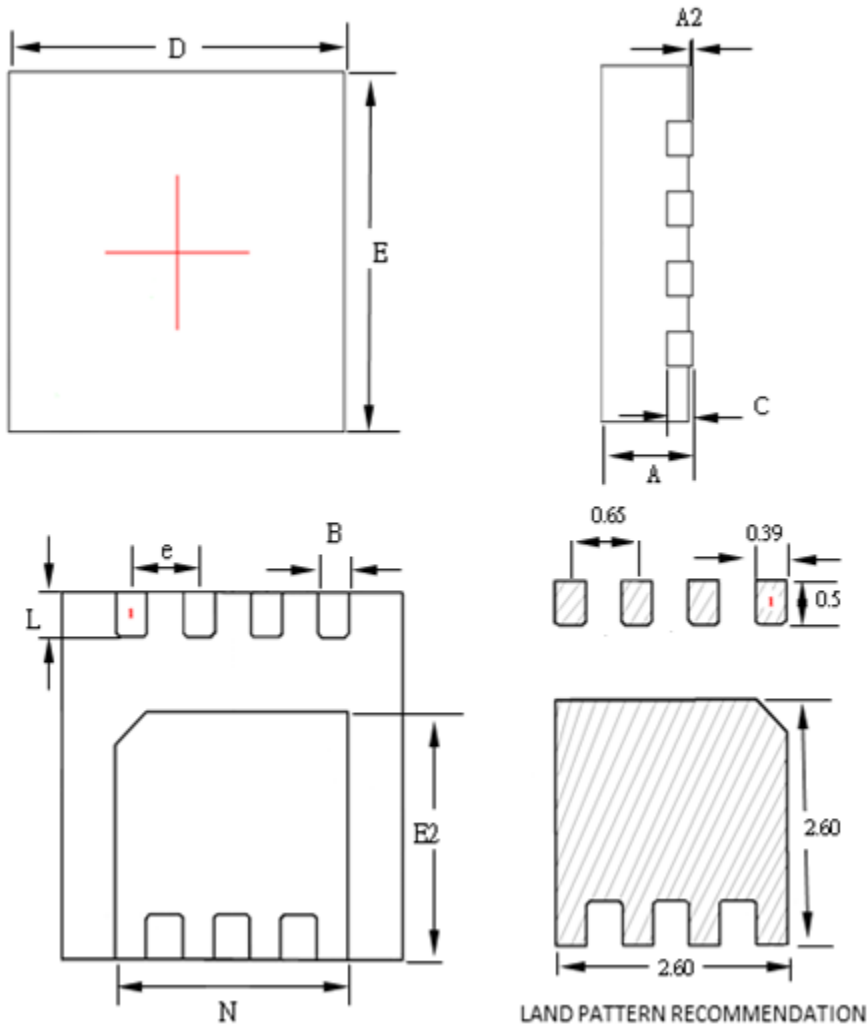
**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$**



**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**

LOW VOLTAGE MOSFET (N-CHANNEL)

PDFN3333



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A2	0.00	--	0.05	0.000	--	0.002
B	0.24	0.30	0.35	0.009	0.012	0.014
C	0.10	0.15	0.25	0.004	0.006	0.010
D	3.15	3.30	3.40	0.124	0.130	0.134
E	3.15	3.30	3.40	0.124	0.130	0.134
E2	2.15	2.25	2.35	0.085	0.089	0.093
L	0.35	0.40	0.45	0.014	0.016	0.018
N	2.10	2.25	2.35	0.083	0.089	0.093
e	--	0.65	--	--	0.026	--