

P-Channel MOSFET

60V 15A DFN3333-8L AEC-Q101

MFT6P15D33A

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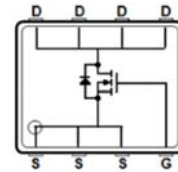
FEATURE

- $R_{DS(ON)} < 48m\Omega$, $V_{GS} = -10V$, $I_D = -5.0A$
- $R_{DS(ON)} < 65m\Omega$, $V_{GS} = -4.5V$, $I_D = -3.0A$
- AEC-Q101 Qualified



MECHANICAL DATA

- Case: DFN3333-8L package
- Terminal: Solderable per MIL-STD-750, Method 2026

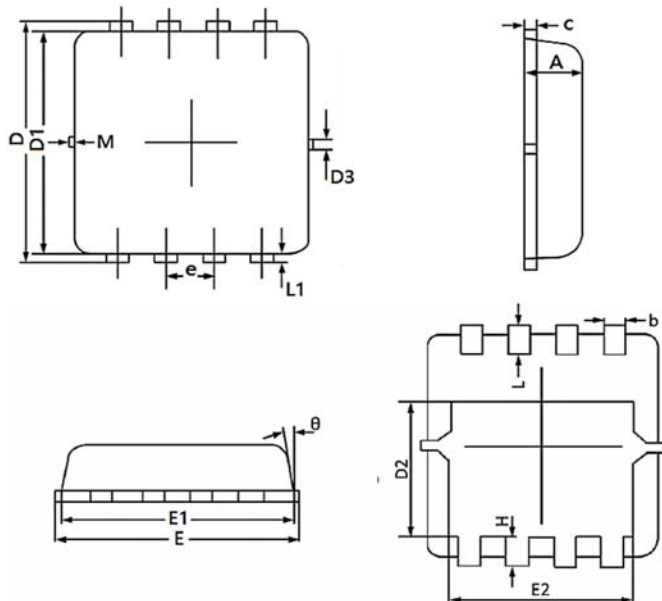


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C = 25^\circ C$	I_D	-15	A
	$T_C = 100^\circ C$		-10	
	$T_A = 25^\circ C$		-5	
	$T_A = 70^\circ C$		-4	
Drain Current – Pulsed	$T_C = 25^\circ C$	I_{DM}	-60	A
Power Dissipation	$T_C = 25^\circ C$	P_D	20	W
	$T_C = 100^\circ C$		8	W
	$T_A = 25^\circ C$		2	W
	$T_A = 70^\circ C$		1.3	W
Single Pulse Avalanche Energy		E_{AS}	51	mJ
Typical Thermal Resistance, Junction to Case		$R_{\theta JC}$	6.3	$^\circ C/W$
Typical Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	62.5	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	$^\circ C$

DIMENSIONS

Item	Min	Max
A	0.70	0.80
b	0.25	0.35
c	0.10	0.25
D	3.25	3.45
D1	3.00	3.20
D2	1.78	1.98
D3	0.130 REF	
E	3.20	3.40
E1	3.00	3.20
E2	2.39	2.59
e	0.650 BSC	
H	0.30	0.50
L	0.30	0.50
L1	0.130 REF	
θ	0°	12°



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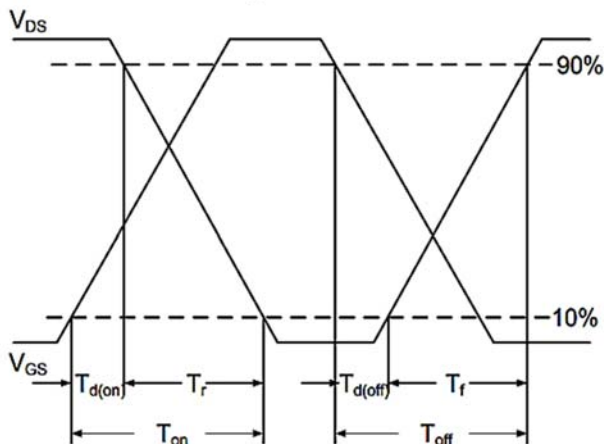
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ELECTRICAL CHARACTERISTICS

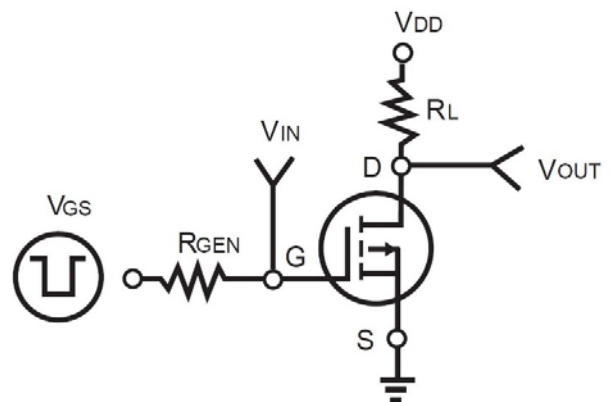
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-60	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=-60V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	--	--	-1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-5A$	$R_{DS(on)}$	--	40	48	m Ω
	$V_{GS}=-4.5V, I_D=-3A$		--	55	65	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1.0	-1.7	-2.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=-30V, I_D=-10A$ $V_{GS}=-5V$	Q_g	--	22	--	nC
Gate-Source Charge		Q_{gs}	--	4.1	--	
Gate-Drain Charge		Q_{gd}	--	5.2	--	
Turn-On Delay Time	$V_{DD}=-30V, I_D=-1A$ $V_{GS}=-10V, R_G=6\Omega$	$T_{d(on)}$	--	13	--	ns
Rise Time		T_r	--	42	--	
Turn-Off Delay Time		$T_{d(off)}$	--	65	--	
Fall Time		T_f	--	16	--	
Input Capacitance	$V_{DS}=-30V, V_{GS}=0V,$ $f=1MHz$	C_{iss}	--	1256	--	pF
Output Capacitance		C_{oss}	--	87	--	
Reverse Transfer Capacitance		C_{rss}	--	59	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Continuous Source Current	---	I_S	--	--	-15	A
Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	V_{SD}	--	-0.7	-1	V

- Note:
1. Pulse width < 300 μs , Duty cycle < 2%
 2. Essentially independent of operating temperature typical characteristics
 3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ C$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ C$.
 4. The maximum current rating is package limited
 5. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch² with 2oz. square pad of copper
 6. Guaranteed by design, not subject to production testing.

Switching Time Waveform



Switching Test Circuit

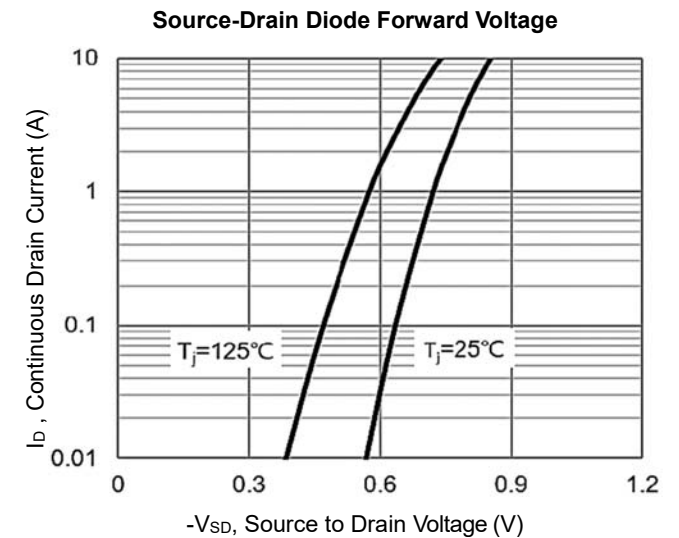
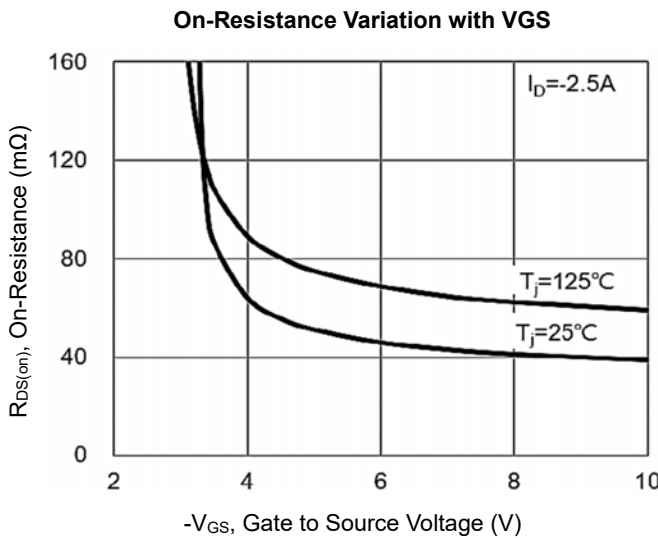
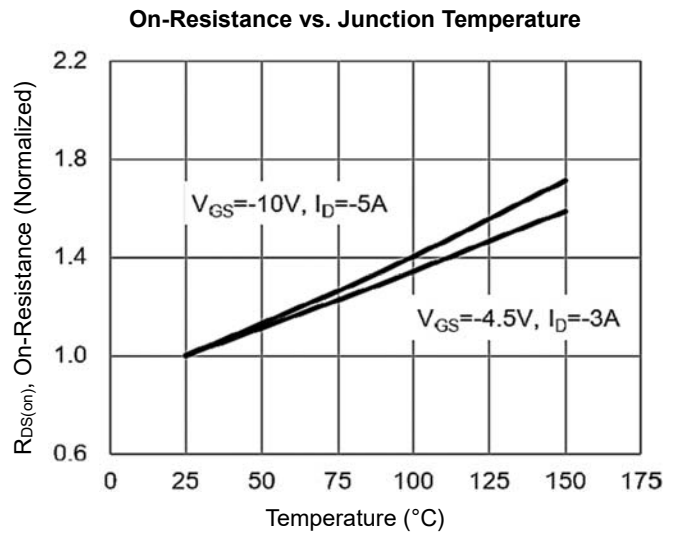
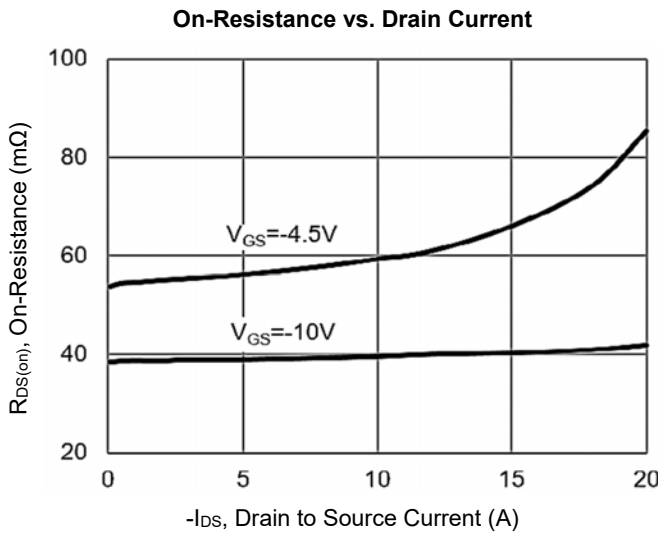
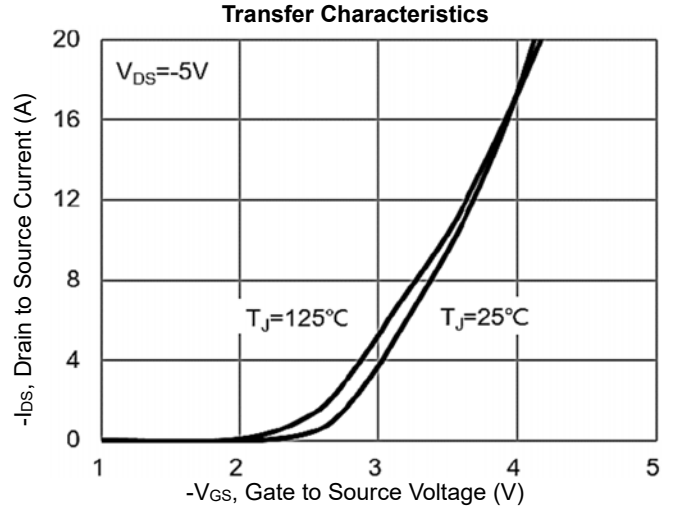
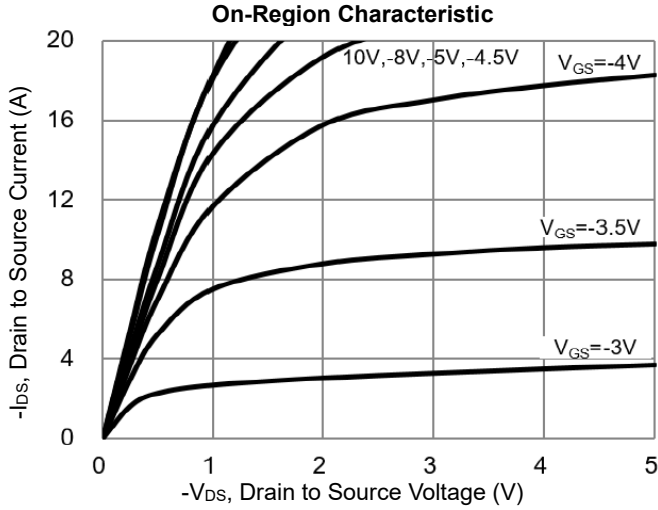


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CHARACTERISTIC CURVES



P-Channel MOSFET

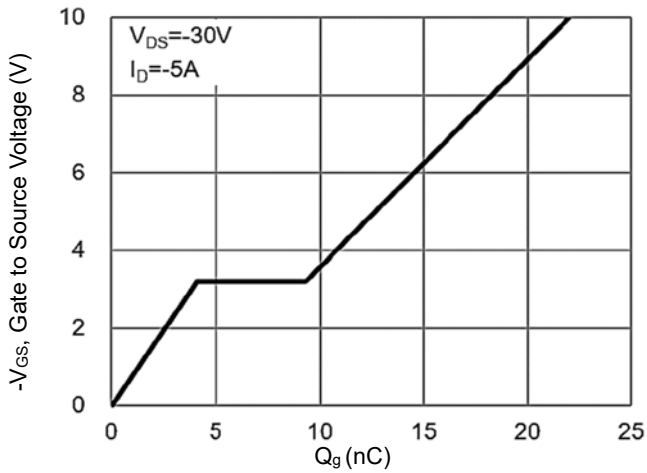
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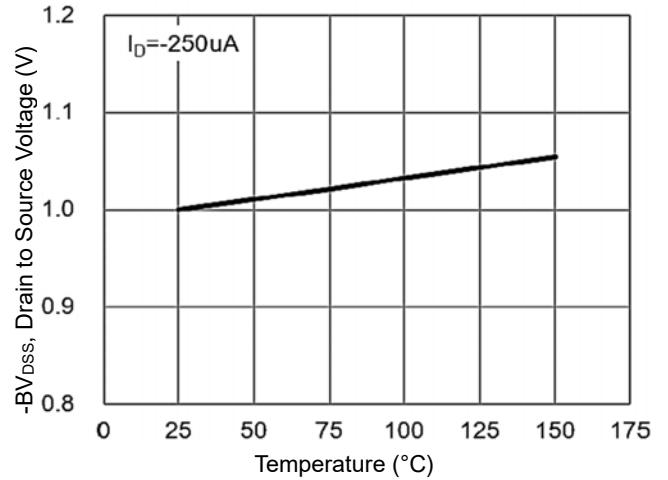
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CHARACTERISTIC CURVES

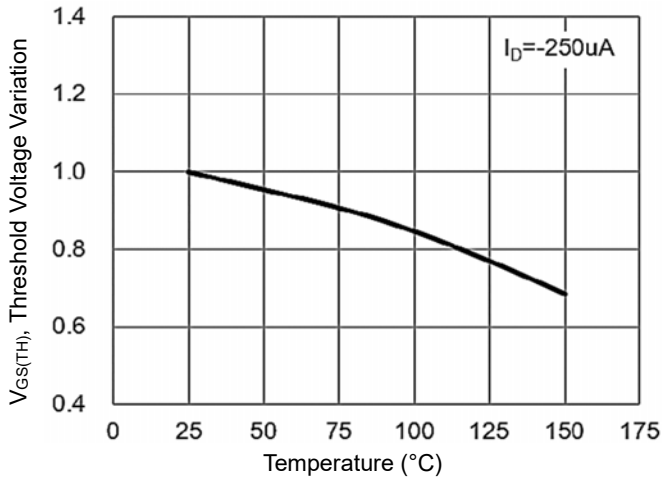
Gate-Charge Characteristics



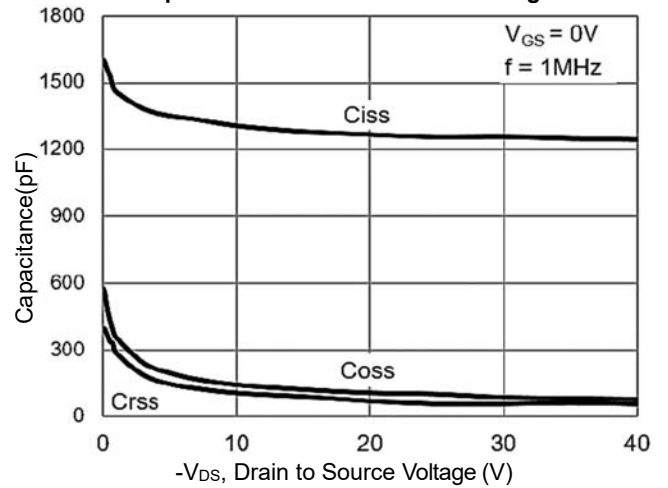
Breakdown Voltage Variation vs. Temperature



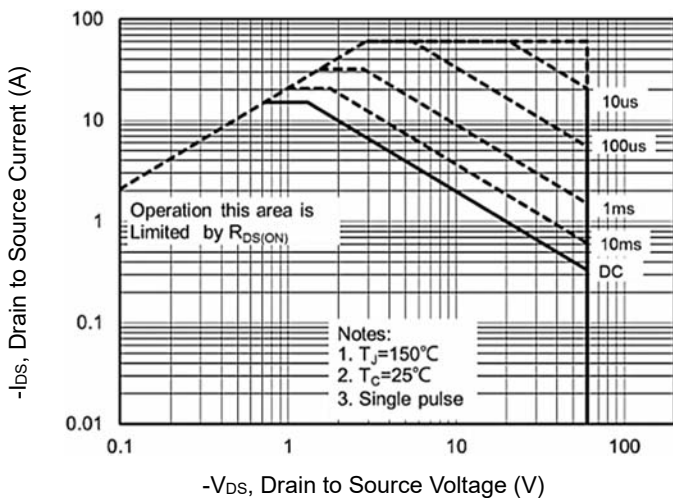
Threshold Voltage Variation with Temperature



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance

