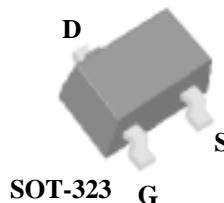




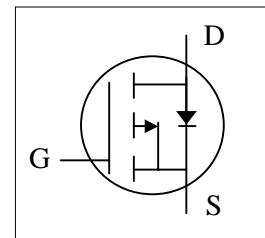
- ▼ Simple Gate Drive
- ▼ Small Package Outline
- ▼ Fast Switching Speed



BV_{DSS}	-20V
$R_{DS(ON)}$	800mΩ
I_D	-550mA

Description

The Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current ³	-550	mA
$I_D @ T_A = 70^\circ C$	Continuous Drain Current ³	-440	mA
I_{DM}	Pulsed Drain Current ^{1,2}	2.5	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	0.35	W
	Linear Derating Factor	0.003	W/°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Unit
R_{thj-a}	Thermal Resistance Junction-ambient ³	Max.	°C/W



Electrical Characteristics@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=-250\mu\text{A}$	-20	-	-	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25°C , $I_{\text{D}}=-1\text{mA}$	-	0.01	-	$\text{V}/^\circ\text{C}$
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{\text{GS}}=-10\text{V}, I_{\text{D}}=-550\text{mA}$	-	-	600	$\text{m}\Omega$
		$V_{\text{GS}}=-4.5\text{V}, I_{\text{D}}=-500\text{mA}$	-	-	800	$\text{m}\Omega$
		$V_{\text{GS}}=-2.5\text{V}, I_{\text{D}}=-300\text{mA}$	-	-	1000	$\text{m}\Omega$
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=-250\mu\text{A}$	-0.5	-	-1.2	V
g_{fs}	Forward Transconductance	$V_{\text{DS}}=-5\text{V}, I_{\text{D}}=-500\text{mA}$	-	1	-	S
I_{DSS}	Drain-Source Leakage Current ($T_j=25^\circ\text{C}$)	$V_{\text{DS}}=-20\text{V}, V_{\text{GS}}=0\text{V}$	-	-	-1	uA
	Drain-Source Leakage Current ($T_j=70^\circ\text{C}$)	$V_{\text{DS}}=-16\text{V}, V_{\text{GS}}=0\text{V}$	-	-	-10	uA
I_{GSS}	Gate-Source Leakage	$V_{\text{GS}}=\pm 12\text{V}$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_{\text{D}}=-500\text{mA}$	-	1.7	2.7	nC
Q_{gs}	Gate-Source Charge	$V_{\text{DS}}=-16\text{V}$	-	0.3	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{\text{GS}}=-4.5\text{V}$	-	0.4	-	nC
$t_{\text{d(on)}}$	Turn-on Delay Time ²	$V_{\text{DS}}=-10\text{V}$	-	5	-	ns
t_r	Rise Time	$I_{\text{D}}=-500\text{mA}$	-	8	-	ns
$t_{\text{d(off)}}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{\text{GS}}=-5\text{V}$	-	10	-	ns
t_f	Fall Time	$R_D=20\Omega$	-	2	-	ns
C_{iss}	Input Capacitance	$V_{\text{GS}}=0\text{V}$	-	66	105.6	pF
C_{oss}	Output Capacitance	$V_{\text{DS}}=-10\text{V}$	-	25	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	20	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Forward On Voltage ²	$I_{\text{S}}=-300\text{mA}, V_{\text{GS}}=0\text{V}$	-	-	-1.2	V

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
- 3.Surface mounted on FR4 board, $t \leq 10$ sec.

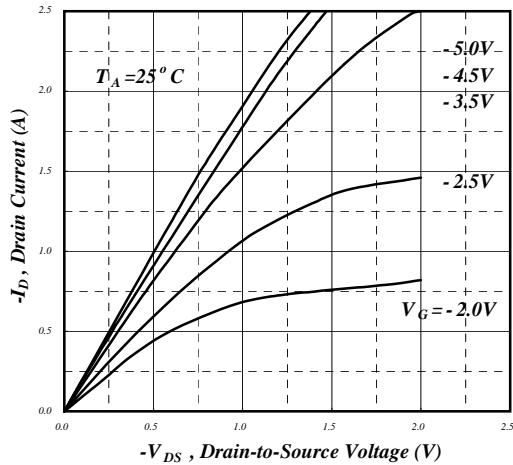


Fig 1. Typical Output Characteristics

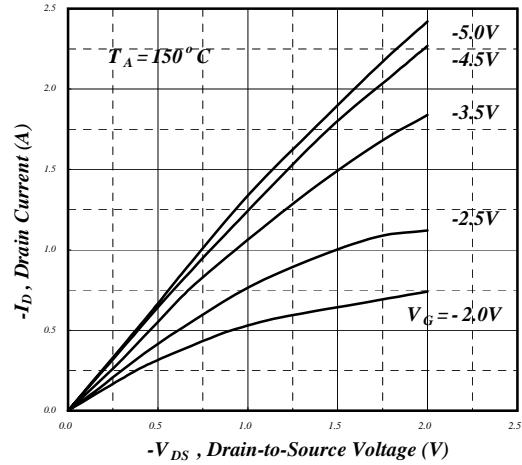


Fig 2. Typical Output Characteristics

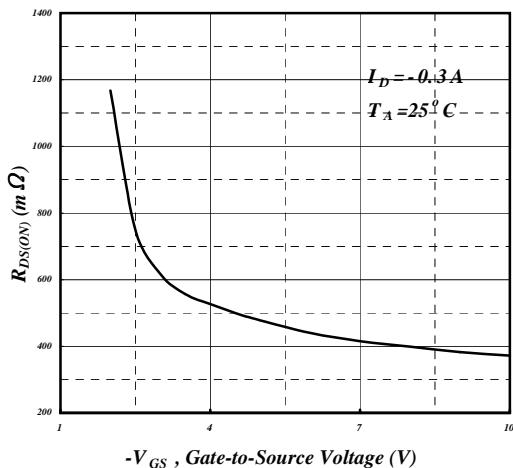


Fig 3. On-Resistance v.s. Gate Voltage

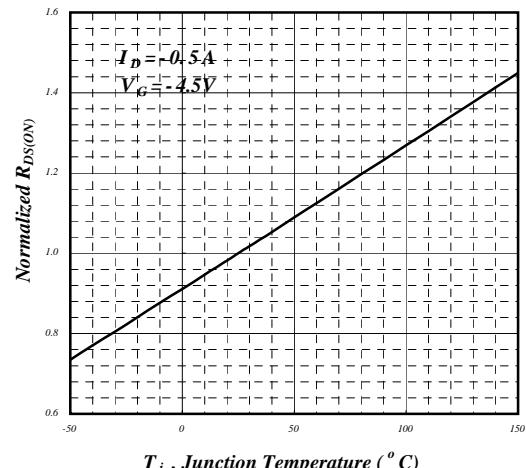


Fig 4. Normalized On-Resistance v.s. Junction Temperature

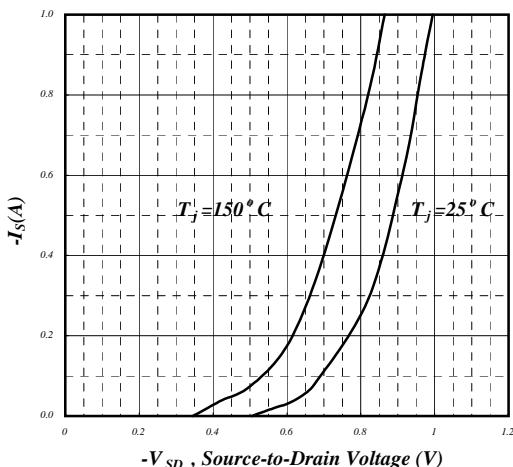


Fig 5. Forward Characteristic of Reverse Diode

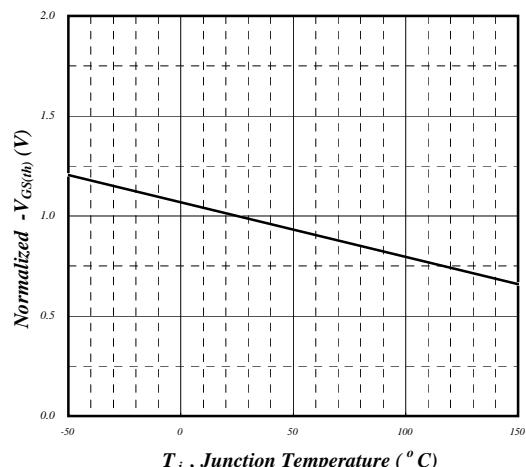


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

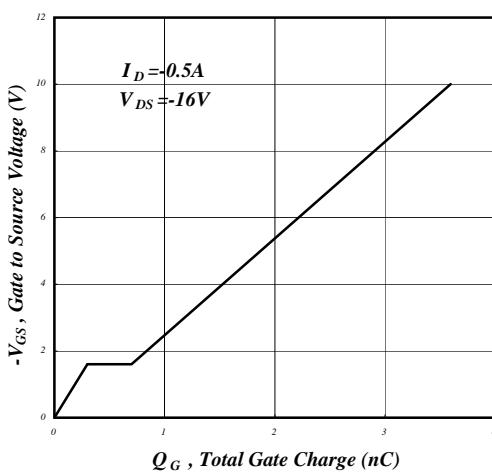


Fig 7. Gate Charge Characteristics

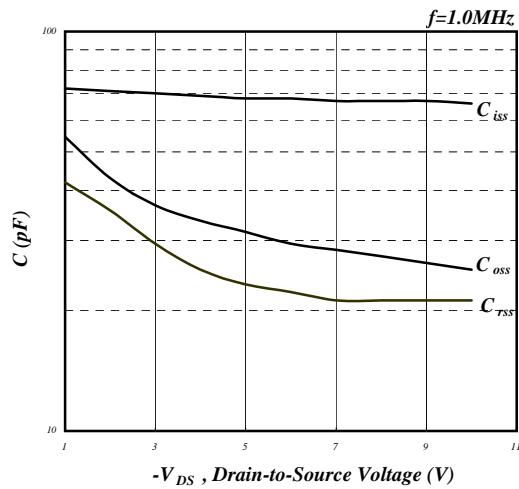


Fig 8. Typical Capacitance Characteristics

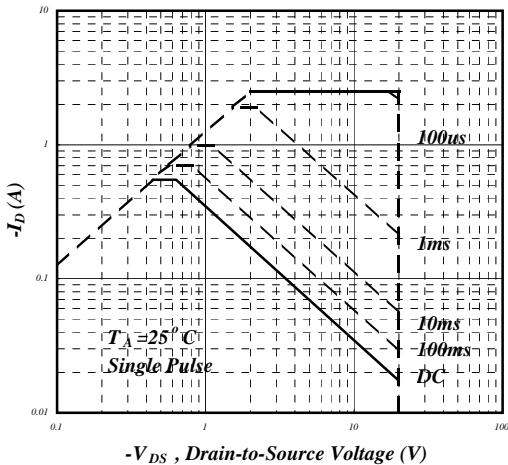


Fig 9. Maximum Safe Operating Area

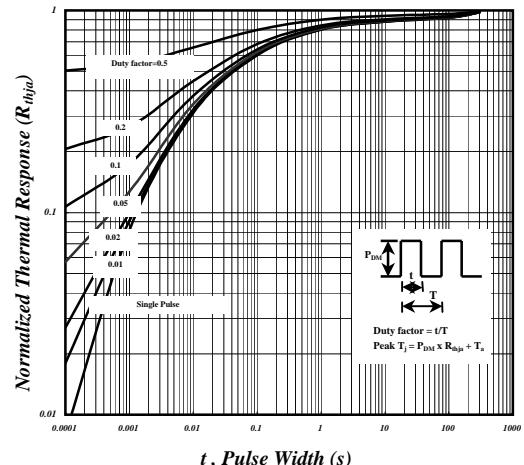


Fig 10. Effective Transient Thermal Impedance

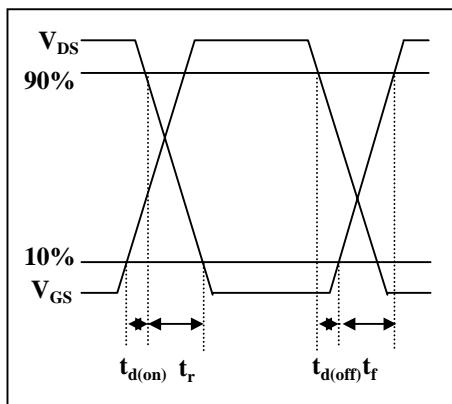


Fig 11. Switching Time Waveform

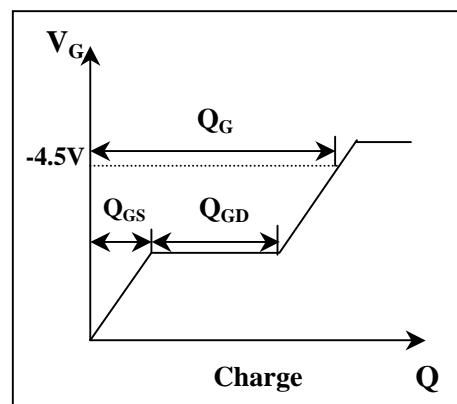


Fig 12. Gate Charge Waveform